# Foreign Direct Investment, Foreign Aid and Domestic Entrepreneurship

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ISBN 978-94-91870-16-3
Tjalling C. Koopmans Dissertation Series
USE 030
Printed by Ridderprint, Ridderkerk
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# Foreign Direct Investment, Foreign Aid and Domestic Entrepreneurship

Buitenlandse Directe Investeringen, Buitenlandse Hulp en Binnenlands Ondernemerschap
(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor
aan de Universiteit Utrecht
op gezag van de rector magnificus,
prof.dr. G.J. van der Zwaan,
ingevolge het besluit van het college voor promoties
in het openbaar te verdedigen op
donderdag 1 oktober 2015
des middags te 12.45 uur

door

Seçil Hülya Danakol
geboren op 10 november 1983 te Karabük, Turkije

Promotoren: Prof. dr. S. Rosenkranz
Prof. dr. U. Weitzel
Prof. dr. A. van Witteloostuijn

“If you can’t fly then run, if you can’t run then walk, if you can’t walk then crawl, but whatever you do you have to keep moving forward”

— Martin Luther King Jr.

This thesis is dedicated to me!

# Acknowledgements

"Life is like riding a bicycle. To *keep your balance*, you must keep moving."

— Albert Einstein

I was six when I first encountered the above quote, lacking the maturity to judge its significance. At the time it made sense, however, I was unable to test whether Einstein's statement is valid as my earliest experience of riding a bike ended with a car accident. It was after the move to the Netherlands that I discovered the fun of being on a bicycle. In the first week of my arrival, I felt like paralyzed in daily functioning without a bike. Although I could attend all the welcome events thanks to the incredibly patient and benevolent fellow students who carried me in the back seat everywhere, the need of adopting a bike dawned on me shortly. The subsequent weekend marked my triumph as I already rode twenty-five km with my very own pinkish bicycle suited for kids. I still have vivid memories of the fellow bikers in the Noorderplantsoen who were under three years old staring at me with surprised looks on their faces. They were possibly trying to comprehend why I was so late in learning to ride a bike, and why the bike was so tiny compared to my size.

Now that I am equipped with ten years of practise[1] as a biker, and in the world of the research for some time, I could not agree more with Einstein though with a slight change in his nomenclature: "*PhD* life is like riding a bicycle. To *keep your balance*, you must keep moving." I was ill-fated to have my five bikes stolen (also pinkish one) within one year after arrival in the Netherlands. Fortunately, my luck has turned around for the better as I was encircled by wonderful people who contributed to the completion of my thesis. I would like to thank and express my sincere appreciation to those who helped me to *keep my balance* and to advance in so many ways—both academically and personally during this exhaustive, but truly rewarding intellectual endeavour. Contributions come in various forms ranging from guidance to cooperation, friendship, encouragement, challenge, goodwill and understanding which made my research life in an enchanting city, Utrecht, utterly joyful and as free from strains as possible.

First, and foremost, having privileged access to the combined knowledge and expertise of three supervisors was a sheer luxury. I was one of those lucky PhD candidates,

[1]For those who wonder about my current biking abilities: there is still room for improvement. For instance, I can bike grasping the steering wheel with the right hand, and use the left one to signal turns. Strangely, I cannot do the opposite. Likewise, riding a bike with holding an umbrella over my head was not a good idea. Finally, I ceased the obstinate pursuit of being on a bakfiets after I stood at the brink of crushing three cars in less than five minutes.

thankfully! Nonetheless, co-supervision requires a proper balance and coordination of expectations of all sides, and the supervision process can be both an enriching and a challenging experience for the candidate. For me, it was much more the former since my supervisors complemented each other so well. *Stephanie Rosenkranz*, *Utz Weitzel* and *Arjen van Witteloostuijn*; I could not ask for a better combination of supervisors. I remember as if it was yesterday. Suffering from a heavy flue, I travelled from Groningen to Utrecht on a massively delayed train (as expected from the NS), and was just on time for the PhD interview. The discomfort provoked by the possibility of being late quickly faded away, and replaced with confidence and positivity as my (prospective) supervisors entered the room with a look of interest coupled with enthusiasm. The interview was anything but a formal meeting. Rather, the set up resembled a group discussion where we exchanged views and offered ideas with a goal of broadening each other's research perspective. The opportunity for voicing my each and every opinion was given no matter how trivial or wise they may appear. My viewpoints were respected and appreciated even when there was a scholarly disagreement. By the end of the interview, I knew that I was in the right place with the right people pushing me wholeheartedly towards my passion. *Stephanie*, *Utz* and *Arjen*; I am indebted for your unwavering commitment to me from day one till the end of my PhD journey.

My panel of supervisors also gave me enough freedom (often abundantly) to think independently, explore new territories and shape my own vision. Encouraged by such a favourable opportunity, I soon found myself drifting away from the original research idea. And here is the output! My thesis turned out to be fundamentally distinct from the initial scenario. *Stephanie*, *Utz* and *Arjen*; my heartfelt thanks for your support and respect to my choice to lead my thesis in a different direction while guarding me against falling into traps of my own creation.

Chapters 2 and 3 are joint works with *Utz* who has been a truly inspiring and motivating navigator throughout the years. It would be an understatement to refer to him as merely a supervisor, for he wore many hats during my project. From the supervision side, *Utz* acted as the glue to keep this project running smoothly by maintaining close coordination between the team members all based in different universities. For me, he is a man of practicality and wisdom. As hard as it is to accept, an exciting project involving months of hard work sometimes hits a deadlock. It is *Utz* who taught me that reassessing the situation and finding new ways to approach your work do not imply quitting the game; rather it just means putting your resources into more efficient use. During our many fruitful meetings, he frequently drew sketches consisting of lines and arrows to reflect the relationships among themes, ideas and concepts being discussed, which I found very effective in getting the message across. I am thankful to *Utz* for expanding my awareness that meeting sessions with supervisors not only to evaluate the candidate's progress but also to set a direction for the research through thought-provoking discussions. *Utz*, you put

complete trust in me and my abilities, stood by my side with never-ending support and patient over the years, I sincerely hope that this thesis does justice to you.

This thesis would not have been possible without the strong involvement and backing of *Stephanie* and *Arjen*. They always set aside time for me from their densely-packed schedules, even on a short notice. I remember meeting with *Stephanie* a couple of times at her house on days when she is supposed to be free from work commitments. *Stephanie*, I am thankful to you for being always available with the right solution and smart approach when I needed your advice. Although deeply shameful, I once mixed up the date of my appointment with *Arjen*, and did not show up at the meeting. He was extremely tolerant of this humanly mistake but I would not recommend any PhD candidate to commit such an offence. *Arjen*, thank you for your understanding; since this incidence I became much more diligent in reviewing my calendar (I think I am close to the German standard now). The meetings with (both of) you always helped me to put things in perspective and inspire me to focus on the big picture when I was bogged down in details. I am grateful to both of you for honing my skills to look at parts and see how they make up a whole. Since I know *Arjen* from my master studies, I am still amazed by his dedication to the students. He was travelling all the way from the south to Groningen to teach a group of only five students. Likewise, *Stephanie* always keeps an eye on the students even when she is not physically around. Our regular Skype talks during her sabbatical helped me to keep on track in her absence. *Stephanie* and *Arjen*: I am beholden to you in every possible way, and I sincerely hope that I have made all your efforts worthwhile.

One of the most memorable periods during my PhD trajectory is the intense collaboration with *Saul Estrin* from the London School of Economics. It was a fantastic four-month period, during which I engaged in productive research culminated in Chapter 2 of this thesis. I would like to convey my profound gratitude to *Saul* for providing me with the opportunity to visit the LSE and benefit from his comprehensive expertise. Our insightful discussions—often held in the Lincoln's Inn Fields in an informal setting not only sharpened my research skills but also broadened my vision on some key issues related to my thesis. *Saul* has never run out of thoughtful and encouraging words anytime I needed during my stay in London. He generously let me occupy his office where I enjoyed working on a two-screen computer. Hence, scrolling through Facebook now and then became an easy source of distraction. I am also thankful to fellow PhD students on the fifth floor for their warm welcome, friendship, and coffee breaks. My visits to the PhD corner on the fifth floor was the gateway to vibrant and interesting chats whenever I felt isolated and when things got too overwhelming. Noteworthy are the discussions I had with *Samer* on entrepreneurship in Africa, particularly in Southern Sudan.

My special thanks go to the thesis committee members, prof. dr. *Steven Brakman*, prof. dr. *Joris Knoben*, prof. dr. *Hans Schenk*, prof. dr. *Erik Stam*, and dr. *Burak Uras*. I am indebted for your detailed and constructive comments on the dissertation. Next, I would

like to extend my appreciation to *Paul Reynolds* for his irreplaceable contribution to Chapter 2.

Over the years, many of my colleagues and friends at USE contributed to the success of my work in a variety of ways including support, insights and laughs. *Bahar*, thank you for the (very) long and pleasant chat we had in the lovely garden of Janskerkhof 12 soon after you started working at the department. It was an eye-opening experience. I always enjoyed sharing children books and going over the content with you whenever you wanted to refine your Turkish language skills. Also, our cooperation in sorting out all kinds of IND-related red tape was a real fun. As a person who is hardly a meat enthusiast, I am grateful to *Lu* for helping me begin my very own sushi adventures. Your suggestions on how good coffee should taste are also much appreciated. Besides, you have been a colourful running companion in the Wilhelminapark, with whom I could discuss much more than research. *Ioana*, with your good sense of humour, art of conversation and sunny disposition, the room 2.07 has always been an energetic and a fun habitation. I like to thank you for increasing the green area per inhabitant by bringing the good luck tree to the office so that we had more oxygen available. Most importantly, you took good care of my little plant during my stay in London, which perished after I was back. Once again sorry for that! *Jasper*, I appreciate all work- and non-work-related discussions we had, and thank you for lending your advanced math skills when needed most, even on a short notice. *Emre*, I would like to express my special thanks for your valuable comments on Chapter 5. While we often disagreed on many issues, discussing Turkish politics with you has also been an enriching practise. Finally, I would like to thank my officemates, *Joras*, *Lin Lin*, *Martijn*, *Ryan* and *Yi*, for their company, and for providing a friendly and supportive research environment.

*An* and *Sarah*; I am very happy to have you as my paranymph at such a special day. I always knew that my name is hard to pronounce and is not easily understood. Nevertheless, it still felt strange to be tagged as the black-haired girl on the very first photo added by *An* on Facebook. Fortunately, initial impressions are swiftly shattered. *An*, even though we did not share the same office for very long I am glad that our friendship kept growing. Thank you for giving me a helping hand with my heavy boxes when my bike refused to move, for sharing delicious food when I felt hungry on late working days and for giving tips about make-up (which I am apparently not successful in yet). *Sarah*, I am sincerely grateful to you for taking care of all the administrative matters and procedural aspects of the manuscript in my absence.

My various other friends outside the department deserve credit for making my journey both easier and more enjoyable. *Selvi*, thank you for being my sister whom I can count on all the time in any situation with my eyes closed, and for teaching me that everything is meaningful with its contrary. *Funda*, I still have fond memories of our regular La Fontana dinners packed with long and pleasant chats. You are a great friend with a huge heart. *Natasja*, your visits to both Utrecht and London along with our weekend

breaks have been really gezellig and often helped me put the usual PhD stress behind. *Çiğdem*, thanks for taking long and peaceful walks with me. *Chris*, you have been the sole person enduring the brunt of my thesis-related mood swings; thank you for putting up with me and being my other half during the PhD process.

Canım annecim *Sebahat* ve babacım *Sefer*,

Verilen onca emek, fedakarlık ve uykusuz gecelerin karşılığında tezimi başarıyla tamamlamış bulunmaktayım. Bu zorlu ama bir o kadar da keyifli geçen yolculuğun görünmez, gerçek kahramanları hiç şüphesiz ki sizlersiniz. Doktora hayatım boyunca bana vermiş olduğunuz koşulsuz destek, sabır, anlayış, güven ve inancınızdan dolayı size ne kadar teşekkür etsem hakkınızı ödeyemem. Küçüklüğümden beri bana hayallerimin ve hedeflerimin peşinden gitmeyi öğütlediniz. Bu uğurda anne baba olarak, hiç şikayet etmeden, yerine getirebileceğinizden çok daha büyük sorumluluklar altına girdiniz. Gün gibi aşikar; ulaştığım başarıların baş mimarı sizlersiniz. Uzun süredir yuvamdan uzak olmama rağmen eşsiz varlığınız her zaman bir el dokunuşu kadar yanımdaydı. Şimdiye kadar sizin ışığınız altında yönümü tayin ettim. Bundan sonrası içinde hayatıma nasıl bir yön verirsem vereyim siz benim yegane pusulam olacaksınız. Biliyorum ki, takılsamda, düşsemde o sevgiyle yoğrulmuş bakışınızla hep yanımda olacaksınız. Annecim ve babacım; bana harcadığınız emeğin ve zahmetin karşılığını hiç bir şekilde ödeyemem. Ama yinede umarım doktoramı muvaffakiyetle tamamlamış olmam size olan gönül borcumun küçükte olsa bir karşılığı olur. Sizi çok seviyorum.

Değerli abicim *Sedat*, *Sevgim* ve minik sevgi pıtırcığım *Ardam*; bu süreçte bana vermiş olduğunuz destekten dolayı sizlere çok teşekkür ediyorum. Ailecek mutlu, huzurlu, sağlıklı ve başarılarla dolu uzun yıllar bizimle olsun.

Seçil Hülya Danakol
6 September 2014
London

# Contents

# List of Figures

# List of Tables

# Chapter 1 : Introduction

## 1.1. Introduction

Without an opportunity, there is no entrepreneurship. Audretsch (1995) argues that opportunities for entrepreneurs emerge as the outcome of deliberated actions such as research and development (R&D) investments and other knowledge creation efforts by incumbent firms when these firms are unable to fully make use of the new knowledge. However, Audretsch (1995) does not distinguish between domestic and foreign firms. On the one hand, foreign firms usually undertake more innovative activities than local firms, and transfer technology from abroad. Due to public good characteristics of knowledge, new opportunities for entrepreneurs may be formed in the local economy. On the other hand, foreign firms are interested in their own economic goals, may exploit monopoly power and protect their proprietary assets such as technological know-how more effectively (Navaretti and Venables, 2004). There may not be much room for entrepreneurial opportunities after all. The fact that foreign direct investment (hereafter FDI) can do both harm and good to entrepreneurship (De Backer and Sleuwaegen, 2003) leads to an interesting question which has not been systematically explored in the existing empirical literature: How does FDI affect domestic entrepreneurship in host countries? This thesis is designed to answer this question.

FDI as a source of opportunity for entrepreneurship has received far less attention in the literature investigating the determinants of new business formation (Acs et al., 2007; Meyer, 2004; Spencer, 2008). We can view FDI as an external factor influencing entrepreneurship, similar to institutions or aggregate economic conditions, which not only create the opportunity, but also determine the scope of economic gains attached to the opportunity.

This is in stark contrast to the individualistic view on entrepreneurship which tries to explain differences based on personality characteristics. Namely, the individualistic view takes the available opportunities as a given (Wenneker et al., 2002). According to this view, entrepreneurs have a different cognitive process in recognizing opportunities compared to the rest of the population. Once the opportunity is recognized, he or she acts upon it if the benefits outweigh the costs associated with the entrepreneurial act. Therefore, opportunity recognition is seen as sufficient to expend effort in a new business creation, one from which other phases of entrepreneurship often follow.

However, the individualistic view has been challenged when variations in entrepreneurship across industries, regions and countries could not be explained adequately by individual level differences (Cuervo, 2005). Research efforts have been directed toward external factors such as institutions or macroeconomic conditions that might explain why entrepreneurship takes place. For example, Baumol (1990) argues that the allocation of entrepreneurial talent across diverse operations is determined by the relative payoffs of pursuing each activity which are in turn based on the institutional context. With diverse operations, he refers to the presence of opportunities created by the institutional context that entrepreneurs can engage in. In simple terms, Baumol (1990) suggests that institutions affect the demand side of entrepreneurship by generating opportunities and determining the payoff structure. On the supply side, institutions are also critical in encouraging entrepreneurial capabilities and preferences (Verheul et al., 2002). For example, the supply of entrepreneurs and their characteristics can be influenced through education or training programs targeting particular groups such as women, youths and the unemployed.

We argue that the effects of FDI on entrepreneurship can be viewed as comparable to those of external factors, for example institutions, as foreign firms affect both the demand and supply side of it. First, on the demand side, a foreign firm's presence is an external condition and has the function of generating opportunities in the local economy. The latter arises because FDI brings capital, management skills and new technologies facilitating knowledge spillovers. Second, it is also a source to determine the payoff structure or more precisely, the level of profit of a market opportunity. This can be achieved in two ways; both by raising the initial cost of setting up a business and by affecting the subsequent earnings potential. To begin with, foreign and domestic firms compete in local factor markets where the former may attract a significant amount of domestic endowments (e.g., finance, managerial and skilled labour), and thereby raising the cost of new firm entry. Large start-up costs may not only impede entry which otherwise would have taken place in increased rates, but also erode the expected future returns. Extended periods of time are often required to cover large entry costs, which may block the development of enterprises and reduce the likelihood of its survival. Since a large proportion of firms fail during the start-up phase, a potential local entrepreneur having a business idea stemming from foreign knowledge may not proceed with the development and commercialization of the opportunity if the probability of success is perceived insufficiently high in generating revenues to offset high start-up expenditure. Next, similar to factor markets, large FDI presence in host economies is often associated with heightened competition in product markets owing to, for instance, the availability of better quality products and services with increased variety at a lower cost. Thus, even in the presence of sufficiently small entry costs inducing new firm creation, foreign firms may put downward pressure on profit mark-ups, and consequently dampen new investment incentives of prospective entrepreneurs.

In pursuit of an opportunity, a potential entrepreneur assesses whether there are positive expected net present benefits of firm creation once all the costs and risks of the project are accounted for. Rigorous markets analyses are generally part of the feasibility checks. Nonetheless, the overall evaluation of a business idea is oftentimes subjective based on the entrepreneur's abilities, knowledge, experience and judgement. Upon this evaluation of the benefits and risks, even though the former involves greater value, a would-be entrepreneur may be inclined to work in a foreign firm due to the security of high wage employment while avoiding the variability and volatility of self-employment earnings. In their survey, Van Praag and Versloot (2007) report that entrepreneurs have lower median incomes that are more volatile and less secure than salaried jobs. Hall and Woodward (2010) reach a similar conclusion in their theoretical framework. On the supply side, foreign firms train local employees in technological know-how and management skills, and this increases the stock of human capital. In this way, foreign firms may act as a training ground for prospective local entrepreneurs.

Compared to the effects of other environmental determinants of entrepreneurship, for example, institutions (see, Aidis et al., 2008) and macroeconomic conditions (e.g., unemployment) (see, Audretsch et al., 2001), FDI presence has received limited attention (Acs et al., 2007). One reason for this could be the lack of an adequate framework that integrates various channels through which FDI can affect domestic entrepreneurship (Ayyagari and Kosová, 2010). Görg and Strobl (2005) refer to existing empirical studies as a black box which has not adequately considered different channels driving the FDI-entrepreneurship nexus. However, this is not an easy task because it requires detailed data, preferably with a time dimension, that is difficult to obtain. Furthermore, FDI is heterogeneous in nature and undertaken for different reasons (e.g., market access, efficiency-seeking). Similarly, the mode of entry adopted by foreign firms varies, such as

greenfield and mergers and acquisitions (M&A), which also necessitates disaggregated data if one wants to rigorously and systematically unpack the effects of FDI on domestic entrepreneurship.

Foreign firms change the dynamics of the industry in which they operate (Navaretti and Venables, 2004). Hence, one might argue that the implications of FDI are comparable to the effects of industry structures on entrepreneurship which have been extensively studied (see, Geroski, 1995; Mata, 1993). These studies, however, largely fail to distinguish between the sources of changes in the industry stemming from foreign versus domestic firms. This distinction is important because, as Navaretti and Venables (2004) argue, foreign-firm-based-competition is often different from domestic-firm-based-competition as the former is equipped with more resources and may opt for more aggressive competitive strategies. Therefore, empirical studies linking industry characteristics to entrepreneurship offer little insight into the FDI-entrepreneurship nexus, and hence, more empirical work is necessary.

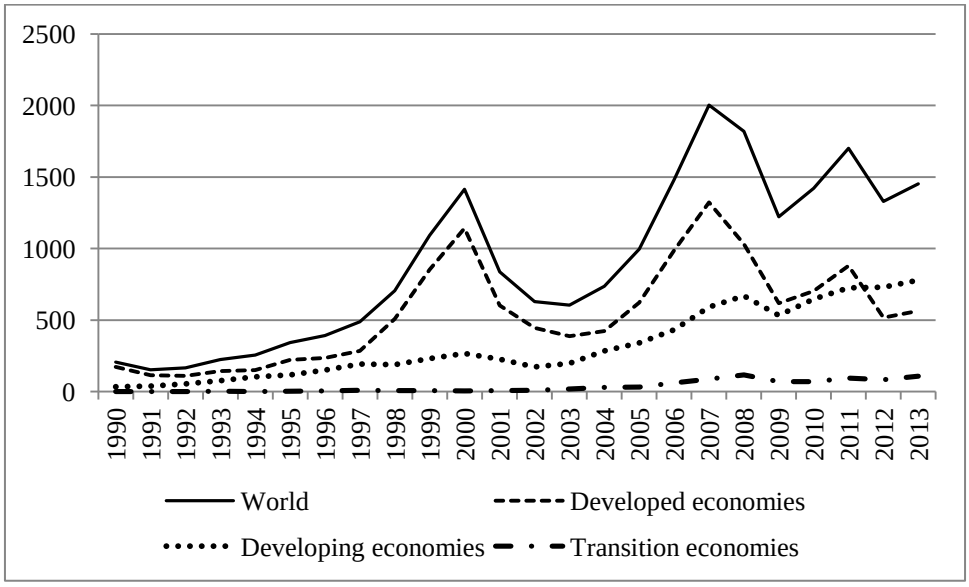
In recognizing the critical role of entrepreneurship in economic development, the first aim of this thesis is to take up some of the empirical challenges discussed above and to unpack the underlying dynamics of the FDI-entrepreneurship nexus. Second, while FDI is attracted to both developed and developing countries, inflows to the latter are heavily concentrated within a small number of economies. Unable to lure foreign investors, many lower-income countries remain dependent on foreign aid as a financial foundation for development. This indicates complementarities between aid and FDI which have gained prominence in recent years both in policy debates and academic research. Furthermore, during the last decade large scale aid inflows were channelled into policy reforms aimed at entrepreneurship development. The question that then arises is whether this policy shift has any real impact on entrepreneurial endeavours in aid-receiving countries. The direction of the effect is not clear ex ante; rather it depends on how efficiently aid flows are utilized. While reforms are aimed at fostering entrepreneurship, misuse of flows due to rent-seeking practices may result in undesired effects. The empirical literature to a large extent neglects this link. Therefore, the second aim of this thesis is to assess the role of foreign aid flows in entrepreneurship development.

The worldwide FDI and foreign aid flows are illustrated in Figures 1-1 and 1-2, respectively. We can see from Figure 1-1 that global FDI inflows maintained a steady growth over the period 1991-2000 reaching a cumulative total of $495 billion, with notable increases in the last three years. Inflows into developed countries were the largest contributor accounting for, on average, 69% of the total during this period while the corresponding figure for developing countries is 30% leaving the share of transition economies negligible. What we can also observe is the sharp fall in the value of worldwide FDI in 2001; by 41% in 2001 to $838 billion, which is followed by two further slumps of 25% and 4% in 2002 and 2003, respectively. This three-consecutive-year drop of inflows was the first since 1991. More specifically, the sharp decline in 2001 was uneven across country groupings with developed countries having borne the brunt of the 47% downturn in inflows, from $1 142 to $603 billion in absolute values. Crucially, Figure 1-1 draws our attention to economies in transition as they attracted more FDI inflows each year since liberalization began in the early 1990s. Of particular interest is that this group did not experience a fall in inflows in 2001-2003 which is in direct contrast to the experience of their developed and developing counterparts.

Similar to trends in the late 1990s, global FDI soared in the pre-crisis period of 2004-2007. Despite the financial crisis that erupted in the second half of 2007, this year marked four consecutive years of growth in inflows with a 35% surge to reach $2 002

billion, well above the previous all-time high, set in 2000. During the pre-crisis period, all the three economic groupings, developed and developing countries as well as economies in transition, saw their inward FDI surge reaching their highest level of $1 323, to $591 and to $88 billion, respectively. Accordingly, developed countries maintained their lead in the period 2004-2007.

**Figure 1-1:** FDI inflows, by region, 1990 - 2013 (billions of US dollars)



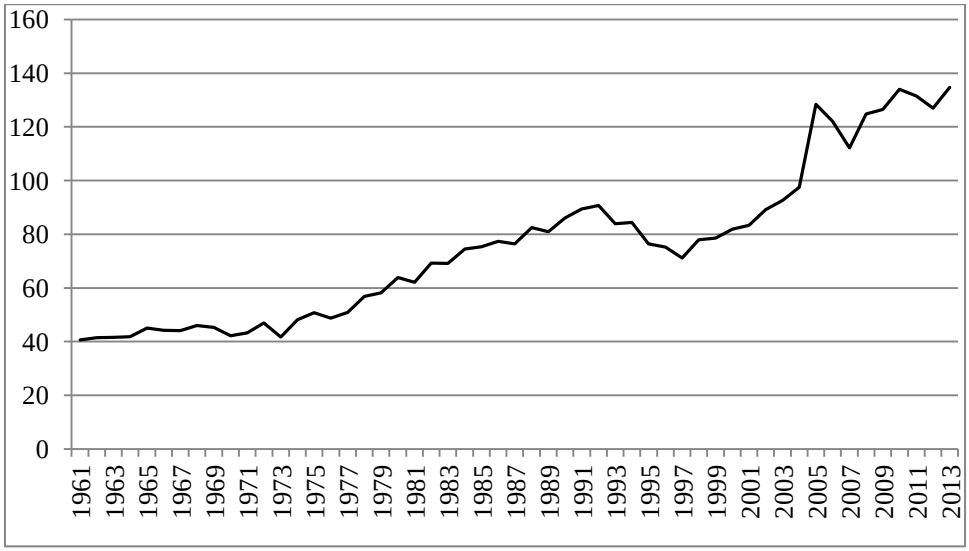

*Source:* United Nations Conference on Trade and Development (UNCTAD), FDI/TNC database (www.unctad.org/fdistatistics).

Reflecting the repercussions of the economic crisis, global FDI inflows experienced a decline of 9% in 2008, due to the downturn in developed countries where the crisis originated. In contrast, inflows in developing countries and within economies in transition continued to increase in the same year. The differential impact of sharpening economic crisis on the three major economic groupings ended in 2009 when they all saw their inward FDI decline causing a drastic fall of 33% in global inflows. This was followed by a slight recovery in 2010 and 2011 but, global FDI was still well-below its pre-crisis peak value realized in 2007. The year 2012 is noteworthy because for the first time, developing countries absorbed more FDI compared to developed ones taking a 54% share of global inflows. However, this is mainly due to a slump in FDI in developed economies rather than a corresponding surge within their developing counterparts. Likewise, developing economies retained their lead in 2013.

Figure 1-2 shows aid flows for the period 1961-2013. With a starting value of $40.66 billion in 1961, aid flows remained relatively stable in the period of 1961-1973. The cumulative total was $564.20 billion with an average growth rate of 0.36% during this period. Following this steady phase, over the next two decades aid flows increased peaking at $90.66 billion in 1992 with flows growing on average by 3.56% during 1974-1994. We can see this pattern reverses during the next three years where foreign aid declined to $71.18 billion in 1997, a value less than the figure realized in 1984. After this downturn, aid rebounded again with a marked surge in 2005 to $128.41 billion in absolute terms or growth of 32% compared to 2004. The pre-crisis period, 2006-2007, coincides with a decline in aid, only to experience a revival in the following three years. Despite the continued pressure from the economic crisis on the budget of donor countries, aid flows

reached their highest recorded level in 2013 at $134.7, marking a recovery period following the previous two years of decline.

**Figure 1-2:** Foreign aid inflows 1961 - 2013 (billions of US dollars)




*Source:* Organisation for Economic Co-operation and Development (OECD) (www.oecd.org/aidstatistics)

The remainder of this chapter is structured as follows. Next, we discuss alternative definitions of entrepreneurship as well as its determinants and economic consequences in order to grasp the bigger picture regarding the current state of entrepreneurship research. Sections 1.3 and 1.4 address the theory behind FDI and foreign aid in relation to entrepreneurship, respectively. While section 1.5 is reserved for the discussion of empirical evidence on host country effects of FDI, the chapter concludes with section 1.6 which outlines the structure and contributions this thesis.

## 1.2. Theory on Entrepreneurship

This section first deals with the definitional and conceptual issues surrounding entrepreneurship. We subsequently address the factors determining the level of entrepreneurship as well as its consequences. Entrepreneurship is a multidimensional concept but we follow the mainstream, and define it as the organization of various resources to create a firm, and the focus in this thesis is on new, young and small businesses in line with Van Praag and Versloot's (2007) definition.

***Entrepreneur (ship): Creative-destructor, Risk-bearer, Innovator***

Defining entrepreneurship is subject to debate among scholars and policy makers due to the diversity in characteristics associated with this phenomenon (Parker, 2009). Within the realm of economic theory, views on what constitutes entrepreneur and entrepreneurial activity are scattered and numerous, being expressed by prominent economists. Richard Cantillon, who is among the first-wave thinkers, conceptualizes the entrepreneur as a risk-bearer buying goods at certain prices and selling them at unknown prices with some uncertainty. Therefore, this vision underscores the profit motive of economic agents. While Jean-Baptiste Say's entrepreneur has exceptional ability to create new enterprises and combine the factors of production with an aim of generating greater yield, the theory of John Stuart Mill separates entrepreneurs from other business-related people (e.g.,

managers). In the subsequent framework established by Frank Knight, echoing Cantillon, the entrepreneur faces computable business risk, of which he is aware, and the severity of this type of risk can be reduced through the execution of planned actions. Knight's entrepreneur also tries to remove uncertainty as much as possible but uncertainty, which is inherently immeasurable, will always exist in market transactions. Therefore, entrepreneurial performance hinges on proper and efficient management of unknowable uncertainty rather than calculable risk.

Of all the theories of entrepreneurship, Joseph Schumpeter's proposition has probably gained the most recognition. The Schumpeterian entrepreneur acts as a 'creative destructor' who drives innovation through new combinations of ideas and resources (e.g., new, superior goods and services, and enhanced production techniques). Finally, as Israel Kirzner sees it, entrepreneurship is a process of discovery. Kirzner's entrepreneur is unique in his capacity to notice profit opportunities and initiate actions to exploit them.

Along the spectrum of entrepreneurship, individuals are considered as business owners, creative destructors and innovators, engaging in market transactions by coordinating the factors of production and exploiting profit opportunities in the face of uncertainty, and bearing risk. Entrepreneurship is multifaceted, and synthesizing these domains into a grand definition has proven to be a difficult task. Accordingly, available measures reflect particular aspects of entrepreneurship, while marginalizing other dimensions. Most existing studies capture entrepreneurial activity through one of the two measures: self-employment and new firm formation (Parker, 2009).

In theoretical models, self-employment is conceived as an occupational choice. In the simplest framework, individuals choose between entrepreneurship and wage-employment, and the decision is in favour of the alternative with the highest monetary value (Parker, 2004). However, this basic set-up cannot answer the interesting question of 'who becomes an entrepreneur?' as it fails to reflect the characteristics of such individuals. Later designs by Lucas (1978) and Kihlstrom and Laffont (1979) address this issue by taking into account the heterogeneity in entrepreneurial ability and risk aversion, respectively. The authors show that the least risk-averse and most able persons are more likely to self-select into entrepreneurship, and own larger enterprises. What constitutes entrepreneurial ability is not clearly defined in the first study but, it might reflect, for example, leadership qualities (Leibenstein, 1968) or judgment (Casson, 1982).

Another strand of work considers switching costs between occupations, for instance, individuals are assumed to shift to self-employment once the expected payoff is higher compared to wage rates (or vice versa). However, in real life, changing jobs involves costs, both monetary and non-monetary, such as initial capital requirements (for entrepreneurship) or the loss of favourable working environment (for paid-employment). Dixit and Rob (1994) demonstrate that individuals prefer to remain in their current occupation even though it is not financially attractive any more. Namely, higher switching costs deter movement. Expectations that the conditions of the present occupation will improve also prevent individuals from switching. Finally, Evans and Jovanovic (1989) and Parker (2000) relate the decision to be self-employed to borrowing constraints. The main conclusion is that borrowing constraints are binding, and would-be entrepreneurs are discouraged from undertaking new business projects.

Self-employment is an individual level proxy for entrepreneurship. It is widely used in empirical research due to the broad availability and similarity of definitions across countries and years (Audretsch, 2003). The OECD Labour Force Statistics consider individuals as self-employed if remuneration is tied to business profits and the entrepreneur retains personal liability for the debts and obligations of the enterprise. Under this

definition, Iversen et al., (2008) argue that the self-employed persons resemble the Knightian entrepreneur who is conceived as a bearer of uncertainty, and assumes business hazard. Along with the profit motive, the OECD description of self-employment is also associated with the discovery and exploitation of business opportunities in accordance with Kirzner's conception of entrepreneurship. One disadvantage of this indicator is that self-employed individuals constitute a very diverse group engaging in productive activities which are not necessarily innovative (Earle and Sakova, 2000). Available data on this measure counts all self-employed equally, and it is implicitly assumed that the contribution to the innovative activity is uniformly distributed. However, self-employment often occurs due to a lack of employment opportunities—out of necessity which may not be characterized as innovative and entrepreneurial. As such Parker (2004) claims that the self-employed hardly bear the stamp of Schumpeter's innovative entrepreneur. Finally, an important aspect of self-employment data used in empirical (cross-country) studies is the exclusion of the agricultural sector. This procedure is justified by factors pertinent to the farming business including the excessive reliance on subsidies, the widespread incidence of family ownership and high shares of unpaid family labour (Blanchflower, 2000).

In contrast to self-employment, new business formation is a firm level proxy for entrepreneurship. One apparent shortcoming of this measure is that national statistics are not fully standardised in terms of definitions which restricts its use in cross-country studies (Gartner and Shane, 1995). New firm entry is viewed as more entrepreneurial and innovative than self-employment, capturing the dynamic nature of economic activities (Iversen et al., 2008). It represents a process by which entrepreneurs gather and reallocate various resources more efficiently. In turn, business ideas are transformed into market opportunities leading to the commercialization of new products and services. Consequently, start-ups challenge and supplant existing firms that are less efficient, along with putting competitive pressure on the surviving ones. As such, new firm entry is closely associated with Schumpeter's creative destruction process which refers to—broadly speaking a mechanism whereby innovations disrupt obsolete technologies (Parker, 2009).

Another distinction in entrepreneurship measures can be made based on the registration status of enterprises: formal and informal entrepreneurship. The former involves firms that obtain the necessary permits from the relevant government departments to do business. In contrast, informal entrepreneurship refers to business formation without official licenses where entrepreneurs avoid paying registration fees and taxes (Desai, 2009). Furthermore, a differentiation is also possible by the type of activities undertaken. While most entrepreneurs engage in legal activities sanctioned by the state, illegal entrepreneurship (e.g., organized crime, mining in prohibited areas) also takes place (Aidis and Van Praag, 2007).

Besides the aforementioned proxies, alternative measures of entrepreneurship include indicators of R&D activity, number of patents, new product and service innovations introduced into the market, density of firms and turbulence (entry plus exits) (Audretsch, 1995).

### *Determinants: Individual-level Factors*

There are two lines of research trying to explain why variations in entrepreneurial activity occur across countries and regions. The first explanation focuses on the individual. According to this view, there are certain psychological traits and personal characteristics which distinguish entrepreneurs from the rest of the population, and it is these attributes that predispose them to entrepreneurship. In his seminal work, McClelland (1961) argues that societies with greater motivation to achieve produce more entrepreneurs. Since then,

*the need for achievement* has largely been associated with entrepreneurial activity as individuals scoring high in this factor are characterized by setting higher goals, valuing feedback on their performance and constantly seeking for advancement. Second, *self-efficacy* or in particular *entrepreneurial* s*elf-efficacy* is also seen as a distinct entrepreneurial entrepreneurial trait (Chen et al., 1998). This trait refers to a person's belief in his or her capabilities to successfully perform an activity and a person's belief regarding whether or not certain goals may be achieved (Bandura, 1977). Upon self-assessment, people tend to choose occupations in which they feel competent and avoid the ones in which they doubt their capability to be successful. With regard to entrepreneurship, an individual's self-efficacy beliefs regarding the prospects of failure or success in specific tasks of entrepreneurship will subsequently affect the development of entrepreneurial outcomes (Boyd and Vozikis, 1994). Third, entrepreneurship and risk-taking areinextricably linked (see, Knight 1921), as entrepreneurs invest today whilst awaiting return on their investment, which involves a high degree of uncertainty. Consequently, *risk taking propensity* is another psychological trait which is believed to affect the selection of individuals into entrepreneurship. As Kihlstrom and Laffont's (1979) model of entrepreneurship demonstrates entrepreneurs are less risk averse than salaried employees. Another trait, closely related to entrepreneurship is the desire for *autonomy.* The decision making process of entrepreneurs involves no direct supervision, goals are set independently and the route to success is planned by the entrepreneur (Lumpkin et al., 2009). Individuals with high autonomy orientation have greater discretion over the work process, want to be in control and thus choose an entrepreneurial role (Cromie, 2000). This brief review of personality traits is non-exhaustive, as research continues into this topic. A review of several studies reveals that entrepreneurs have a high internal locus of control (Rotter, 1982), a high tolerance for ambiguity (Blume and Covin, 2011; Schere, 1983), a high need for dominance (Cuervo, 2005), with a low need for conformity and support (Zhao et al., 2010), and, are over-optimistic and over-confident (Arabsheibani et al., 2000; Lowe and Ziedonis, 2006).

Next to psychological traits, the endowment of different levels of human capital might explain why some individuals choose entrepreneurship. Human capital refers to the stock of knowledge and skills embodied in individuals (Becker, 1964; Mincer, 1974) and it includes attributes such as education, age, training, employment experience, start-up experience, owner experience, and parental background. First, through education, individuals may develop various skills such as problem solving, discipline, motivation, self-confidence and critical thinking that are associated with entrepreneurship (Ucbasaran et al., 2008). Entrepreneurship may also be boosted through education because highly educated individuals are better informed about business opportunities (Cuervo, 2005). Second, based on previous experience, individuals can also acquire industry-specific knowledge, establish a reputation, and build social networks which serve as sources of capital and market information, and gain managerial skills, all of which might eventually be used in a new venture (Kim et al., 2006). Third, age tends to bring experience and resources, this can include capital through employment, inheritance or other investments alongside organizational skills accrued over time which could be used to start a new company. Yet, an associated disadvantage is that older people may avoid risk taking and spend less time at work, which can constrain entrepreneurship (Parker, 2004). Finally, individuals are more likely to become entrepreneurs if their parents owned a business. Parental influence is suggested as a driver encouraging offspring to value self-employment more than regular employment. Furthermore, self-employed parents may transfer valuable skills needed to coordinate activities in setting up a business, provide capital and introduce them to business networks (Cooper et al., 1994).

***Determinants: External Factors***

Two alternative scenarios have been proposed regarding the effects of the macroeconomic climate on entrepreneurship. On the one hand, the *pull hypothesis* posits that there will be an increase in new business activity, if economic conditions are more favourable. Individuals tend to enter entrepreneurship when demand is high and less volatile, and when they expect that economic conditions will remain stable. It is argued that in such conditions profit opportunities are widely available to the entrepreneur. Under this scenario, increases in entrepreneurial activity would accompany high rates of GDP growth, low interest rates, high inflation rates, high new plant and equipment expenditure growth and decreases in the unemployment rate (Cuervo, 2005).

On the other hand, the *push hypothesis* argues that a downturn in economic conditions would stimulate new venture creation by reducing the opportunity cost of being an entrepreneur. Although in times of recession business opportunities are not very compelling, entrepreneurs may recognize niche markets to enter. As firms close down in recessions, there will be an abundance of low-cost labour and affordable capital equipment which reduces entry barriers. Under this perspective, low growth rates of GDP, low inflation rate and high interest rates would lead to an expansion in entrepreneurial activity (Parker, 2004).

As part of overall economic conditions, availability of, and access to, finance is a critical ingredient for entrepreneurship because some up-front investment is required to establish a new firm. Due to asymmetric information and market frictions, however, entrepreneurs with borrowing needs are often unable to obtain sufficient funding or any funding at all (Sternberg and Wennekers, 2005). Misallocation of funds in the form of credit-rationing or under-investment may occur as investors often face difficulties in evaluating the business prospects and the moral character of the entrepreneur. This in turn may deter entrepreneurs with good ideas from entering markets. This is the basic insight of the well-known Evans and Jovanovic (1989) model where the authors demonstrate that borrowing constraints discourage entrepreneurship.

Additionally, the level of entrepreneurship is affected by certain elements pertaining to an industry. Entrepreneurship occurs in response to combinations of profit opportunities and the level of entry barriers (Parker, 2004). The industry-specific factors include expected profitability, capital and R&D intensity, the innovative capacity, product differentiation, market size and growth rate, concentration rate, minimum efficiency size of the incumbent firms as well as their strategic behaviour towards the entry of potential competitors (Shane, 2000). For example, it is less reasonable to assume that individuals set up new businesses in industries dominated by large, capital-intensive firms as the latter group have a comparative advantage. However, as argued by Wenneker et al., (2002) technological progress in the last decades drastically diminished transaction costs and lowered minimum efficient scales in many industries. This process creates new opportunities for entrepreneurs in sectors previously dominated by large firms, and opens new markets.

Besides the economic environment, it is suggested that there are a variety of institutional factors that enable or disable entrepreneurial endeavour. North (1990, p:3) defines institutions as “the rules of the game in a society or, more formally …humanly devised constraints that shape human interaction” which include laws, rules, regulations, norms and beliefs, culture and so on. Among these, secure property rights and the rule of law are particularly conducive to entrepreneurial development. The reasoning behind this is the same as linking these institutions to economic growth and development (Acemoglu and Johnson, 2005). Namely, an effective protection of property rights and the rule of law

prevent rent-seeking behaviour by private parties and those who control the state, as well as reduce uncertainty and transaction costs. Entrepreneurs who make investment decisions in the face of uncertainty are very sensitive to these factors when exploiting business opportunities (Baumol, 1990). Similarly, in the absence of strong legal institutions, investors are not adequately protected and as a result new business ideas, that are inherently risky, are less likely to be financed. Finally, government regulations on taxes, firm entry, personal bankruptcy, and creditor rights are important for entrepreneurship (Cullen and Gordon, 2007). For example, tax rates determine the available economic rewards on entrepreneurship with firm owners paying substantial taxes on profits under progressive tax policies.

Along with formal institutions, culture which is defined as a set of shared values, beliefs and expected behaviours (Hofstede, 1984) also influences entrepreneurship (Hayton et al., 2002). Davidsson (1995) puts forward that cultures promoting and rewarding entrepreneurial traits such as the need for achievement, autonomy, self-efficacy and risk-taking are likely to produce more entrepreneurs as individuals feel socially accepted and respected when setting up a new business.

***Consequences***

Studies on entrepreneurship are almost exclusively motivated by its economic benefits. First, new firm formation is usually associated with an increase in employment rates. Jovanovic's (1982) highly influential model of entrepreneurship predicts that the growth rates of younger, small firms are higher and more dispersed. In contrast, growth rates are lower among more mature and larger firms. This is justified on the grounds that entrepreneurs learn to become more efficient as they gain experience within their chosen industry. The predictions of the model are largely consistent with the available evidence what Geroski (1995) terms the stylized fact that smaller firms grow faster than their larger counterparts, and growth rates shrink as firms grow older and larger. The conclusion is that small, young firms create more jobs than their counterparts, relative to their size. However, although smaller firms contribute more to job creation, these jobs tend to be less stable due to the lower survival rates of new start-ups. Similarly, the remuneration offered to employees is lower in smaller firms (Van Praag and Ver Sloot, 2007).

Second, alongside the effects on employment creation, innovativeness is widely recognized as an important outcome of entrepreneurship. Schumpeter makes two contradictory statements on the root causes of innovation. On the one hand, he claims that entrepreneurs, as the agents of change, introduce innovations into the economic system, and that innovation could not be created within large enterprises (Schumpeter, 1934). On the other hand, he also hypothesizes that it is large firms with monopoly power that are proportionately more innovative than entrepreneurial firms (Schumpeter, 1942). Bearing this in mind, there are several reasons why young, small, entrepreneurial firms are in a better position to innovate. To begin with, larger firms are often characterized by thick layers of management which may result in a loss of information about critical market conditions. In contrast, shorter lines of communication and closer interactions in small firms are advantageous for innovation (Link and Reels, 1990). Furthermore, mature firms tend to overestimate the importance of technologies in use serving current customers but tend to react slowly to newly-emerging technologies (Gifford, 1998). It is argued that through their niche-filling capacity, small firms focus on exploring new markets and developing new products which support innovative behaviour (Chen and Hambrick, 1995). Nonetheless, one advantage of being a large firm in relation to innovation is that such firms can allocate more resources for risky and long-term R&D projects, whereas smaller enterprises face financial constraints (Parker, 2004). On the empirical side, Van Praag and

Versloot (2007) in their survey, summarize the link between being an entrepreneurial firm and innovative as follows: i) small firms do not allocate more resources to R&D activities than larger ones, but produce fewer innovations, ii) within the small firm context, the quality of innovations are higher and they are produced more efficiently, and iii) small firms are more capable in the commercialization of innovations.

Third, there is a positive link between entrepreneurship and economic growth, which has been verified by empirical studies (Audretsch and Thurik, 2001; Van Stel et al., 2005). Theoretically, it was mainly Schumpeter who advocated the concept that entrepreneurship leads to economic development through a process of creative destruction. The entrepreneur in Schumpeter's view is responsible for canalizing the factors of production into better usages, and thus for destroying the equilibrium. Nevertheless, it is well-known that the entrepreneur had been ignored in economic theory for decades (Parker, 2009). The neo-classical model with its traditional factors of production is inadequate to account for the variations in economic growth. The discrepancies are mostly attributed to the residuals or to exogenous technological change which leaves no room for entrepreneurship to explain the expansion in growth (Wennekers and Thurik, 1999). The endogenous growth theory with its emphasis on endogenously determined knowledge (Lucas, 1988; Romer, 1986) created new possibilities for fitting entrepreneurship into growth models. In the Romer (1986) model of endogenous growth, it is assumed that new knowledge automatically spills over to benefit the general economy. However, Audretsch (1995) finds this approach to be limited and argues that the endogenous growth model explains *why* new knowledge leads to economic growth but fails to explain *how* it is made possible. According to Audretsch (1995), this is resolved by the introduction of 'knowledge spillover theory of entrepreneurship'. This theory argues that the mere presence of new knowledge is not a sufficient condition for spillovers but the entrepreneurial act of starting a new firm serves as the missing link between spillovers and growth. Thus, this framework recognizes the critical role given to entrepreneurship in economic growth.

In his seminal work Baumol (1990) argues that entrepreneurial activity is not necessarily socially beneficial as it can take various forms such as productive, non-productive and even destructive kinds. Economic growth requires the allocation of entrepreneurial talent to socially productive practices, for instance, innovative acts. In contrast, the use of talent in destructive forms, including rent-seeking, organized crime and corruption, should be minimized in order to attain socially desirable outcomes. The allocation of talent across diverse operations is determined by the relative payoffs of pursing each activity which are in turn based on the institutional context. While we endorse Baumol's proposal for improving the understanding of entrepreneurship as an economic action, such a portrayal of entrepreneurial talent is not adopted here, and beyond the scope of this thesis. Put differently, in this book we follow the conventional wisdom in assuming that entrepreneurship is an economically and socially desirable activity.

## 1.3. Host Country Effects of FDI: Theory

Dunning (1970, p: 321) states that "…the modern multinational company is primarily a vehicle for the transfer of entrepreneurial talent rather than financial resources". This point is made during a time when many countries prohibited or restricted foreign investment due to the prevailing model of economic development focusing on nationalization and import substitution. World economies now are in a rush to increase their shares in FDI inflows and design policies to attract more investment in the expectation of wealth and knowledge. However, despite Dunning's early recognition of entrepreneurship in the realms of FDI and

changing attitudes toward foreign investment, the interface between entrepreneurship and FDI remains as a highly under-researched topic, both in theory and empirical work. An understanding of how these two are linked and why research efforts are limited require a careful examination of the theory behind host country effects of FDI.

Prior to the pioneering work of Hymer (1976) on FDI, no distinction is made between various types of international capital movements (Dunning and Rugman, 1985). FDI and portfolio investment are considered alike, and the prevailing explanation for these capital flows rested on differentials in interest rates (or profit) across countries. The analysis of Hymer (1976) concludes that while the latter is responsive to changes in interest rates, FDI could not be explained by this factor.[2] Another key dimension that FDI differs is the control over production and other business practises outside the national boundaries which enable foreign firms to minimize risks tied to operating in an alien culture at a distance. In contrast, portfolio investments do not give the right to control the firm. According to Hymer (1976), the very existence of FDI hinges on market imperfections. The author elaborates on four types of imperfections: i) imperfections in goods market (product differentiation), ii) imperfections in factor markets (unavailability of technology), iii) economies of scale both external and internal to market, and iv) government interventions. It is argued that by exercising control over their international operations, foreign firms have the potential to separate markets and remove competition.

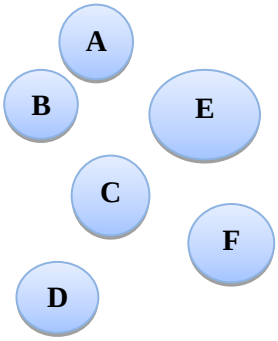
Foreign and domestic firms differ in most respects, favouring the former. Foreign firms are equipped with knowledge in the form of new products, processes, technology, as well as managerial and marketing skills that are unavailable within the local economy. In Hymer's perspective, also shared by later scholars, possessing firm-specific advantages over local firms offsets costs associated with doing business in an unfamiliar environment (customer preferences, cultural and language barriers, compliance with legal requirements, etc.). Moreover, foreign-owned companies devote more of their resources to R&D activities compared to local firms to intensify their unique know-how and proprietary technology (Griffith, 1999). Foreign firms are usually large with market power and exploit their ownership advantages to earn economic rent on their investment. Furthermore, they are likely to be less rooted in the local economy. Hence, they can relocate activity to other countries relatively easily compared to domestic firms, if conditions are unfavourable. Theory suggests that these very differences in firm characteristics are the sources of FDI *spillovers* in host countries (see, Caves, 1974). Spillovers arise when FDI imposes costs and benefits on domestic firms and can mainly be organized into two groups: productivity and wage spillovers. Next, we will turn our attention to the ties between FDI and domestic entrepreneurship.

Before proceeding, the ways foreign and domestic firms may interact need to be clarified. First, *horizontal linkages* occur when domestic and foreign firms compete directly with each other within the same industry (see, Figure 1-3). This type of tie is also known as *intra-industry linkages*, and under this arrangement, both kinds of firms serve the market with substitute goods, and have similar customers. Alternatively, foreign and domestic firms can be vertically-connected which refers to the case where firms buy from, or sell intermediate inputs to each other (see, Figure 1-4). *Vertical linkages*, also described as *inter-industry linkages*, can be further decomposed into *backward* and *forward linkages*.

[2] In their behavioural theory of the firm, Cyert and March (1963) also assert that the objective of a firm is not to maximize its profits but to attain a *satisficing* level of accomplishment. What is considered satisfactory rests on the aspiration level of the firm, which is in turn determined by its historical performance and past performance of comparable firms. If a target level of profits is not reached, then the aspiration level is adjusted downward. In contrast, if the performance of the firm exceeds the *satisficing* threshold, the aspiration level is revised upward.

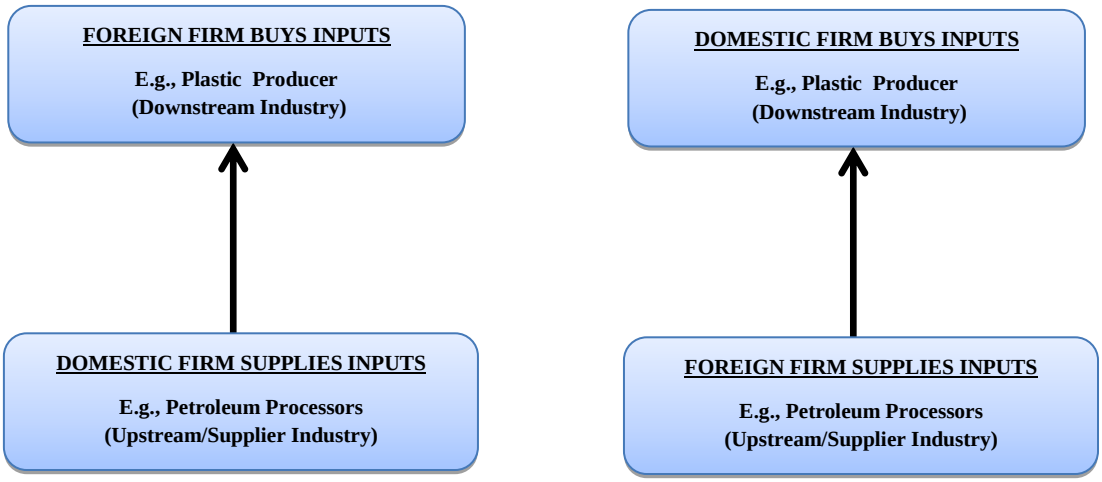
The former exists when foreign firms procure intermediate inputs and services from domestic firms and the latter takes place when foreign firms sell inputs to domestic firms. In the presence of vertical linkages, FDI is complementary to domestic production. Finally, while industries incorporating supplier firms are known as *upstream industries*, the ones that accommodate buyer firms are called as *downstream industries*.

**Figure 1-3:** Horizontal (intra-industry) linkages




Firms in the drug stores industry

**Figure 1-4:** Vertical (inter-industry) linkages




Backward Linkages

Forward Linkages

### *Productivity Spillovers*

There are several channels through which foreign firms may generate positive productivity spillovers. First, domestic firms can increase productivity if they closely observe and imitate foreign firms' technologies and organizational practices. This mechanism is known the demonstration effect or reverse engineering (Görg and Strobl, 2001). The scope of benefits hinges on the sophistication of technology, with complex products and processes requiring specialized labour and skills are hard to imitate through observation. In contrast, organizational innovations are easier to copy by domestic firms (Görg and Greenaway, 2004).

Second, positive productivity spillovers may occur through labour movement (Görg and Strobl, 2005). Foreign firms heavily invest in the training and education of the

workforce to improve their qualifications. Equipped with managerial expertise, production and marketing skills, employees in foreign firms may take up positions in domestic firms and thereby paving the way for improvements in productivity. The model by Fosfuri et al., (2001) shows the underlying conditions of how worker's mobility acts as a spillover channel. First, a foreign firm furnishes its employee with novel knowledge through training, only to compete with domestic firms for the services of the trained worker. That is to say, the employee leaves the foreign firm unless he is offered better working conditions. The predictions of the model are twofold: i) productivity spillovers take place if the trained worker is hired by the domestic firm, and ii) the trained employee is offered a higher wage rate because the foreign firm wants to inhibit knowledge leakage and thereby prevents the employee from moving to the local competitor. The formal representation of labour movement in Glass and Saggi (2002) produces comparable conclusions with an extra aspect. In this model, the foreign firm can either pay a wage premium to keep the trained worker or relocate its operations to preserve its technological superiority.

Another important channel through which productivity levels in domestic firms can be affected is market competition. Possessing superior technology and lower production costs, foreign firms may increase competition when entering domestic markets. In an imperfectly competitive market, foreign firms attract demand away from local competitors causing sales to fall, and fixed costs are spread over fewer units of production. As a result, productivity in domestic firms is negatively affected through competition, an effect that Aitken and Harrison (1999) describe as the market-stealing effect. On the other hand, FDI may force the least inefficient local firms to exit and surviving ones to either invest more in technology or to use the existing resources more efficiently to withstand the foreign rivalry. Therefore, there are two opposite effects of competition on domestic firm productivity.

Before proceeding, two issues should be highlighted. First, the spillover channels described above tend to apply when foreign and domestic firms compete in the same product market (intra-industry linkages). If, for example, foreign firms are export oriented, rather than focused on the local market, competition described above does not take place. Second, foreign firms have strong incentives to prevent technological leakage that can be transmitted through demonstration effects and labour movement, as local competitors can gain strength and challenge foreign firms. This protective tendency led some researchers to conclude that the scope for positive productivity spillovers is limited in the intra-industry context (Javorcik, 2004).

Theory suggests other channels for productivity spillovers which work through vertical linkages (inter-industry linkages). To begin with, foreign firms may directly transfer new technology to their local suppliers to increase the quality of intermediate inputs. Even in the absence of direct support, domestic suppliers may become more productive in response to foreign demand for higher quality inputs and services (Javorcik and Spatareanu, 2008). Second, overall demand for local inputs may soar upon foreign entry which allows local suppliers to enjoy economies of scale (see, Rivera-Batiz and Rivera-Batiz, 1990) or leads to a decrease in production costs (see, Markusen and Venables, 1999). Backward linkages between foreign and domestic firms are the main transmission channel behind these effects. Similarly, a greater availability of higher quality inputs produced by foreign firms may increase the productivity in domestic firms operating in the downstream industries (forward linkages). Negative vertical spillovers are also likely. Upon acquisition of a local company, foreign firms may use international supply chains, resulting in the destruction of existing supplier links and forcing local firms to cut production (Javorcik, 2004).

### *Wage Spillovers*

Lipsey (2004, p: 20) states that "it is rare to find a study of FDI and wages in any host country that does not find foreign-owned firms pay higher wages, on average, than at least privately-owned local firms". Having a productivity advantage, foreign firms pay a higher price for labour because they are usually larger, more capital and skill intensive than local firms. Furthermore, they may pay higher wages than domestic firms for workers of the same quality. Several reasons have been suggested to explain this strategy. To begin with, high wages may be offered to reduce labour turnover and retain workers who have accumulated firm-specific skills. Second, host county regulations may require foreign firms to incur higher labour costs. Besides, wage premium may be compensating for the possible disadvantages of employment in foreign firms. For example, employees may perceive jobs in local firms as more stable because foreign firms may be viewed as willing to hire and fire more rapidly, being more volatile employers. Fourth, due to asymmetric information in the labour markets, foreign firms may pay higher wages to attract high quality employees. Local firms are better informed about the characteristics of local workers and can attract them without the need for high wage premiums. Finally, due to internal fairness policies, foreign firms may pay higher wages to reduce the wage gap between its employees of the same quality who work in different countries (Lipsey, 2004).

The more interesting question is how wage levels in domestic firms respond to foreign firm presence. Theory suggests that wage spillovers of FDI can be both positive and negative (Görg and Greenaway, 2004). On the one hand, new foreign entry or the expansion of the activities of foreign firms both increase demand for labour, and therefore force domestic firms to increase wage rates to attract better qualified employees. Specifically, skilled workers are expected to benefit from wage increases as the new technology introduced by foreign firms is complementary with skilled labour. Second, wage premiums offered by foreign firms may shrink the labour supply available to domestic firms as workers observe higher wages are available elsewhere. This would also induce domestic firms to raise wages. Third, provided that technology introduced by foreign firms spreads into the local economy, and is internalized by local firms, domestic employees may become more productive over time. This allows local companies to reduce inefficiencies, leading to productivity gains. Higher productivity in turn raises wage rates within domestic firms.

On the other hand, foreign firms may draw the best workers by offering them wage premiums, and leaving domestic firms with employees who are less skilled and less productive. Therefore, increased foreign presence would exert a downward influence on wage levels in local firms. Moreover, as discussed in the previous section, competition with foreign firms in product markets may require domestic ones to dampen profit margins and become more productive. Alternatively, increased competition may also force domestic firms to operate under the minimum efficient scale, generating negative spillovers. If the latter is the case, wages in domestic firms would experience a decline.

There are other elements to be considered in determining the productivity and wage spillovers of FDI. To begin with, technological and geographical proximity to foreign firms are relevant for the degree of spillovers. When domestic firms have sufficient capacity to acquire, assimilate and transform new knowledge, they are more likely to benefit from FDI (Kokko et al., 1996). Similarly, spillovers are larger if the geographical distance between foreign and domestic firms is smaller (Navaretti and Venables, 2004). For example, it is more likely that people employed in foreign firms secure jobs in local firms operating in the same location of the foreign firm rather than elsewhere.

### *FDI Effects on Domestic Entrepreneurship*

The potential effects of foreign firms on domestic entrepreneurship are formalized by Markusen and Venables (1999). There are two types of industries and three types of firms in the model. First, the framework distinguishes the final goods producing sector from the inputs sector (downstream and upstream industries, respectively, in Figure 1-4). Second, the types of firms include domestic firms producing final goods, domestic firms producing inputs and foreign firms producing final goods. Put differently, there are horizontal linkages between domestic and foreign firms as they directly compete in the product market. Backward linkages also exist as upstream domestic firms supply intermediate inputs to downstream foreign firms. Both industries have an imperfectly competitive market structure with increasing returns to scale so that spillovers can take place.

The model depicts three main effects of FDI on domestic entrepreneurship. First, there is a FDI-induced competition effect on domestic firms in the final goods sector. The increased level of output leads to a reduction in market prices, and domestic firms lose their market share to foreign firms until ultimately going out of business. Thus, FDI leads to the crowding-out of local competitors. Second, the model suggests that the presence of foreign firms increases the demand for locally-produced intermediate inputs. With increasing returns to scale and backward linkages between foreign and domestic firms, additional demand drives the average costs downward and profits up. This leads to changes in the industry dynamics, stimulating the formation of new domestic firms in the inputs producing sector. Third, higher production volumes with lower input prices trigger another stimulus, encouraging entrepreneurship in the final goods industry. Hence, through additional demand for intermediate inputs foreign firms alter the number of domestic firms, both in the inputs and in the final goods producing sectors. Markusen and Venables (1999) argue that these predictions are largely dependent on the strength of the linkages between foreign and domestic firms. When intermediate inputs are, for example, procured from the home country or from partners in a third country, backward linkages tend to be weak. In this case, domestic firm entry is less likely.

Rodrìguez-Clare (1996) produced similar predictions. First, if foreign firms in host countries use local intermediate inputs intensively, this benefits domestic supplying industries (backward linkages). More interestingly, it is shown that when technological proximity between FDI home and host countries is high, in terms of the variety of intermediate inputs, there is more scope for local benefits. However, Rodrìguez-Clare (1996) also argues that if the conditions are reversed, i.e., less use of domestic inputs and a high technology gap, foreign firms exert negative effects on the host country and may operate in isolated enclaves separated from domestic firms. Last, although Rivera-Batiz and Rivera-Batiz (1990) do not explicitly formalize the link between FDI and local entrepreneurship, their model has important implications for this area. With increased demand in domestic business services in the form of advertising, transportation, distribution and communication network, etc., foreign firms encourage the expansion of the local business services sector.

Markusen and Venables (1999) illustrate the effects of FDI on domestic entrepreneurship via horizontal and backward linkages. On the one hand, while the impact of horizontal linkages on domestic firm formation is found to be negative due to stiff competition, backward linkages encourage entrepreneurship. The formalizations by Rodrìguez-Clare (1996) and Rivera-Batiz and Rivera-Batiz (1991) also demonstrate the importance of backward linkages. On the other hand, foreign firms may also lower the degree of backward linkages by shrinking the output level of domestic firms, which leads to a decline in demand for inputs as suggested by Lin and Saggi (2005). This downswing

in the demand may eventually force some of the domestic suppliers to go out of business, and constrain entrepreneurship in the upstream (supplier) industries. The net influence on domestic entry through backward linkages in turn depends on which of these two factors is dominant.

Besides negative effects, horizontal linkages may also exert positive effects on domestic entrepreneurship. Local entrepreneurs can improve their chances for successful start-ups by learning about the products and technologies introduced by foreign firms (demonstration effects). Furthermore, employees who are equipped with the right mix of knowledge through on-the-job training and experience in foreign firms may act as prospective entrepreneurs (labour turnover effects). However, foreign firms may successfully avoid knowledge dissipation on which their competitive edge depends, and thus confine the opportunities for domestic entrepreneurship (Javorcik, 2004).

Markusen and Venables (1999) model FDI effects on domestic entrepreneurship in a partial equilibrium framework which neglects factor market competition. However, foreign firms may also change supply-demand balances in factor markets and exploit their global scale, resources and depth of pocket in order to attract the most productive host economy resources, notably labour (Navaretti and Venables, 2004). By increasing overall wage rates and offering wage premiums, foreign firms may influence the trade-off between salaried-employment and entrepreneurship. For example, prospective entrepreneurs would be hired by foreign firms that offer higher wages and promising career opportunities. Entrepreneurs with their expertise in various domains may be especially complementary with the advanced technologies introduced by foreign firms. Thus, recruiting entrepreneurial individuals can bring numerous advantages to foreign firms. As this results in a smaller pool of future entrepreneurs (De Backer and Sleuwaegen, 2003) FDI may significantly restrict the creation of new firms in the host countries. The model by Grossman (1984) demonstrates that the impact of FDI on domestic entrepreneurship is twofold: it lowers the number of domestic entrepreneurs, and more importantly, it affects the distribution of individuals becoming an entrepreneur. This model supports our argument that higher earnings prospects in foreign firms attract potential entrepreneurs into wage-employment rather than entrepreneurship.

## 1.4. Foreign Aid and Domestic Entrepreneurship

In 2012, although developing countries succeeded in attracting more than half of the global FDI (UNCTAD, 2013), the distribution of inflows is highly skewed towards a small group of nations. Therefore, foreign aid plays a complementary role to FDI in low-income countries that are unable to attract foreign investors due to economic uncertainty and their inhospitable policy environment.

Within the past decade, foreign aid disbursements are almost exclusively centred within private sector development reforms (OECD/DAC, 2006). However, it is unclear what the implications are for domestic entrepreneurship. Aid flows generate a lot of rent, and therefore may not be used appropriately in the countries with poor policy environments. While reforms may foster new firm formation by creating opportunities, misuse of aid flows due to rent-seeking practises may inhibit entrepreneurship.

## 1.5. Host Country Effects of FDI: Empirical Evidence

Empirical studies on the host country effects of FDI at the micro level (looking at firms and industries) mainly concentrate on two sets of questions (Görg and Greenaway, 2004; Lipsey, 2004). One concerns whether foreign firms outperform domestic firms on a

specific performance measure (e.g., paying higher wages or being more productive). The second, where the majority of research efforts have focused, is concerned with whether there are spillover effects from FDI on local firms, particularly productivity spillovers. Therefore, we also review research findings related to the productivity spillovers from FDI here.

Most empirical analyses involve regressing the labour productivity or total factor productivity in domestic firms on a measure of foreign presence, generally computed as the share of employment, sales or output of foreign firms in total industry values (Görg and Strobl, 2001). Early work on this topic is the major study by Caves (1974) that relates foreign presence to the value-added per worker in Australian manufacturing sectors. Globerman (1979) replicated the same analysis using Canadian data. Later studies, mostly based on industry-level cross sectional data, report a positive relationship between foreign presence and productivity levels in domestic firms. See, for example, Blomström and Persson (1983), and Blomström and Wolf (1994) on Mexico. The key limitation of these papers lies, however, in their inability to establish the direction of causality. Specifically, a positive association may indicate that foreign firms are inclined to enter into sectors characterised by high productivity, rather than they are the direct cause of increased productivity. Furthermore, observed gains in average industry productivity may also be due to the withdrawal of less productive domestic firms from the market ensuing FDI, or due to an increased market share by foreign firms.

Görg and Strobl (2001) argue that the use of firm-level panel data is the most suitable tool to analyse FDI spillovers for two reasons. First, panel data allows one to assess productivity levels in local firms over time, rather than a single snapshot approach. Second, panel data permits factors such as unobserved firm-specific characteristics to be controlled when investigating spillover effects. As opposed to earlier studies that use industry-level cross sectional data, later studies benefiting from firm-level panel data demonstrated that there is either no change or even a decrease in the productivity of domestic firms due to foreign presence in the same sector. See, for example, Haddad and Harrison (1993) on Morocco, Aitken and Harrison (1999) on Venezuela, Djankov and Hoekman (2000) on Czech Republic, Konings (2001) on Bulgaria, Poland, Romania, Javorcik (2004) on Lithuania, and Javorcik and Spatareanu (2008) on Romania. Although these papers focus on developing nations or countries in transition, and cast doubt on the existence of productivity effects, research efforts directed toward developed countries are more promising. See, for example, Haskel et al., (2007), and Keller and Yeaple (2009) for positive FDI effects in the UK and the US. Kokko et al., (1996) argue that there is more scope for FDI spillovers when the technology gap between domestic and foreign firms is small which allows the former to absorb the new knowledge, an argument similar to that proposed by Glass and Saggi (1998). This provides a potential explanation why FDI contributes to the productivity of domestic firms in developed countries, but not in developing countries.

Nonetheless, the latest available survey by Görg and Greenaway (2004) concludes that robust empirical support for positive productivity spillovers is at best mixed. The authors indicate that researchers might be looking in the wrong place for spillovers and through the wrong lenses. This corroborates with Krugman (1991, p: 53) who states that "knowledge flows … leave no paper trail by which they may be measured and tracked", so identifying spillovers is inherently difficult. After all, productivity in domestic firms may not be the most accurate indicator to capture FDI spillovers.

## 1.6. This Study

First of all, we argue that it is necessary to look at the bigger picture using aggregate data to get a bird's eye view of the relationship between FDI and domestic entrepreneurship as the former is a source of opportunities and threats for entrepreneurship. It is not a priori clear whether FDI effects are positive or negative. Therefore, the main aim in Chapter 2 is to detect which of these effects overweighs the other, which in turn facilitates a better understanding of the subsequent chapters. The empirical analysis is carried out in two steps: i) the direct relationship between FDI and entrepreneurship is assessed on a cross-country basis—a sample of developed and developing countries. The aggregate analysis captures the sum of horizontal and vertical effects of FDI across the economy as a whole, and ii) we use subsamples that are stratified by industry to focus attention on horizontal effects. We differentiate between various industries (manufacturing, business services, and consumer-oriented sectors, etc.) to answer the question of how the industry's FDI affects domestic entry into the same industry. The main lesson from the results is that FDI crowds-out local entrepreneurship both at the aggregate and intra-industry levels. Although the association is negative, the economic effect is quite small. Nascent entrepreneurship is the most vulnerable type to foreign firm presence. To summarize, we aim to answer the following research question in Chapter 2:

**Research Question 1:** *What is the direct effect of FDI on domestic entrepreneurship in a cross-country context and do different industries respond differently to FDI?*

The fact that FDI effects are negative needs further elaboration with regard to its underlying mechanism. Chapter 3 covers our approach to this task. We argue that both industry competition (thus concentration) and wage levels are two possible transmission channels of FDI effects on domestic entrepreneurship. Increased market power by foreign firms and crowding-out subsequent to intense competition may engender negative consequences for entrepreneurial activities. Furthermore, wage premiums offered by foreign firms may reduce the incentives to form new businesses as potential entrepreneurs may self-select into salaried-employment. Motivated by these predictions, the analysis looks at whether the effects of FDI on entrepreneurship are transmitted through its direct association with i) industry competition, and ii) industry wages, respectively. The credibility of each assertion is tested by using data from Dutch manufacturing industries. The heterogeneity of industries in levels of technological intensity is also taken into account. The rationale for this lies in the assumption that an industry's position on the technology ladder may play a role in determining the size of the FDI effects. The most salient result is that the effects of FDI on Dutch firm entry are mainly conveyed through wage and competition channels. Once these indirect effects are accounted for, the direct effect of FDI on entrepreneurship becomes absent. More precisely, the research question addressed in Chapter 3 is as follows:

**Research Question 2:** *Does the impact of FDI on entrepreneurship transmitted through its indirect effects on wages and competition in Dutch manufacturing industries, and does FDI still have any direct impact on entrepreneurship once its indirect effects are separated out?*

Chapter 4 considers the role of vertical industry linkages between foreign and domestic firms in entrepreneurship development which has received little attention in the literature so far. Such interdependencies are achieved through: i) backward linkages, e.g., when local firms provide intermediate inputs to foreign firms, and ii) forward linkages,

e.g., when foreign suppliers deliver inputs to be used by domestic final goods producing firms. We argue that increased demand for local inputs by foreign firms may induce the formation of domestic firms. Similarly, the availability of new goods and services introduced by foreign suppliers may stimulate domestic entry into the final goods producing industries, using them as inputs. These predictions are tested using data from Turkish manufacturing and service industries. To provide a complete picture, the investigation also considers the effects of horizontal linkages established with foreign firms. Results show that FDI has no impact on Turkish firm entry via backward and horizontal linkages. In contrast, we found a positive and significant association between FDI and entrepreneurship transmitted through forward linkages. Insignificant FDI effects via backward linkages suggest that supplier-buyer relationships between Turkish and foreign firms may not be strong enough to create benefits for firm entry. Likewise, the absence of anticipated negative effects via horizontal linkages on domestic entry may be explained by the increases in the competitive strength of Turkish firms which have been realized over the past decade. To sum up, Chapter 4 attempts to answer the following question:

**Research Question 3:** *Do backward, forward and horizontal linkages between foreign and domestic firms play a role in entrepreneurship development in Turkey?*

While the focus in Chapters 2 to 4 is on the FDI-entrepreneurship nexus, in Chapter 5 we examine the effects of foreign aid flows on the same outcome variable, namely entrepreneurship. Foreign aid is considered as both complementary and supplementary to FDI in countries where foreign investors show little interest due to the perceived high risk economic environment. Aid flows are used to finance many development projects, yet this direction of research has received scant attention. Motivated by this gap, our empirical analysis is conducted in two steps. Due to the 'fungibility' issue which occurs if recipient countries use aid for other purposes than initially designed, in the first step, we analyse the effects of aggregate aid flows on entrepreneurship. Next, we differentiate aid by its disbursement purposes to cover three main areas that are deemed to be the most important for entrepreneurial development. Namely, aid flows aiming to improve educational, infrastructure and institutional capacities of aid-receiving countries are taken into account. Two main results emerge: i) we demonstrate a robust positive relationship between aggregate aid flows and entrepreneurship, and ii) when the purpose of aid is considered, the strength of this link weakens, and eventually becomes insignificant. Taken together, aid encourages entrepreneurial endeavours but only at the aggregate level. This supports the idea that the fungibility of aid may play a role in driving the results. More precisely, the following research question is investigated in this chapter:

**Research Question 4:** *Do foreign aid flows play a role in entrepreneurship development in aid-receiving countries and do the effects of aid that are disbursed for different purposes differ from the effects of aggregate aid flows on entrepreneurship?*

This thesis comprises 6 chapters. Chapter 1 provides a general introduction to the topic. Research questions, contributions and the way they relate to one another are also explained here. The body of the thesis extends from Chapters 2 to 5 where the first three are devoted to the analysis of FDI effects on domestic entrepreneurship from various perspectives. In Chapter 5, we address the impact that foreign aid may have on entrepreneurial activities in aid-receiving countries. All chapters are self-contained papers allowing each to be read independently of the others. Therefore, some information is repeated.

# Chapter 2 : Foreign Direct Investment and Domestic Entrepreneurship: Blessing or Curse?

## 2.1. Introduction[3]

Host countries welcome FDI[4] more favourably now compared to a few decades ago, and its size is seen as an important indicator of the countries' integration into the world economy. Positive attitude towards FDI is based on the conviction that it brings several benefits to host economies. The flow of capital, technology, knowledge and skills across national boundaries creates opportunities for host countries, particularly for developing ones to 'catch up' with others (Caves, 1996; Javorcik, 2004; Kokko et al., 1996; Markusen and Venables, 1999).

The literature on the host country effects of FDI mainly addresses productivity spillovers via the dissemination of innovations to locally-owned firms (Ayyagari and Kosová, 2010; Barrios et al., 2005). Other avenues for positive spillovers include demonstration effects or reverse engineering (Barry et al., 2003), labour mobility (Fosfuri et al., 2001) and enhanced export performance (Greenaway et al., 2004). Caves (1974) and Kokko et al., (1996) emphasize potential advantages to the recipient country through contributions to restructuring the economy. However, some authors also draw attention to the detrimental effect of FDI on development (Aitken and Harrison, 1999; Barrios et al., 2005; Kathuria, 2000). Negative spillovers can derive from, for example, reduced market competition through entry-deterrence in the style of Dixit (1980) or crowding-out (Caves, 1996). Furthermore, the scope of negative and positive spillovers depends on whether foreign and domestic firms are horizontally[5] or vertically related to each other (Javorcik and Spatareanu, 2008), and whether competitors' products are strategic substitutes or strategic complements (Bulow et al., 1985; Fudenberg and Tirole, 1984).

New firm entry is an interesting lens through which to evaluate how spillovers from FDI affect the host economy because of the important role of domestic entrepreneurship in GDP growth (Baumol and Strom, 2007; Koellinger and Thurik, 2012; Minniti and Lévesque, 2010) and in generating employment and innovation (Van Praag and Versloot, 2007). Rates of entrepreneurship also indicate the competitive pressures within the

[3] This chapter is based on: Danakol, S. H., Estrin, S., Reynolds, P., and Weitzel, U. (2014). CEP Discussion Paper No: 1268, May 2014, *Foreign Direct Investment and Domestic Entrepreneurship: Blessing or Curse?* S.H.Danakol collected and analyzed the data, wrote the paper and worked on subsequent revisions; S. Estrin and U. Weitzel assisted in analyses and revisions; P. Reynolds revised consolidated data from the Global Entrepreneurship Monitor (GEM) project to facilitate the analysis. We acknowledge helpful comments from Niels Bosma, Jolanda Hessels, Klaus Meyer, Wim Naude, Erik Stam and seminar participants at the National Academies in Washington, German Institute for Economic Research in Washington (DIWDC), Maastricht School of Management, Utrecht School of Economics and session participants at the 2013 European Economic Association Meetings in Gothenburg, 2013 Babson College Entrepreneurship Research Conference in Lyon and workshop on 'Institutions and the Allocation of Entrepreneurship' in Utrecht. We also gratefully acknowledge financial support from the Dutch Ministry for Economic Affairs.

[4] In this study, 'FDI', 'FDI inflows', 'foreign firms', 'FDI presence' and 'foreign firm presence' are used interchangeably.

[5] In this study, the terms 'horizontal', 'intra-industry' and 'within industry' are used interchangeably and refer to the market structure where foreign and domestic firms compete directly either in product or labour markets. Likewise, 'vertical', 'inter-industry' and 'across industry' stand as synonyms for each other and refer to the case where foreign and domestic firms buy and sell intermediate inputs from each other.

domestic economy, and its responsiveness to exogenous changes in technology and patterns of demand (Parker, 2004). As such, they represent an important means whereby the benefits of foreign investment in terms of technology and human capital might penetrate the host economy (Acs et al., 2008). On the other hand, especially in a developing economy, foreign firms may pay higher wages to workers, enabling them to scoop up scarce domestic resources such as managerial talent and skilled labour. Therefore, potential entrepreneurs may become tied up as employees of multinational firms. Negative effects of FDI on domestic entrepreneurship may also be observed through increased domestic market monopoly power leading to higher market entry barriers. Thus, the theoretical arguments on each side of this debate are inconclusive which highlights the need for robust empirical evidence, which at present is lacking in the literature.

In particular, we seek to answer the following question in this paper: Does FDI via cross-border M&A affect domestic entrepreneurship in host economies and if so, whether the effects are negative or positive? For this purpose, we use an unbalanced micro-panel of more than two thousand individuals in each of the seventy countries sampled including both developed and developing economies. Empirical analysis is conducted at three levels of aggregation. First, as suggested by Acs et al., (2007), we exploit cross-country variation over time in FDI and entrepreneurship rates to identify the aggregate effects of the former. Barbosa and Eiriz (2007) argue that industries differ in technology and innovation characteristics as well as in their ability to attract foreign investment which in turn determines the responsiveness of domestic entrepreneurship. To account for this possibility, two levels of industry breakdown are used to focus attention on the intra-industry (horizontal) effects of FDI. Furthermore, Görg and Greenaway (2004) highlight that the endogeneity of FDI is a familiar problem in the empirical literature relative to host country effects of FDI. Our study takes into account this concern with an instrumental variable approach. Finally, Chowdhury et al., (2014) suggest that the effects of FDI on nascent entrepreneurship, the incipient intention to becoming an entrepreneur (Reynold et al., 2005), differ from the effects on new business ownership because the former is still in its infancy, and more prone to both opportunities and challenges imposed by FDI. Following Chowdhury et al., (2014), we consider the heterogeneity in entrepreneurial activities in terms of phases of their life span in the analysis.

Our results indicate that the relationship between FDI inflows and entrepreneurship is in fact negative, indicating crowding-out at both the aggregate and industry level. This result is consistently found across different specifications and a variety of measures of entrepreneurial activity, of which nascent entrepreneurship is our preferred measure. At the cross country level, we find that a 10% increase in FDI inflows as a share of GDP causes nascent entrepreneurship to fall by 0.184%. The results at the two industry levels of disaggregation are qualitatively similar though varying in size and significance.

Our paper relates to two strands of existing literature. First, it relates to the large literature that studies the determinants of entrepreneurship including personal characteristics as well as political and economic institutions (Parker, 2004). Regarding the individual characteristics,[6] for example, entrepreneurs are associated with a need for achievement (McClellan, 1961), high risk-taking propensity (Kihlstrom and Laffont, 1979) and high self-efficacy (Chen et al., 1998) referring to the individuals' belief in their capability to successfully perform a particular task. In relation to the external conditions, for instance, a greater availability of start-up capital (Marlow and Patton, 2005), low levels of business regulations (Van Stel et al., 2007) and greater protection of property rights

[6] See, Rauch and Frese (2007) for a meta-analysis on the link between entrepreneurs' personal characteristics and business formation.

(Parker, 2007) lead to more entrepreneurship. In this literature, the effects of FDI are largely neglected (Acs and Szerb, 2007; Acs et al., 2007; Chowdhury et al., 2014). Our paper contributes to the literature by explicitly considering the role of foreign investment on entrepreneurship development.

Second, our paper also relates to the literature focusing on the impact of FDI on host countries. The macro level analysis generally focuses on cross-country growth regressions and seeks to identify whether countries receiving larger FDI grow faster. The findings from this approach are mixed (Navaretti and Venables, 2004). For example, economic growth is positively associated with FDI when countries are sufficiently rich (Blomström et al., 1992), have a minimum threshold stock of human capital (Borensztein et al., 1998), or are financially developed (Alfaro et al., 2004). These results are not corroborated in Carkovic and Levine (2005) who take into account the problem of reverse causality and find no evidence that FDI affects growth. The second strand is micro-oriented, looking at the effects of FDI on firms and industries. The majority of these research efforts are focused on searching for productivity spillovers to domestic firms. By evaluating some forty studies, Görg and Greenaway (2004) conclude that the evidence for positive productivity spillovers was at best weak. We contribute to this wider literature by incorporating both macro- and micro-level analysis into a single framework focusing on entrepreneurship rather than growth and productivity, as these topics are heavily researched.

We note that the empirical literature is not entirely silent on the effects of FDI on entrepreneurship. There are a few single country studies cantered on a particular industry (e.g., Barrios et al., 2005; De Backer and Sleuwaegen, 2003; Görg and Strobl, 2002). Our paper investigates the FDI-entrepreneurship nexus in a more comprehensive manner than these earlier papers based on a panel of both developed and developing countries over a ten-year span. Furthermore, while the aforementioned studies use either gross or net entry rates, we employ various measures to capture entrepreneurship at different phases of their life span.

Many empirical analyses treat FDI as a homogeneous flow of funds (Navaretti and Venables, 2004). In reality, FDI consists of: i) entry via greenfield investment which represents an addition to the host countries' capital stock, and ii) M&A entry which refers to a change in the ownership of existing production facilities rather than a relocation of economic[7] activity.[8] By focusing on FDI via M&A, this study contributes to the small empirical literature that investigates the impact of greenfield and M&A on host countries separately.[9]

[7] Dunning's OLI framework (1977) treats the two types of FDI equivalent.

[8] There are several papers formally showing firms' decision between greenfield investment and M&A entry. (e.g., Haller, 2009; Navaretti and Venables, 2004; Nocke and Yeaple, 2007, 2008; Mattoo et al., 2004; Raff et al., 2009). First, Navaretti and Venables (2004) show that entry via M&A involves loss of a domestic firm (a product variety) and eliminates the associated fixed costs of the joining firms. Furthermore, high trade costs are conducive to both types of FDI relative to exporting. Second, Nocke and Yeaple (2007) demonstrate that firms involve M&A to exploit complementarities between their competences and host country-specific capabilities. Finally, Nocke and Yeaple (2008) and Raff et al., (2009) posit that more productive firms enter the foreign market as a greenfield rather than M&A.

[9] While there is a fair amount of empirical papers linking M&A to the post-acquisition performance of target firms including innovative capabilities and productivity (e.g., Arnold and Javorcik, 2009; Bandick et al., 2014; Cloodt et al., 2006; Criscuolo and Martin, 2009; Harris and Robinson, 2002; McGuckin and Nguyen, 1995), studies evaluating the impact of M&A on domestic firms are rather limited. First, using data on Norwegian manufacturing firms, Balsvik and Haller (2010) find that while greenfield FDI has a negative impact on the productivity of domestic firms in the same industry (horizontal linkages), foreign entry via acquisition increases local firms' productivity. Second, Ashraf et al., (2014) examine the effects of FDI via

The remainder of this paper is structured as follows. In the next section, we present the literature on the relationship between FDI and domestic entrepreneurship. In the third section we discuss the data employed, which combines a new unbalanced cross-country panel by industry where measures of entrepreneurship are derived from the Global Entrepreneurship Monitor (GEM) with information at the industrial level and cross border M&A data from Thomson. Much of the work in this study is concerned with aligning the industrial classifications of the two datasets and identifying appropriate instruments for FDI in entrepreneurship equations. These methodological issues form the basis of the fourth section (and the appendix B) with the results reported in the fifth section. Conclusions are drawn in the sixth section leading to the discussion of avenues for future research in the final section.

## 2.2. FDI and Domestic Entrepreneurship

Literature on FDI effects has argued that the impact on the host economy may be both positive, (Blanchard et al., 2009; Javorcik, 2004), and negative (Aitken and Harrison, 1999). In this section, we summarize the main arguments from both perspectives.

### 2.2.1. Positive Effects on Entrepreneurship

Foreign firms generally possess more advanced technology and management practices compared to their local counterparts which often translate into a productivity advantage (Caves, 1996; Dunning, 1993). This occurs through high levels of investment in innovative activities such as product, service and process developments (Guadalupe et al., 2012). In turn, exploiting the ownership advantages in resources and capacities combined with host country factors[10] is among the main motivations behind entering a foreign market (Rugman, 1981). Once foreign firms have entered a domestic market, the diffusion of ideas and transfer of technology resulting from interaction with local economy are likely to occur (Haskel et al., 2007; Javorcik, 2004), and thereby creating opportunities for domestic entrepreneurship (Acs et al., 2007; Chowdhury et al., 2014).

The relationship between new firm entry and economic welfare is not unambiguous; since Chamberlain (1956), economists have been aware of the dangers of excessive entry as well as its opposite effect. However, a substantial body of literature attests to the important role of entrepreneurial entry in economic growth and job creation in both developing and developed economies (Acs and Audretsch, 2003; Baumol and Strom, 2007; Koellinger and Thurik, 2012; Schumpeter, 1934). Rates of entrepreneurship usually go hand-in-hand with competition in the economy; and both of them strongly contribute to

greenfield and M&A on total factor productivity (TFP) in developed and developing host countries. Results are threefold: i) while no productivity effects are found due to greenfield investment, FDI via M&A increases TFP in the whole sample, ii) the developing country subsample does not benefit from either types of FDI, and iii) M&A has a strong and positive effect on TFP in the subsample of developed countries. The authors argue that the host countries must not lag too far behind the technological frontier in order to benefit from FDI.

[10] For example, Grossman et al., (2006) describe the factors motivating FDI into host countries. It is suggested that even though locational drivers of FDI vary, the costs of factors of production, transportation and the availability of economies of scale are the most important. Similarly, Ihrig (2005) argues that the level of technological differences between foreign and domestic firms plays a crucial role in the location of FDI. The results show that while horizontal FDI is attracted to countries with relatively better technology, vertical FDI goes hand-in-hand with low levels of technology available in the host countries. Related to this, Alfaro and Charlton (2009) argue that due to the limited data availability literature tends to systematically underestimate vertical FDI flows, and this type of foreign investment is often misclassified as horizontal FDI. Consequently, the authors suggest that findings of studies distinguishing horizontal and vertical FDI need to be evaluated with care unless adequate attention is given to this separation.

the level of innovation and technological progress that are vital to economic performance (Parker, 2004). As a result, domestic entry may be seen as an important link to diffuse technology, human capital and managerial skills accompanying FDI into the host economy (Acs et al., 2008).

There are several channels through which FDI may affect entrepreneurship positively. First, foreign firms augment the knowledge base in the local market by introducing new products, processes, management techniques and workforce skills. Interaction with foreign firms increases the awareness of prospective entrepreneurs on the availability of new knowledge, and enables them to learn about these technologies and market opportunities through *demonstration* (Kokko, 1992). As the novelties of FDI are already tested in markets, domestic entrepreneurs may convert them into profitable undertakings in a shorter time with less risk of failure. Furthermore, local entrepreneurs may view foreign firms as role models from which to learn and emulate in their founding processes (Barbosa and Eiriz, 2009).

Second, foreign firms may serve as a breeding ground for future entrepreneurs through *labour mobility* (Fosfuri et al., 2001). They provide extensive training to upgrade the skills of their staff on technical and managerial know-how. Equipped with new skills, the local workforce previously employed by foreign firms might create businesses of their own.

Third, export-oriented FDI can provide prospective entrepreneurs with the knowledge necessary to penetrate overseas markets (Greenway et al., 2004). New firms may be created when export market opportunities are identified by local entrepreneurs, for example, by exploiting trade channels and reputations that have been established by foreign firms (Aitken et al., 1997; Kneller and Pisu, 2007).

Aforementioned channels are not mutually exclusive, but work together to encourage domestic entrepreneurship mainly within an industry, horizontally (Lee et al., 2014). The importance of inter-industry or vertical linkages is also considered in entrepreneurship development (Javorcik and Spatareanu, 2008; Markusen and Venables, 1999; Rodrìguez-Clare, 1996). Vertical linkages are established between firms for the sourcing of goods and services in the supply chain, and can take two forms. Backward linkages occur when foreign firms purchase intermediate inputs from local suppliers. Likewise, forward linkages arise when foreign firms supply inputs to domestic firms. First, foreign firms may increase the demand for intermediate inputs produced by local firms, and this may stimulate domestic entrepreneurship in supplier industries through backward linkages (Barrios et al., 2005; Markusen and Venables, 1999). The extent of positive effects through backward linkages depends on how strongly foreign firms are integrated into local supply chains, and whether they use locally produced inputs (Caves, 1996). Sourcing inputs internationally would culminate in weak local ties limiting potential benefits for entrepreneurship development. Second, with respect to forward linkages, the availability of new and less costly, but at the same time high quality, inputs supplied by foreign firms may encourage domestic firm formation in the final goods producing industries (Rodrìguez-Clare, 1996). Finally, the impact on local industry may also be visible when new firms are established through movement of labour across vertically related industries (Görg and Strobl, 2005).

### 2.2.2. Negative Effects on Entrepreneurship

In contrast to the above arguments, stiff competition in the factor and product markets may result in foreign firms poaching local resources, notably skilled labour, and crowding-out business opportunities. First, FDI would shrink the pool of prospective entrepreneurs by

altering the relative payoffs of entrepreneurship compared to wage-employment (Grossman, 1984; De Backer and Sleuwaegen, 2003). Foreign firms can exploit their domestic and international market power to offer higher wages and better working conditions. Therefore, talented workers may decide to take up positions in foreign firms instead of utilizing their skills in the development of domestic firms.

Second, FDI-induced competition in product markets may create downward pressure on prices, resulting in the displacement of local firms (Markusen and Venables, 1999). Host country enterprises are urged to undertake efficiency-enhancing investments, or they face the increased risk of a loss of market share,[11] as described by Aitken and Harrison (1999), and, ultimately going out of business. In the most extreme cases, foreign firms can dominate the industry, and attain monopolistic power. This negative effect is most prominent in the intra-industry context because domestic and foreign firms are direct competitors.

Foreign firms may increase entry barriers for local entrepreneurs, and thus further constrain new firm formation. First, entry barriers become higher if foreign firms take advantage of economies of scale arising from the ownership of knowledge-based assets and/or more efficient use of resources. Second, foreign firms are often eligible for various incentives such as export incentive programmes and tax allowances which can result in high entry barriers in certain industries (Aitken and Harrison, 1999; Haddad and Harrison, 1993). Third, foreign firms could divert a significant amount of domestic factor endowments (e.g., finance, managerial and skilled labour) to themselves, raising the costs of entry for future entrepreneurs.

One remark is in order. Crowding-out in different domestic markets (product, labour, or supplier) is not necessarily negative for economic welfare; FDI-induced competition could increase domestic welfare by putting local assets to more efficient use. However, depending on the type and nature of FDI, the crowding-out effect can also have adverse effects both across industries (Bulow et al., 1985; Fudenberg and Tirole, 1984) and within industries; for example, by increasing entry barriers as discussed above (Dixit, 1980). The direction of the impact depends on whether foreign entry is associated with increased market power in the relevant local market.

The empirical literature investigating the effects of FDI on entrepreneurship comprises single industry and country studies producing contradictory results. For example, De Backer and Sleuwaegen (2003) analyse firm entry and exit in the Belgian manufacturing sectors for 1990-1995. Their results suggest a crowding-out of entrepreneurship from FDI, which occurs in both product and labour markets. In contrast, Görg and Strobl (2002) find that FDI presence has a positive effect on domestic entry in the Irish manufacturing sectors. Finally, Barrios et al., (2005) find a U-shaped relationship between FDI and local firms' entry by using plant-level Irish manufacturing data. Thus there are potentially two opposing effects of FDI on local entrepreneurship. Which effect dominates is an empirical question, which we attempt to answer in this paper.

## 2.3. Data

Our empirical work is based on the merger and development of two huge inter-industry cross-country panel datasets. This includes up to seventy countries over a period of ten years with several subgroups of industries at two different levels of industry aggregation. We combine information at the individual level from the Global Entrepreneurship Monitor (GEM) with data at the industrial level regarding FDI measured by cross-border M&A

[11] Aitken and Harrison (1999) refer to this effect as 'the market stealing effect.'

from Thomson. The GEM data has been collected as part of a series of national surveys since 1999 and now covers more than seventy nations. The GEM is based on representative national surveys of the adult population with a sample size of at least 2000 individuals, per country. The survey samples are derived from the working age population and the database includes both entrepreneurs and non-entrepreneurs. The country selection has been increasing since 2000, with a greater emphasis on developing economies. This implies that the panel element of the dataset is unbalanced. Information from the survey in relation to the industry in which the individual is employed has been used to construct a variety of measures of entrepreneurial entry at two levels of industrial disaggregation. The second dataset provides information on FDI via M&A into each of the GEM countries for the relevant years, and is also disaggregated to the same industrial classifications. Namely, we consider three levels of aggregation for the data: i) the country level (whole sample), and ii) two levels of industry breakdown. The most disaggregated groupings of industries include 11 1-digit ISIC rev.3 industries, e.g., manufacturing. Second, at a higher level, we identify four broad 'industry clusters' which incorporate aggregates of these 1-digit industries on the basis of the similarities between them.[12] Much of the research in this project has involved efforts in matching industrial level data of the two datasets.[13]

Our measure of FDI is restricted in the sense that it only considers investment through M&A, and therefore does not take account of greenfield FDI. We acknowledge this limitation in our interpretation of the results. In particular, FDI through M&A is perhaps more likely than FDI as a whole to have an effect, whether positive or negative, on entrepreneurship. This is because M&A ramps up to full capacity very quickly, while greenfield investments take longer to implement and to reach minimum efficient scale (UNCTAD, 2001). Hence, the effects from greenfield investments are likely to be slower in taking effect and initially smaller in impact than those from M&A activities.

We are also concerned that there might be other factors we cannot control for, which may explain both entrepreneurship and FDI via M&A. To circumvent this problem, our FDI measure is instrumented by using two different variables that are discussed in detail below. Furthermore, there is the possibility that the country-level FDI inflows may affect some of the country variables, giving rise to the possibility of simultaneity bias. For this reason, we use a simple lag structure in our estimations. Finally, the issue of multicollinearity, mainly arising due to GDP per capita as a control variable, is addressed by converting this measure of economic development into a number of dummy variables. We return to these issues in the methodology section.

### *Dependent Variables*

As noted, entrepreneurial activities are viewed as important contributors to economic development (Koellinger and Thurik, 2012; Sobel, 2008), though the scarcity of comparable cross-country data on entrepreneurship has constituted a limitation in the literature (Carree and Thurik, 2003). The GEM Adult Population Survey project takes on this challenge by deriving an unbalanced panel of a variety of measures of entrepreneurship which are now increasingly used in studies. Since the project was initiated in 1999, the GEM has evolved as a cross-national benchmarking tool with an aim to quantify entrepreneurial activities by country and year (Reynolds et al., 2003).[14]

[12] Tables 2-B-1 and 2-B-2 in the appendix B provide more information on the industry groupings.
[13] Additional explanations on the transformation of the industry codes are given in the appendix B.
[14] There are gaps in the panel due to changes in the sample countries that are included in each wave of the survey; the additions and eliminations lead to missing values appearing in the dataset. For example, Switzerland has GEM data corresponding to years 2002, 2003, 2005, 2007 and 2009.

One of the strengths of the GEM is in its measures of entrepreneurial activity at the individual level. The survey identifies a variety of different measures of entrepreneurial activity of which we employ three as the dependent variable in our analysis. The definition of each variable is as follows (Reynolds et al., 2002, 2003):

*Nascent entrepreneurship rate:* The percentage of the adult population (18-64 years old) who are currently active in establishing a business that they will own or co-own. This start-up has yet to generate positive cash flows for more than three months.[15]

*New business ownership rate:* New business owners are former nascent entrepreneurs. The variable is defined as the percentage of the adult population who presently own a firm and have done so for more than a period of three months but less than forty-two months.

*Total early-stage entrepreneurship rate* (TEA)*:* The percentage of the adult population who are classified as either nascent or new business owners.

In line with Wennekers et al. (2005), we focus mainly on nascent entrepreneurship. This is because our primary focus is on the relatively immediate influence of FDI inflows on entrepreneurship, though with a lag to address issues of causality. Nascent entrepreneurship is the dependent variable with cash flows of less than a year; the other GEM measures also capture survival rates of businesses, as they cover a longer time horizon in their measurement. Nonetheless, results obtained from these alternative measures are reported to indicate robustness.

### *Independent Variables*

FDI is measured as annual cross-border M&A inflows at the host country level. The motivations behind our choice of M&A deals as proxy for FDI inflows are as follows. First, detailed industry breakdowns of FDI inflows across countries and years cannot be obtained; an issue which is often identified in the literature (Shimizu et al., 2004). M&A deals provide a good alternative to eliminate this shortcoming as each M&A transaction in our dataset comes with a 6-digit NAICS code. Second, M&A activities are the main stimulus behind FDI and cover around 80% of global FDI inflows (Stiebale and Reize, 2011; UNCTAD, 2007). Finally, cross-border M&A transactions have a more immediate impact on local entrepreneurship than greenfield projects. Greenfield projects require more time and effort to become operational and to build up links within the local economy (UNCTAD, 2001).

M&A data are obtained from the Thomson SDC Platinum database[16], which supplies an authoritative coverage of worldwide M&A activities. We downloaded all deals that comprise at least 10% target ownership[17] for the foreign acquiring firm.[18] Altogether, we use 23 126 M&A deal values to compute FDI inflows per country and year.[19] We

[15] The GEM survey employs, among others, the following questions to identify measures of entrepreneurship: i) How many months have you been involved in starting this business?, ii) will you personally own all, part, or none of this business?, iii) has the new business paid any salaries, wages, or payments in kind, including your own, for more than three months?, and iv) what was the first year the founders of the business received wages, profits, or payments in kind from this business?

[16] Thomson SDC Platinum database is extensively used in M&A research (e.g., Deutsch et al., 2007; Finkelstein and Haleblian, 2002).

[17] The 10% threshold level is used and suggested by several international institutions such as the OECD, IMF and UNCTAD.

[18] The individual transaction can be less than 10% of equity in the target firm, but if the acquiring firm accumulates at least 10% ownership (including previous deals with the same target), the total deal value is included in the FDI inflow variable.

[19] See Table 2-C-2 in the appendix C for the distribution of M&A deals over the sample years.

follow the usual practice as in Aggarwal et al., (2011), Asiedu (2002) and Kemeny (2010) and normalize the FDI variable with GDP[20] which is taken from the World Bank's (WB) World Development Indicators (WDI). M&A as well as GDP data is reported in current US dollars and cover the years 1999-2008. Thomson provides industrial classifications for its M&A, and these are aligned with those in the GEM.

Regarding the control variables in our analysis, a review of literature suggests a number of factors influencing national entrepreneurial activities. More importantly, the development level of a national economy, the institutional quality—perhaps best indicated by business regulations, and indicators of national culture are considered highly relevant (Acs et al., 2008; Autio et al., 2013; Hayton et al., 2002; Van Stel et al., 2007; Wennekers et al., 2005). Therefore, we chose the following control variables in the analysis. *GDP per capita* at purchasing power parity is extracted from WDI and it is in constant 2005 international dollars. We faced two difficulties associated with this as continuous variable: i) it has a bimodal distribution, and ii) it is highly correlated with other independent variables in the estimated models.[21] Therefore, GDP per capita is converted into five dummy variables. The chosen threshold levels are not theory-driven; rather we take a pragmatic approach which we believe to be the best available. The reference category dummy takes the value 1 if GDP per capita equals to US$ 11 500 or less. We chose the cut-off point such that the reference dummy is highly correlated with other independent variables. This procedure ensures that the reference dummy absorbs much of the multicollinearity so that remaining dummies are less related to other independent variables. As the reference category dummy is excluded from the regression, multicollinearity is not a serious issue anymore. The literature suggests that of the many (highly correlated) institutional variables influencing entrepreneurial entry, the complexity of business regulation is perhaps the most important (Djankov et al., 2002). *Business regulation* is defined as the total number of days[22] required to register a firm, derived from the WB's Doing Business division.

Variables capturing cultural characteristics are obtained from the World Values Surveys (WVS) which explore cross-national comparisons of culture, attitudes and beliefs[23] across the globe and how they evolve over time. Enhancing our understanding of national value structures, the WVS project has conducted a series of surveys[24] in different countries since 1981 and currently, this includes almost 100 nations and the majority of world's population.[25] The surveys provide the most comprehensive work of its kind, largely used in studies linking values and various factors; most notably economic outcomes (Berry et al., 2010; Inglehart and Baker, 2000; Kwon and Arenius, 2010). In this regard, it is suggested that two key measures cover markedly different aspects of personal values in a given national culture (Inglehart and Welzel, 2005). These are: *traditional values vs.*

[20] We also tried gross fixed capital formation and market capitalization of listed companies to normalize FDI inflows. However, due to multicollinearity we opted to proceed with GDP instead of these two variables.

[21] Several alternatives such as log transformation, inclusion of the quadratic term are experimented with to eliminate these problems. Unfortunately, none of them were effective.

[22] As an alternative, a cost variable comprising official fees and fees for legal and professional services as a percentage of GDP per capita is used from the same database. However, to avoid multicollinearity we decided not to use this cost variable.

[23] In fact the coverage of the WVS is much broader, the project provides a variety of measures in the areas of politics, diversity, religion, gender equality, environment, work, family etc.

[24] The WVS project has already conducted five surveys in the years 1981, 1990, 1995, 2000 and 2006 and at the time of writing the sixth wave was in the development stage. The data is publicly available via the project website. For each GEM country in the sample the average across all surveys is calculated.

[25] Nearly 90%, information is retrieved on October, 19 2014 from:
http://www.worldvaluessurvey.org/WVSContents.jsp

*secular-rational approach*, and ii) *survival vs. self-expression*. The traditional dimension of the first measure involves values such as respect for authority, strong religious practices and family ties, and self-identification with national pride. At the other end of the same spectrum, we witness principles like openness, collective decision making, a more global tendency and commitments towards relations outside the family circle. Concerning the dichotomy between survival and self-expression, the former is identified with food, housing, clothing, etc., while the latter places an emphasis on personal expression and self-development. Following the arguments raised by Hechavarria and Reynolds (2009), and Inglehart (2006) we include these two measures into the analysis to control for cultural factors that may potentially induce or inhibit entrepreneurship.

### *Instrumental Variables*

FDI inflows and domestic entrepreneurship at the country or industrial level may both be explained by some other set of variables omitted from our analysis. We therefore instrument FDI by identifying factors that might influence foreign investors but are unlikely to impact upon potential entrepreneurs from the host economy. We focus on two such factors: i) distance between the source and host economy, and ii) corruption. The former seems likely to be a valid instrument since the effect of geographic distance on transactions costs of FDI is well-established (Javorcik, 2004), but there is no mechanism for this in influencing domestic entrepreneurship. The argument for corruption rests in the view that domestic players are acclimatized to the institutional arrangements of the host economy better than outsiders, and that perhaps the most significant indicator of the institutional quality and the business environment from the perspective of foreign investors is the extent of local corruption (Mauro, 1995). The precise instruments used for the estimation of FDI inflows are: i) the weighted average geographic *distance*[26] between a host country and its M&A source countries in a given year. The weight for a particular source country is computed based on its M&A share within overall inflows targeting a country-year combination. This is applied at the aggregate and industry level. ii) The *control of corruption* index from the WB. It is defined as "perceptions of the extent to which public power is exercised for private gain".[27]

Good instruments must be uncorrelated with the error term of the original regression and good predictors of the variable being instrumented (Greene, 2011). There are no theoretical grounds to expect that domestic entrepreneurship levels will be responsive to varying degrees of bilateral distance. The distance variable is widely used in gravity models (Bevan and Estrin, 2004; Brainard, 1997; Carr et al., 2001) and is commonly used to predict FDI and trade flows between countries (Frankel and Romer, 1999; Lee, 1993). Therefore, our choice of bilateral distance as an instrument for FDI is well grounded in the literature. Furthermore, corruption is a multidimensional phenomenon affecting different business practices with different degrees of intensity. Husted (1999) indicates that national culture exerts strong influence on people's attitudes towards corruption. Studies linking cultural values to corruption agree that corruption levels prevailing in different countries are partially explained by national culture (Davis and Ruhe, 2003; Rose-Ackerman, 1999). Therefore, one purpose of adding cultural variables as controls in our original regression is to capture the facet of corruption specifically affecting

[26] Bilateral distance data is obtained from Mayer and Zignago (2011). Distance is calculated following the great circle formula, which uses latitudes and longitudes of the most important cities/agglomerations in terms of population. There are alternatives present for this variable from the same source.

[27] While data on control of corruption is available on an annual basis since 2002, before then the index is computed only once every two years covering 1996, 1998 and 2000. The relevant data is accessible via the WB at (retrieved on April, 22 2015): http://info.worldbank.org/governance/wgi/index.aspx#home.

the formation of domestic firms. On the other hand, the second instrument for FDI, control of corruption, is an *index* variable that is highly correlated with other macro variables such as the rule of law, property rights, etc. There is a considerable body of literature emphasizing the importance of such variables in attracting FDI inflows (Globerman and Shapiro, 2002; Pajunen, 2008) as well as cross-border M&A (Weitzel and Berns, 2006). As a result, our argument to use the control of corruption index as an instrument is intended to capture the overall investment climate in the host countries that influences foreign investors, rather than a particular level of corruption per se.

**Table 2-1:** Pairwise correlations

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| FDI/GDP | 1 | | | | | | | | |
| GDPpc 1 | -0.223 | 1 | | | | | | | |
| GDPpc 2 | -0.087 | (-0.424) | 1 | | | | | | |
| GDPpc 3 | 0.128 | -0.210 | -0.262 | 1 | | | | | |
| GDPpc 4 | 0.146 | -0.204 | -0.255 | -0.127 | 1 | | | | |
| GDPpc 5 | 0.137 | -0.269 | (-0.336) | -0.167 | -0.162 | 1 | | | |
| Business Registration | -0.210 | (0.442) | 0.031 | -0.111 | -0.211 | -0.278 | 1 | | |
| Survival Self-expression | (0.343) | (-0.414) | -0.229 | 0.186 | (0.342) | (0.323) | -0.244 | 1 | |
| Traditional Rational | 0.118 | (-0.534) | 0.159 | 0.279 | 0.198 | 0.015 | (-0.308) | 0.162 | 1 |

*Notes:* Correlations are based on model 3 in Table 2-3. The values greater than an absolute cut-off of 0.3 are shown in parentheses.

**Table 2-2:** Descriptive statistics

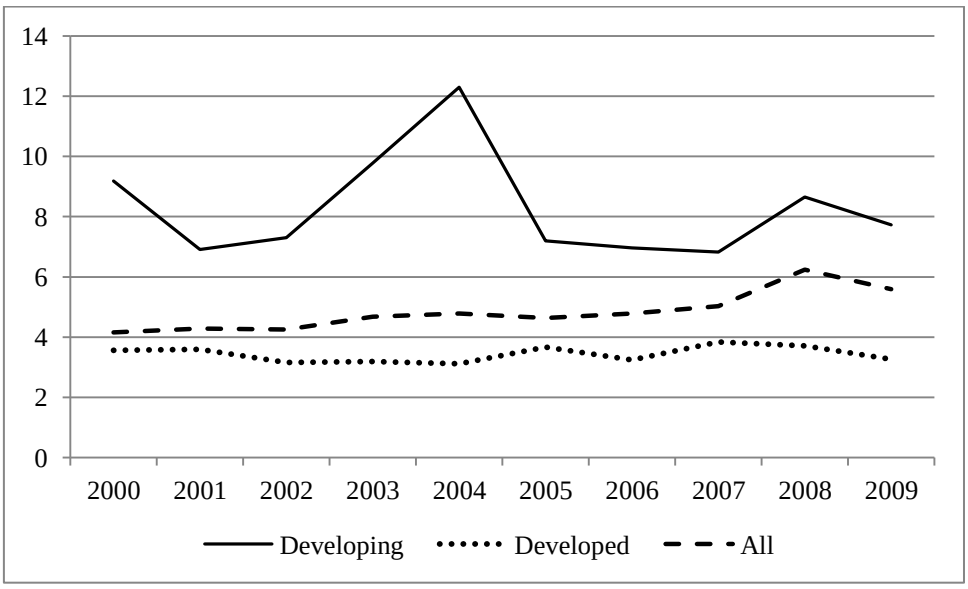
| VARIABLES | Obs. | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| Nascent entrepreneurship rate | 347 | 4.94 | 3.97 | 0.45 | 29.39 |
| New business ownership rate | 347 | 4.03 | 3.18 | 0.26 | 22.73 |
| Total early-stage entrepreneurship rate | 347 | 8.61 | 6.12 | 1.26 | 37.92 |
| FDI/GDP | 347 | 0.33 | 1.31 | -5.57 | 3.18 |
| Bilateral Distance | 347 | 5.92 | 1.09 | 3.76 | 9.66 |
| Control of Corruption Index | 347 | 0.97 | 1.06 | -1.32 | 2.59 |
| GDPpc 1 | 347 | 0.25 | 0.44 | 0 | 1 |
| GDPpc 2 | 347 | 0.35 | 0.48 | 0 | 1 |
| GDPpc 3 | 347 | 0.12 | 0.32 | 0 | 1 |
| GDPpc 4 | 347 | 0.11 | 0.31 | 0 | 1 |
| GDPpc 5 | 347 | 0.18 | 0.38 | 0 | 1 |
| Business Registration | 347 | 29.21 | 31.34 | 2 | 152 |
| Survival Self-expression | 347 | 0.38 | 0.84 | -1.62 | 1.82 |
| Traditional Rational | 347 | 0.06 | 0.92 | -1.75 | 1.74 |

*Notes:* Statistics are based on model 3 in Table 2-3. Independent variables are lagged by one year. FDI/GDP and bilateral distance are in log form.

In order to get some more insights on the data, the pairwise correlation matrix for the independent variables and summary statistics are presented in Tables 2-1 and 2-2. The highest correlations emerge due to the first GDP per capita dummy. Since this variable serves as the reference category in the analysis, such multicollinearity does not pose a concern in the interpretation of our results. Table 2-1 also shows that there are a few values exceeding the rule of thumb of 0.3, of which the cultural indicators are the main cause. While the *survival self-expression* dimension is positively correlated with *FDI/GDP* and the last two GDP per capita indicator variables at the magnitude of just over 0.3, the *traditional rational* aspect is negatively related to the number of days required to register a business with a comparable correlation coefficient. Furthermore, FDI is negatively associated with GDP per capita at lower income levels, with this being reversed as countries become wealthier. FDI also experiences lower amounts of inflows in states with an excessive regulatory burden in terms of the time needed for business registration. Finally, the correlation matrix suggests that when registering a firm, authorities are more demanding of time in countries at the early development phase. As the average income rises, an entrepreneur spends less time to comply with the regulations. In short, with the largest value observed at 0.343 in Table 2-1, we are confident that the correlations among the independent variables are at an acceptable level to yield reliable inferences from the results.

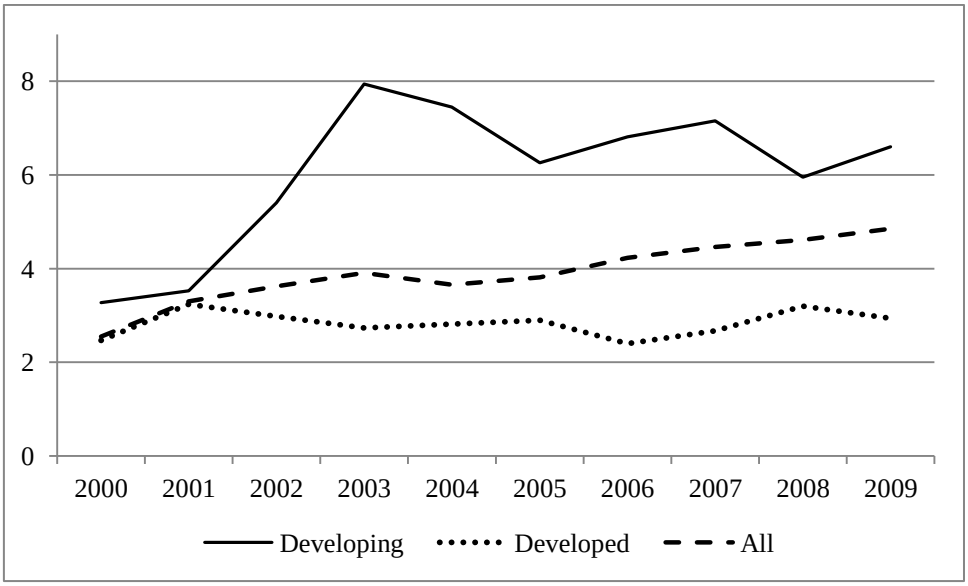
Table 2-2 reveals that the average nascent and new business ownership rates in the sample hover around 4%, with the former being somewhat larger. The total early-stage entrepreneurship rate accounts for the combination of the two which is equal to 8.61% on average. Due to the slight overlap between the nascent and new business ownership, this value is lower than the sum of the two individual measures. Figures 2-1, 2-2 and 2-3 provide detailed information on entrepreneurship data across developed and developing countries over the sample period.[28]

**Figure 2-1:** Average nascent entrepreneurship rate, by development stage (%)



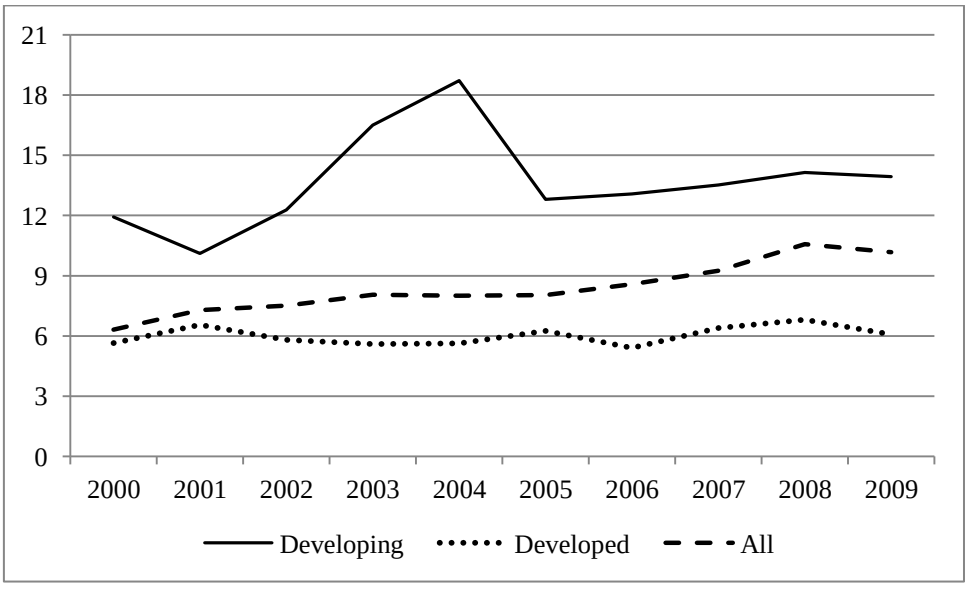

[28] Figures 2-1 through 2-5 are based on the sample used to estimate model 3 in Table 2-3.

**Figure 2-2:** Average new business ownership rate, by development stage (%)




The average nascent entrepreneurship rate in developing countries in the sample is higher than that of in developed nations in each year, as illustrated in Figure 2-1. Furthermore, the values corresponding to the former group are more volatile in the early years of the data, to some extent stabilizing after 2005. The fact that there are fewer developing economies in the sample in the pre-2006 period might explain the large fluctuation in the nascent entrepreneurship rate. For instance, while only Argentina and Brazil have entrepreneurship data in 2000, the number of developing countries in the analysis gradually increases over the years, reaching to 21 in 2009.[29] The average minimum and maximum values of nascent entrepreneurship for this cluster are equal to 6.819% in 2007 and 12.296% in 2004. The corresponding figures for the subsample of advanced countries are observed at 3.115% in 2004 and at 3.883% in 2007.

**Figure 2-3:** Average total early-stage entrepreneurship rate, by development stage (%)




[29] See Table 2-C-4 in the appendix C for the observation summary by income level over 2000-2009.

As Figure 2-2 shows, at the onset of the sample period the average new business ownership rates across the two income groups are comparable, realized at around 3%. Thereafter, developing countries take the lead with relatively large swings over the years. In contrast, the values for developed nations have a steady trend, reflecting the fact that the composition of this subsample is relatively stable over 2000-2009. Finally, Figures 2-1 and 2-2 demonstrate that nascent entrepreneurship rates are persistently higher than new business ownership rates both in developing and developed economies.

**Figure 2-4:** FDI inflows, by development stage (billions of US dollars)

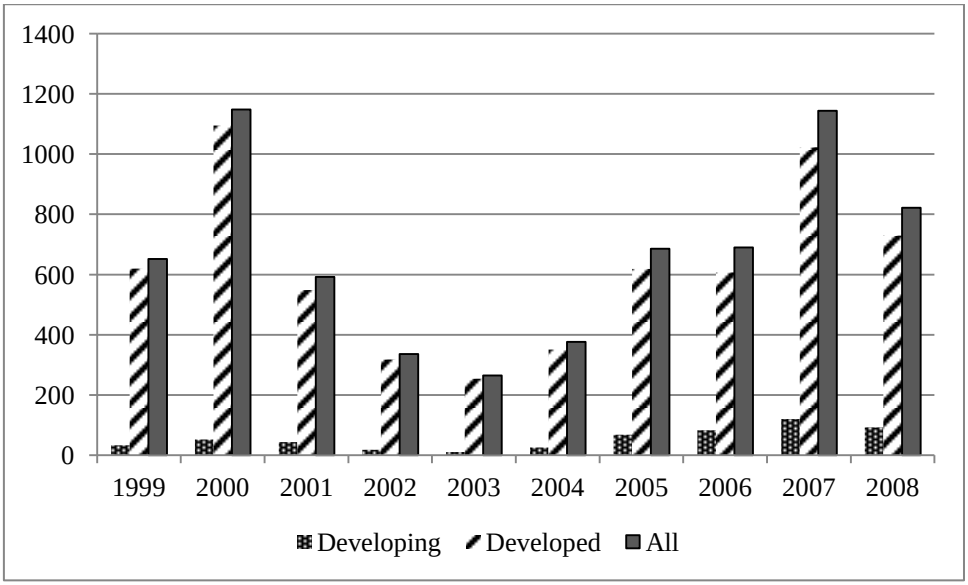



**Figure 2-5:** Average FDI inflows as a percentage of GDP, by development stage

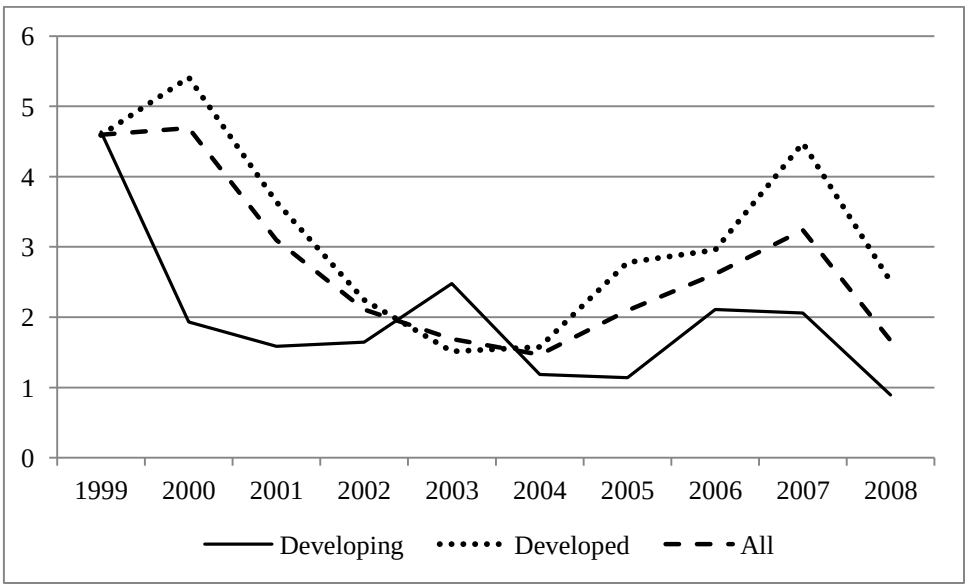



Figure 2-4 compares FDI inflows across the two country types over 1999-2008. What we observe is that advanced economies absorb substantially more FDI than their developing counterparts, peaking at $1094.96 billion in 2000. This is reasonable given high-income countries are represented nearly twice as much as low- and middle-income countries in the sample (230 versus 117 observations). Furthermore, as Navaretti and Venables (2004) indicate, they are more attractive destinations for foreign investors due to

the shortage of competent domestic firms for acquisition in developing countries. In this subsample, FDI inflows reach its highest level of $120.73 billion in 2007, approximately eleven times the lowest value realized in 2003.

As reflected by the descriptive statistics in Table 2-2, the average *FDI/GDP* for the whole sample is 2.58%, with the bottom and top values are measured at 0.004% (Slovenia in 2003) and 23.92% (Sweden in 1999). Although this aggregate record is useful, it disguises significant differences in FDI inflows as a share of GDP across country groupings. Figure 2-5 depicts this decomposition over 1999-2008. Having started from a similar position in 1999 (approximately 4.6%), the average *FDI/GDP* ratios for developed and developing economies follow divergent routes. The former always receives more inflows relative to their size compared to the latter with the exception of 2003. The values corresponding to this year are 1.5% and 2.5%, respectively. Furthermore, advanced countries attain the highest average FDI base (5.4%) in 2000 which is followed by a declining trend. After a period of downturn, FDI/GDP rebounded again in 2005 onwards but the ratio remained below the previous all-time high. The average FDI inflows to developing countries in relation to their size experienced multiple drops over 1999-2008. Even though the years 2003 and 2006 mark a recovery, the FDI/GDP ratio in the last year of the sample period stays below the peak level realized in 1999.

Besides entrepreneurship and FDI data, Table 2-2 also shows the summary statistics corresponding to the other variables used in the analysis. A representative country in the sample is moderately effective in combating corruption with a mean value of 0.97. Angola and Finland are rated as the most and least corrupt economies, respectively. Furthermore, it takes on average 29.21 days to get official approval for new business activities. While entrepreneurs in developing countries wait for 47.12 days for the completion of the business registration process, in developed countries it requires on average 20.1 days to accomplish the same task.

## 2.4. Estimation Methodology

Our base equation, estimated at three levels of aggregation, tests the relationship between domestic entrepreneurship, foreign direct investment and a variety of country and time specific control variables. The aggregate equations capture the sum of horizontal and vertical FDI effects across the economy as a whole, while the intra-sectoral estimates refer to horizontal FDI effects only. Provided that the classical assumptions hold true (e.g., homoscedasticity and no autocorrelation) (Greene, 2011), the ordinary least squares (OLS) regression is a reasonable tool to evaluate these relationships. However, in the presence of endogenous regressors OLS generates biased coefficients. The endogeneity of FDI is often noted in the literature which makes the use of OLS inappropriate (Navaretti and Venables, 2004). This estimation technique assumes that the disturbance term is orthogonal to the right-hand-side variables in the estimation model. In connection with FDI inflows, this condition may be invalid for two reasons. First, there could be a feedback effect from domestic entrepreneurship to FDI; the decision of foreign investors to enter a host country and the size of their investment projects tend to be responsive to the strength of the local entrepreneurial base. For instance, the evaluation of expected profits from overseas production hinges on the dynamism of domestic entrepreneurial activities. Foreign investors also consider whether the economy is vibrant enough to produce competent enterprises to meet their input demand as well as the complementarity between local skills (e.g., entrepreneurial talent) and the nature of business operations. Second, the assumption that the error term is uncorrelated with the explanatory variables is violated if unobserved and omitted factors (e.g., legal and institutional elements) affect both entrepreneurship and

FDI levels in host countries concurrently. In fact, the reported test statistics confirm that FDI must be treated as endogenous in our analysis. Under this circumstance, OLS yields spurious inferences. In order to address the issue of endogenous determination of FDI, previous studies extensively rely on instrumental variables, and implement the two-stages least squares (2SLS) estimator.[30]

2SLS involves a first-stage regression where endogenous variables are regressed on all the exogenous variables along with the instruments. In the second-stage, the original values of the endogenous regressors are supplanted by their fitted values obtained from the first regression. This two-stage procedure rectifies bias and inconsistency of OLS in the estimated coefficients by removing the part of the variation in the endogenous variable associated with the disturbance term. We therefore use two variations of two stage least squares (2SLS) as our estimator (also reporting OLS to indicate the bias) and we cluster the standard errors at the country level. The two 2SLS differ conditional upon the instrumental variables used in the first stage. Furthermore, we lag all independent variables by one year to further avoid potential simultaneity; as noted above a longer lag structure was too expensive in terms of degrees of freedom.

If *i* denotes countries and *t* denotes years, our second stage model (equation 2.1) and corresponding the first stage regression (equation 2.2) take the following forms:

$$\text{Entry}_{it} = \beta_0 + \beta_1 \text{FDI/GDP}_{it-1} + \beta_2 \text{GDPpc}_{it-1} + \beta_3 \text{Business\_Registration}_{it-1} + \beta_4 \text{Survival\_Self-expression}_{it-1} + \beta_5 \text{Traditional\_Rational}_{it-1} + u \quad (2.1)$$

$$\text{FDI/GDP}_{it-1} = \alpha_0 + \alpha_1 \text{Distance}_{it-1} + \alpha_2 \text{Corruption}_{it-1} + \alpha_3 \text{GDPpc}_{it-1} + \alpha_4 \text{Business\_Registration}_{it-1} + \alpha_5 \text{Survival\_Self-expression}_{it-1} + \alpha_6 \text{Traditional\_Rational}_{it-1} + \varepsilon \quad (2.2)$$

Depending on the estimated model, $Entry_{it}$ refers to one of the GEM measures of entrepreneurial activity discussed in the data section. $FDI/GDP_{it-1}$ is the main variable of interest, and represents FDI inflows via M&A which are normalized with respect to the GDP level of a particular country. Five dummy variables are created to control for GDP per capita ($GDPpc_{it-1}$).The variable $Business\_Registration_{it-1}$ reflects the total number of days required to register a firm, $Survival\_Self\text{-}expression_{it-1}$ and $Traditional\_Rational_{it-1}$ refer to the cultural variables. The control of corruption index[31] ($Corruption_{it-1}$) in the host country and bilateral weighted distance ($Distance_{it-1}$) serve as instruments to predict FDI inflows in the first stage regression along with other independent variables[32] from the

[30] See Alfaro et al., (2004), Durham (2004) and Lensink and Morrissey (2006). The generalized method of moments (GMM) in differences is also a commonly used estimator to deal with the endogeneity of FDI (Carkovic and Levine, 2005). However, this method causes many observations to be dropped in a (highly) unbalanced panel like ours, hampering the statistical validity of the estimation model.

[31] Due to data limitations, the missing values of this variable (corresponding to 1999 and 2001) are replaced with the average values of the neighbouring years. A similar adjustment is made for the variable business registration as it only exists from 2004 to 2012.

[32] 2SLS estimation technique uses all explanatory variables from the original model to predict the instrumented variable (FDI in our case) in the first stage regression, based on the assumption that they are exogenous. One may argue that this procedure raises problems as our independent variables may be endogenous. However, given the fact that we lag all right hand side variables by one year, we ensure that the explanatory variables are only weakly endogenous, if at all. In fact, this view is corroborated by respective statistical tests reported in the results section.

original model. The variables $FDI/GDP_{it-1}$ and $Distance_{it-1}$ are in logarithmic form because their distribution is non-normal.

We noted above that bilateral distance is theoretically exogenous to our original regression (equation 2.1) and the control of corruption index represents a set of related variables including the rule of law and property rights, which we believe to be important in cross-border investment decisions, but less so in domestic entrepreneurship. The reliability of our instruments will be tested in the following way. Where applicable, we present test statistics such as the over-identification test, the F-score of estimated models and the partial $R^2$ of our first stage regressions (equation 2.2). For robustness, we estimate equation 2.2 with both instruments (distance and corruption), and with distance as the only instrument.

Our paper studies the effects of FDI on domestic entrepreneurship over time at both the country level and country-industry level. Therefore, equation 2.1 is estimated separately at three layers of aggregation covering the whole sample and two industry breakdowns. At the first level of industry breakdown, the sample is allocated into four broad 'industry clusters', stemming from the GEM database. In the second disaggregation, we classify our data into 11 1-digit ISIC rev. 3 industries.

Entrepreneurship data used in this work is based on 4-digit ISIC rev. 3 industry classification whereas FDI data is available in 6-digit NAICS codes reflecting 2007 update of the scheme. Therefore, we needed to map the data from NAICS 2007 to ISIC rev. 3. This necessitated several data adjustments prior to the data allocation across individual industries. Methodological details of the data mapping between ISIC rev. 3 and NAICS 2007 codes are included in the appendix B. It also includes tables showing the composition of our industry groupings.

Our sample covers the years from 2000 to 2009 but is unbalanced with a total of 347 observations. We have two cultural variables that are time-invariant and a business registration variable that remains relatively stable over time. As a result, a fixed effects model appears to be less suitable as an estimation procedure. The sample countries that are included in the analysis are listed in Table 2-C-1 in the appendix C.

## 2.5. Estimation Results

We first report aggregate cross-country results before continuing in the second sub-section to present our findings on horizontal FDI effects based on two levels of industrial disaggregation.

### 2.5.1. Cross-Country Analysis: Overall FDI Effects

We used various dependent variables to capture different dynamics of entrepreneurship within the host economies. Equation 2.1 is therefore estimated separately for each measure of entrepreneurship using the 2SLS technique, and obtained results are reported in comparison with OLS. The former is estimated twice, conditional upon instrumental variables included in the first stage regression (equation 2.2). Given the number of models estimated, for brevity, we chose to report results in a parsimonious way in Tables 2-3 and 2-4.[33] Results obtained from OLS and two applications of 2SLS estimation using nascent entrepreneurship as the dependent variable are presented in Table 2-3. Column (1) shows OLS results while columns (2) and (3) report 2SLS estimations. In column (2), weighted

[33] Estimation results that are mentioned but are not reported here can be found in the appendix A as part of the robustness analysis.

bilateral distance between target and acquirer countries is the only instrumental variable used to predict lagged FDI in the first stage regression. When the control of corruption index is included as an additional instrument to the first stage estimation, the relevant 2SLS results are shown in column (3). Table 2-3 reveals a small difference in lagged FDI coefficients between columns (2) and (3). However, when the OLS and 2SLS coefficients are compared, a much larger change, approximately 6-fold, is reported. This indicates that there may be a positive correlation between FDI and the error term in the OLS regression. Furthermore, as we discover later, the standard errors on the FDI variable in the 2SLS models are larger, however not as much as the coefficients themselves. This is unsurprising, because standard errors in IV differ from OLS only in the $R^2$ of the first stage regression; and as the $R^2$ is less than 1, the IV standard errors are larger.

The aggregate results indicate that the relationship between lagged FDI and nascent entrepreneurship is negative, and this finding is consistent across all specifications in Table 2-3. Furthermore, the negative effect of the FDI variable is significant at the 1% level in the 2SLS regressions and at the 10% level in the OLS. Our results provide evidence that, at the cross-country level, negative effects stemming from the previous year's FDI compensate for potential positive effects. Robustness checks with a two period lag also do not qualitatively change our main results.[34]

We checked the endogeneity of the FDI variable by computing the difference between OLS and 2SLS estimators and obtained a test statistic with a p-value less than 0.001 for both models reported in columns (2) and (3) of Table 2-3. Here, the null hypothesis is that the FDI variable is exogenous to the regression's disturbance term. Table 2-3 also includes the partial $R^2$ between FDI and its fitted values in the first stage regression as a measure of instrument relevance. The value of this statistic equals 0.1881 and 0.2551 for the 2SLS models presented in columns (2) and (3), respectively. Finally, we checked for over-identification by testing whether the instrumental variables are uncorrelated with the residuals, which is necessary in order to qualify their validity as instruments. As reported at the bottom of column (3), the p-value corresponding to the over-identification test is ≈0.9, indicating that the instruments satisfy this criterion.

We also explored whether the negative association between entrepreneurship and FDI is economically meaningful.[35] The OLS regression findings imply that a 10% increase in FDI affects the nascent entrepreneurship rate in the host economy by -0.0314%.[36] Likewise, results obtained from 2SLS models suggest a 0.1874% and 0.1840% decline in the level of entrepreneurship, respectively. To compute the economic significance of FDI effects, we assume that the FDI measure increases by one standard deviation (that is 0.786). Holding other explanatory variables in 2SLS models in columns (2) and (3) at their averages, this translates into a reduction of the nascent entrepreneurship rate by 0.015% and 0.014%, respectively.[37] Given the standard deviation of nascent entrepreneurship is equal to 3.97, the magnitude of this decrease suggests that the negative economic effect of FDI is limited.

We control for the level of economic development by including five dummy variables. The construction of indicator variables was necessary to address the variable's bimodal distribution and multicollinearity. As we move through columns (1)-(3) in Table

[34] As above.

[35] Note that the FDI variable is subject to logarithmic transformation. The interpretation of relevant coefficients alters accordingly.

[36] In a level-log model $\Delta y = (\beta_1 / 100)\%\Delta x$ where y is the dependent and x is the independent variable.

[37] These values are calculated by multiplying the coefficient on the FDI variable with its standard deviation; that is 0.01874 x 0.786 = 0.015 for column (2) and 0.01840 x 0.786 = 0.014 for column (3).

**Table 2-3:** Aggregate results using nascent entrepreneurship rate

| | OLS<br>(1) | 2SLS<br>(2) | 2SLS<br>(3) |
|---|---|---|---|
| FDI/GDP | -0.314* | -1.874*** | -1.840*** |
| | (0.158) | (0.540) | (0.419) |
| GDPpc 2 | -3.180*** | -2.996*** | -3.000*** |
| | (0.873) | (0.833) | (0.840) |
| GDPpc 3 | -3.883*** | -3.251*** | -3.264*** |
| | (0.950) | (1.008) | (1.015) |
| GDPpc 4 | -4.183*** | -3.741*** | -3.751*** |
| | (1.003) | (1.046) | (1.058) |
| GDPpc 5 | -3.722*** | -3.377*** | -3.384*** |
| | (1.037) | (1.178) | (1.179) |
| Business Registration | 0.001 | -0.006 | -0.005 |
| | (0.018) | (0.012) | (0.012) |
| Survival Self-expression | 0.965*** | 1.611*** | 1.597*** |
| | (0.314) | (0.501) | (0.492) |
| Traditional Rational | -1.707*** | -1.720*** | -1.719*** |
| | (0.309) | (0.367) | (0.364) |
| Constant | 7.405*** | 7.626*** | 7.621*** |
| | (0.926) | (0.836) | (0.816) |
| Observations | 347 | 347 | 347 |
| Countries | 70 | 70 | 70 |
| Partial $R^2$ (first stage) | | 0.1881 | 0.2551 |
| F-stat (first stage) | | 35.44 | 33.42 |
| Endogeneity | | 0.0005 | 0.0000 |
| Over-identification | | | 0.9109 |
| Under-identification | | 0.0001 | 0.0000 |
| Weak-identification | | 0.0000 | 0.0000 |
| $R^2$ | 0.454 | 0.226 | 0.236 |
| F-stat | 7.922 | 6.178 | 7.052 |

*Notes:* The dependent variable is the nascent entrepreneurship rate at the country level. All independent variables are lagged by one year. The estimation method is OLS in column (1), and 2SLS in columns (2) and (3). In column (1), the FDI/GDP variable is in its original values (in log). In columns (2) and (3), the predicted values of FDI/GDP (in log) from the first-stage regressions are used. The bilateral distance (in log) is the only instrumental variable used to predict the lagged FDI/GDP in the first stage regression in column (2). In column (3), both the bilateral distance and the control of corruption index serve as instruments. GDPpc 2, GDPpc 3, GDPpc 4 and GDPpc 5 are GDP per capita dummies (constant 2005 international dollars). Endogeneity is the Durbin-Wu-Hausman test; over-identification is the Hansen J statistic; under-identification is the Kleibergen-Paap rk test; and weak-identification is the Anderson-Rubin test. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

2-3, we find consistency in the results suggesting that higher levels of GDP per capita are negatively associated with nascent entrepreneurship. Furthermore, this negative link is statistically significant at the 1% level. This is consistent with the literature (e.g., Aidis et al., 2012). As a robustness check, the models in Table 2-3 are estimated with the logarithmic and quadratic forms of GDP per capita to capture potential non-linearities. We also altered the number of dummy variables and cut-off points for GDP per capita. The results obtained from these alternative specifications do not differ qualitatively from those reported in Table 2-3. Furthermore, we ran additional robustness checks by replicating the analysis in Table 2-3 with the subsamples of OECD and non-OECD countries. Again, we obtain similar results for both groups of countries. [38]

The control variable capturing the length of time required for business registration does not exhibit statistical significance in any model in Table 2-3, though the sign of the coefficient is intuitive in columns (2) and (3). Regarding the two cultural variables, positive values on the traditional vs. secular-rational spectrum indicate more secular-rational orientation, whereas negative values indicate stronger ties with traditions. Similarly, positive values on the survival vs. self-expression range mirror priorities related to personal development, while negative values put more weight on the survival aspect. The results in Table 2-3 suggest that a national emphasis on traditional and self-expressive values is associated with greater nascent entrepreneurship activity. Both cultural variables are statistically significant at the 1% level across all specifications.

In summary, as the test statistics in columns (2) and (3) indicate, the lagged FDI variable is correlated with the error term, so OLS is not the optimal estimator to evaluate our predictions. Based on the estimation results and test statistics such as the partial $R^2$ of the first stage regressions and the F-scores, the appropriate specification is the 2SLS model with two instrumental variables (column (3) in Table 2-3). For brevity, we do not report the estimation results obtained from OLS and 2SLS regressions where bilateral distance is the only instrument, because the results are qualitatively very similar to Table 2-3.[39] All estimation results presented hereafter refer to the 2SLS model with bilateral distance and corruption index as instruments for the FDI variable as our base specification.

In Table 2-4, we provide results from our 2SLS base model using the alternative entrepreneurship measures. The coefficients on the lagged FDI variable presented in Table 2-4 have a similar pattern to that of Table 2-3 regarding the direction of the relationship with entrepreneurship, although coefficients vary quantitatively across columns (1) through (3). For all specifications, we find a negative and statistically significant effect of FDI inflows. When we compare the effect of FDI on nascent entrepreneurship (column (1)) and on new business ownership (column (2)), we see a decline in FDI's negative effect. This indicates that the younger is the start-up, the stronger are the negative effects of FDI. In fact, while a 10% increase in FDI in the previous year is associated with a 0.1840% decline in nascent entrepreneurship, the decrease in new business ownership is 0.0847%. The corresponding value for total early-stage entrepreneurship rate is 0.2580%.

Once again, it is interesting to analyse the economic importance of these point estimates. If we assume that the FDI variable increases by one standard deviation (that is 0.786), this will affect new and total early-stage entrepreneurship activities by -0.007% and -0.02%, respectively. These numbers are relatively small in comparison to standard deviations of relevant entrepreneurship measures.[40] Most control variables follow a similar

[38] For these additional results, please see the section for robustness checks.
[39] As above.
[40] These are 3.18 and 6.12, respectively.

pattern to those presented in Table 2-3. Therefore, we will not further elaborate on them here.

**Table 2-4:** 2SLS aggregate results

| | 2SLS (1) | 2SLS (2) | 2SLS (3) |
|---|---|---|---|
| FDI/GDP | -1.840*** | -0.847** | -2.580*** |
| | (0.419) | (0.352) | (0.631) |
| GDPpc 2 | -3.000*** | -3.291*** | -5.918*** |
| | (0.840) | (0.988) | (1.495) |
| GDPpc 3 | -3.264*** | -3.799*** | -6.764*** |
| | (1.015) | (1.129) | (1.761) |
| GDPpc 4 | -3.751*** | -3.819*** | -7.186*** |
| | (1.058) | (1.156) | (1.858) |
| GDPpc 5 | -3.384*** | -3.471*** | -6.558*** |
| | (1.179) | (1.075) | (1.892) |
| Business Registration | -0.005 | -0.004 | -0.010 |
| | (0.012) | (0.007) | (0.012) |
| Survival Self-expression | 1.597*** | 0.802** | 2.247*** |
| | (0.492) | (0.356) | (0.754) |
| Traditional Rational | -1.719*** | -0.786** | -2.388*** |
| | (0.364) | (0.338) | (0.590) |
| Constant | 7.621*** | 6.790*** | 13.810*** |
| | (0.816) | (0.994) | (1.465) |
| Observations | 347 | 347 | 347 |
| Countries | 70 | 70 | 70 |
| Partial $R^2$ (first stage) | 0.2551 | 0.2551 | 0.2551 |
| F-stat (first stage) | 33.42 | 33.42 | 33.42 |
| Endogeneity | 0.0000 | 0.0088 | 0.0000 |
| Over-identification | 0.9109 | 0.8594 | 0.9855 |
| Under-identification | 0.0000 | 0.0000 | 0.0000 |
| Weak-identification | 0.0000 | 0.0320 | 0.0000 |
| $R^2$ | 0.236 | 0.298 | 0.322 |
| F-stat | 7.052 | 7.109 | 9.487 |

*Notes:* The dependent variable is the nascent entrepreneurship rate in column (1), the new business ownership rate in column (2) and the total early-stage entrepreneurship rate in column (3). All independent variables are lagged by one year. The estimation method is 2SLS. In all models, the predicted values of FDI/GDP (in log) from the first-stage regressions are used where the bilateral distance (in log) and the control of corruption index serve as instruments. GDPpc 2, GDPpc 3, GDPpc 4 and GDPpc 5 are GDP per capita dummies (constant 2005 international dollars). Endogeneity is the Durbin-Wu-Hausman test; over-identification is the Hansen J statistic; under-identification is the Kleibergen-Paap rk test; and weak-identification is the Anderson-Rubin test. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

### 2.5.2. Industry-Level Analysis: Horizontal FDI Effects

In this subsection, we assess how domestic entrepreneurship by country in different industries responds to lagged FDI by country and sector. We use the same specification as in Table 2-4, though with variables within each country disaggregated by sector; that is we use the 2SLS specification of Table 2-3 column (3) with the bilateral distance and the corruption index as instruments for the industrial FDI variable (equation 2.1).

Commencing with 'industry clusters'[41], we focus on whether horizontal FDI inflows into a given industry have an impact on domestic entrepreneurship within the same industry.[42] The 2SLS model is estimated for each industry and the results are reported in Table 2-5. The dependent variable in these regressions is the host country's annual total early-stage entrepreneurship rate by industry.

Table 2-5 reveals that the estimates at the industry level on the lagged FDI variable are qualitatively comparable to those obtained using the full sample although the significance and size of the effect vary. We find negative and significant relationships between entrepreneurship in an industry and FDI into that industry in all specifications in Table 2-5 except for extractive industries, for which the relationship is of the same sign but insignificant.[43] Hence, speaking in Granger-causality terms, the results suggest that FDI has negative horizontal spillover effects on domestic entrepreneurship in most of the industries considered.

For transformative industries, column (1) shows that if horizontal FDI in the previous year increases by 10%, the level of total early-stage entrepreneurship in the following year drops by 0.0652% and this impact is significant at the 1% level. Similarly, the entrepreneurship rate decreases in consumer-oriented industries and business services by 0.1062% and 0.0236%, respectively, as horizontal FDI increases by 10%. Although a statistically significant association is not detected for extractive industries, the direction of the effect is consistent with our other estimates.

If horizontal FDI in the transformative industries increases by one standard deviation (that is 0.843), the entrepreneurship rate in the same industry cluster drops by 0.005. The corresponding effects on domestic entrepreneurship in consumer-oriented industries and business services are -0.007 and -0.02, respectively. Given that the average total early-stage entrepreneurship rate across these three industry clusters is equal to 2.06, the negative economic effect of horizontal FDI is, again, quite small. Table 2-5 also includes test statistics, such as over-identification and the partial $R^2$, which are pertinent in the context of 2SLS applications.

We also analysed intra-industry (horizontal) effects of FDI on domestic entrepreneurship using more disaggregated data. Here, the four 'industry clusters' are disaggregated into 11 1-digit ISIC rev.3 industries.[44] We use the 2SLS base specification (column (3) in Table 2-3), with bilateral distance and corruption index (equation 2.1) for estimations within each 1-digit industry, using nascent, new and total early-stage entrepreneurship as dependent variables.

Though the models were estimated for each of 11 1-digit industries, the lack of observations for some models led to poor estimation results in the first-stage regressions. For example, in agriculture, we have an average of 2.4 M&A deals per country-year combination. We therefore report the subset of 1-digit industry results that meet the criterion where the F-statistics of the estimated model is statistically significant at the 5% level. The results on the intra-industry effects for these 1-digit industries that satisfy our econometric criterion are reported in Table 2-6. We present the coefficients of the lagged,

[41] See Table 2-B-1 in the appendix B for detailed information regarding the composition of each industry cluster.

[42] There are also single-country studies focusing on the vertical effects of FDI. This type of analysis, however, requires detailed information on the inter-industry linkages, preferably over time, for each of the sample countries. Unfortunately, there is no such data available for all the countries in the sample. Therefore, this paper is particularly concerned with the effects of horizontal FDI inflows on domestic entrepreneurship.

[43] The impact of the control variables is also in line with the analysis of the aggregate data.

[44] For more information regarding the industry composition, see Table 2-B-2 in the appendix B.

second-stage FDI variable, as the effects of control variables are largely in line with the previously reported results.

**Table 2-5:** 2SLS results based on industry clusters: Intra-industry FDI effects

| | Transformative | Consumer-Oriented | Business-Services | Extractive |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| $FDI/GDP_{\_Horizontal}$ | -0.652*** | -1.062** | -0.236* | -0.049 |
| | (0.229) | (0.524) | (0.130) | (0.056) |
| GDPpc 2 | -1.112** | -4.005*** | 0.037 | -0.403*** |
| | (0.450) | (1.104) | (0.210) | (0.152) |
| GDPpc 3 | -1.430*** | -4.686*** | -0.158 | -0.679*** |
| | (0.547) | (1.147) | (0.332) | (0.211) |
| GDPpc 4 | -1.661*** | -4.412*** | -0.267 | -0.762*** |
| | (0.543) | (1.260) | (0.403) | (0.244) |
| GDPpc 5 | -1.775*** | -4.717*** | 0.021 | -0.733*** |
| | (0.564) | (1.317) | (0.334) | (0.227) |
| Business Registration | 0.001 | -0.008 | -0.005** | -0.003** |
| | (0.004) | (0.008) | (0.002) | (0.002) |
| Survival Self-expression | 0.654*** | 0.783** | 0.513*** | 0.208** |
| | (0.221) | (0.350) | (0.155) | (0.091) |
| Traditional Rational | -0.512*** | -0.759*** | -0.222** | -0.042 |
| | (0.185) | (0.257) | (0.086) | (0.059) |
| Constant | 3.497*** | 4.227*** | 1.119*** | 0.889*** |
| | (0.508) | (1.528) | (0.247) | (0.182) |
| Observations | 286 | 234 | 258 | 199 |
| Countries | 59 | 50 | 58 | 50 |
| Partial $R^2$ (first stage) | 0.1743 | 0.0683 | 0.1849 | 0.1075 |
| F-stat (first stage) | 12.16 | 8.19 | 20.39 | 7.22 |
| Endogeneity | 0.0004 | 0.0236 | 0.0219 | 0.5104 |
| Over-identification | 0.7574 | 0.2842 | 0.3748 | 0.3922 |
| Under-identification | 0.0013 | 0.0135 | 0.0003 | 0.0084 |
| Weak-identification | 0.0002 | 0.0134 | 0.0586 | 0.2665 |
| $R^2$ | 0.146 | 0.134 | 0.122 | 0.187 |
| F-stat | 5.588 | 8.068 | 6.043 | 1.646 |

*Notes:* The dependent variable is the total early-stage entrepreneurship rate at the industry level. All independent variables are lagged by one year. The estimation method is 2SLS. In all models, the predicted values of $FDI/GDP_{\_Horizontal}$ (in log) from the first-stage regressions are used where both the bilateral distance (in log) and the control of corruption index serve as instruments. FDI inflows in the transformative industries are normalized by the total value added in mining, manufacturing, construction, electricity, water, and gas supply (ISIC rev. 3 divisions 10-45). FDI inflows in the consumer-oriented sectors and business services are normalized by the total value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services (ISIC rev. 3 divisions 50-99). The total value added in forestry, hunting, and fishing, as well as cultivation of crops and livestock production (ISIC rev. 3 divisions 1-5) is used to normalize FDI inflows in the extractive industries. GDPpc 2, GDPpc 3, GDPpc 4 and GDPpc 5 are GDP per capita dummies (constant 2005 international dollars). Endogeneity is the Durbin-Wu-Hausman test; over-identification is the Hansen J statistic; under-identification is the Kleibergen-Paap rk test; and weak-identification is the Anderson-Rubin test. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

The results in Table 2-6 suggest that the intra-industry effect of lagged FDI on domestic entrepreneurship within 1-digit industries is negative and significant for two (one) industries out of the five for nascent (total early-stage) entrepreneurship. Furthermore, as we see in Panel A, this negative link is more pronounced within the manufacturing industry.

**Table 2-6:** 2SLS results based on 1-digit industries: Intra-industry FDI effects

| Dependent variable | Nascent Entre. (1) | New Entre. (2) | Total Early Stage Entre. (3) |
|---|---|---|---|
| **PANEL A** | | | |
| [a] Manufacturing$_{_Horizontal}$ | -0.269** | -0.089 | -0.342** |
| | (0.128) | (0.060) | (0.161) |
| Observations | 255 | 273 | 273 |
| Over-identification | 0.6024 | 0.9014 | 0.6296 |
| **PANEL B** | | | |
| [b] Finance-Insurance-Real Estate$_{_Horizontal}$ | 0.020 | -0.032 | -0.023 |
| | (0.019) | (0.022) | (0.324) |
| Observations | 231 | 249 | 249 |
| Over-identification | 0.1574 | 0.2412 | 0.1302 |
| **PANEL C** | | | |
| [c] Business Services$_{_Horizontal}$ | -0.091 | -0.128 | -0.209 |
| | (0.068) | (0.089) | (0.145) |
| Observations | 203 | 221 | 221 |
| Over-identification | 0.5142 | 0.4021 | 0.8543 |
| **PANEL D** | | | |
| [d] Transportation-Communication-Utilities$_{_Horizontal}$ | -0.046 | -0.038 | -0.079 |
| | (0.032) | (0.026) | (0.054) |
| Observations | 233 | 250 | 250 |
| Over-identification | 0.8360 | 0.7515 | 0.7227 |
| **PANEL E** | | | |
| [e] Health-Education-Social Services $_{\_Horizontal}$ | -0.084** | -0.091 | -0.173 |
| | (0.039) | (0.062) | (0.106) |
| Observations | 106 | 116 | 116 |
| Over-identification | 0.4993 | 0.4401 | 0.3354 |

*Notes:* The relevant dependent variable is displayed at the top of each column. The estimation method is 2SLS. In all models, the predicted values of FDI/GDP$_{_Horizontal}$ (in log) from the first-stage regressions are used where both the bilateral distance (in log) and the control of corruption index serve as instruments. Only the coefficients and standard errors corresponding to the FDI/GDP$_{_Horizontal}$ variable are reported. [a] covers ISIC rev. 3 divisions 15-37, [b] covers divisions 65-67 and 70, [c] covers divisions 71-74, [d] covers divisions 40-41, 60-64 and 90, [e] covers divisions 75, 80 and 85. Over-identification is the Hansen J statistic. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

### 2.5.3. Robustness Analyses

We perform several robustness checks based on the models in Table 2-3 which serve as the foundation for the subsequent analyses in Tables 2-4 through 2-6. In Table 2-3, OLS results are compared to two versions of the 2SLS estimator, and we concluded that the 2SLS model using the bilateral distance and control of corruption index as instruments for the lagged FDI variable is the appropriate specification. The dependent variable is nascent entrepreneurship rate in Table 2-3. We revisit these three models here, and use the

alternatives of both the right-hand- and left-hand-side variables as well as different subsamples to ensure the findings are not driven by the choice of measures and samples. The robustness of our results is checked in two steps. First, we keep the outcome variable unchanged while employing alternative explanatory variables. These findings are presented in Tables 2-A-1 and 2-A-2. In the second step, both dependent and independent variables are altered, and the results are displayed in Tables 2-A-3 and 2-A-4.[45]

First, we analysed whether time effects matter by including year dummies in the models (1 through 3) in Table 2-A-1, where the focus is on the cross-county analysis with nascent entrepreneurship serving as the dependent variable. Time dummies account for any time-varying non-observable factors affecting the relationship between FDI and entrepreneurship. As reported in columns (1 through 3) in Table 2-A-1, the addition of dummies causes the size of the coefficients on FDI to increase without changes in significance levels compared to those reported in Table 2-3. Therefore, we demonstrate that our aggregate results are robust to controlling for time effects. Please note that the time dummies are kept in the subsequent models to ensure the same de-trending occurs across Tables 2-A-1 and 2-A-2.

Second, time lags allow for the analysis of time-dependent interactions between the outcome and explanatory variables. Therefore, in columns (4 through 6) in Table 2-A-1, the two-year lagged FDI is included to capture the effects of any time delay of more than one year which is used in the original specifications in Table 2-3. Coefficients on FDI variables in both 2SLS models decrease slightly without changes in significance in columns (4 through 6), Table 2-A-1. Therefore, we find that our aggregate results are not sensitive to the lag structure of the FDI variable.

GDP per capita has a bimodal distribution and is markedly correlated with other right-hand-side variables in Table 2-3. These issues are alleviated by converting the continuous variable into five dummies whose cut-off points are not theory- but data-driven. Therefore, the next robustness check investigates whether our results are determined by the choice of threshold values of real income. In short, GDP dummies are replaced with log terms in columns (7 through 9), and with quadratic terms in columns (10 through 12) in Table 2-A-1 to capture possible curvilinear effects of FDI on entrepreneurship. Likewise, in columns (1 through 3) in Table 2-A-2, income differentials across sample countries are represented with a dummy variable distinguishing developed and developing countries.[46] Again, we find no substantial changes to the previous results at the country level.

Until now, we have focused on the robustness checks by altering the right-hand-side variables while retaining our original dependent variable; nascent entrepreneurship rate. A potential bias in results may arise due to the use of different dependent variables. Therefore, in Tables 2-A-3 and 2-A-4, we replicate previous robustness tests using high-growth entrepreneurship as the outcome variable. This measure of entrepreneurship is defined as the percentage of total early-stage entrepreneurial activity that expects to employ at least five employees five years from now. As shown, overall results in Tables 2-A-3 and 2-A-4 are highly consistent with previously discussed robustness checks, so we will not elaborate on every detail rather we focus on the key aspects. Two conclusions emerge from the analysis. First, with regard to the whole sample, the negative effect of FDI

[45] Tables for robustness analyses are included in the appendix A.

[46] The World Bank defines low-income economies as those with a GDP per capita of $1 045 or less; middle-income economies as those with a per capita income of more than $1 045 but less than $12 746; and high-income economies as those with an income of $12 746 or more. Lower- and upper-middle-income economies are separated at a GDP per capita of $4 125. The term *developing* is used commonly to denote low- and middle-income countries so we follow the WB practice in our country classification.

diminishes markedly when high-growth entrepreneurship is used instead of nascent rate. For example, the size of the coefficient on FDI in column (3) in 2-A-3, the preferred specification of the study, decreases almost three-fold compared to the one reported in column (3) in 2-A-1 (-0.745 and -2.081 respectively). Second, when subsamples are considered, the negative FDI impact weakens substantially for developing countries, but less so for developed nations. (See the coefficient on FDI in column (15) in Tables 2-A-2 and 2-A-4 for developing countries. Similarly, see column (12) in Tables 2-A-2 and Tables 2-A-4 for the subgroup of developed economies.)

Finally, the aforementioned robustness checks are further replicated: i) at the cross-country level using the total early-stage entrepreneurship rate as the dependent variable, and the results are shown in Tables 2-A-5 and 2-A-6, and ii) at the industry level using the same outcome variable for transformative industries and business services. We present the results in Tables 2-A-7 and 2-A-8 (for transformative); and in Tables 2-A-9 and 2-A-10 (for business services) in the appendix A.

Robustness results obtained from these additional analyses largely corroborate those reported earlier with one exception. In the developing country subsamples, the negative FDI effects fade away both in the transformative (columns (13) through (15) in Table 2-A-8) and business services (columns (13) through (15) in Table 2-A-10). Possible reasons for these results are two-fold. First, these industries may not receive as much FDI via M&A entry, due to perhaps, the scarcity of target firms in developing countries (Navaretti and Venables, 2004); alternatively, they may attract greenfield projects. Unfortunately, data on FDI via the greenfield route at such a disaggregated level is unavailable to draw firm conclusions. Second, industry-level robustness checks employ total early-stage entrepreneurship rate as the dependent variable. This measure captures not only nascent entrepreneurs but also new business owners who have already survived the initial stages of starting a business, and therefore may be more resilient to FDI in developing countries, but less so in developed nations.

To conclude, we find that our results are largely robust to the inclusion of time effects, different lag structure of the FDI variable, alternative measures of GDP per capita and the use of different subsamples.

### 2.5.4. Limitations

This study has some limitations that need to be considered. The first is related to the instrumental variables that we use. Concerns about the causality between FDI and the performance of host countries including economic growth and productivity levels are well-established in the literature. Disentangling causal relationships, however, necessitates good instruments which are often not readily available. It is even more difficult to obtain valid instruments for a cross-country dataset. This study required instruments that explain cross-country, over time differences in FDI but are uncorrelated with the rates of domestic entrepreneurship beyond their link to FDI. Bilateral distance between home and host countries serves this purpose well, as it is theoretically exogenous to domestic entrepreneurship. One immediate problem that arises is that distance is constant whereas cross-country differences vary over time. Therefore, distance is made time-varying through using weights that are computed based on FDI shares within overall inflows targeting a host country in a given year. Put differently, distance as an instrument is weighted by the endogenous variable itself. While we acknowledge this limitation, various tests are conducted in this paper, which leads us to have sufficient confidence in the validity of this instrument.

The second limitation concerns the cultural variables used in the regressions. Culture is inherently resistant to change and fosters continuity; that is it varies very little over time. Therefore, available data on cultural differences across countries often lacks a time dimension. This poses a common limitation to many studies, including ours, utilizing differentials across time for other variables along with relatively stable cultural measures.

Third, our results report robust standard errors adjusted for clustering by country to control for time-series dependence. A complementary treatment would be adding country dummies into the estimation models. However, this would quickly exhaust degrees of freedom and would result in a severe collinearity problem. Therefore, we did not implement this procedure.

## 2.6. Conclusions

In this paper, we investigated the effects of FDI via M&A on domestic entrepreneurship. The literature suggests that FDI could either stimulate or inhibit local entrepreneurship. While foreign enterprises bring knowledge and superior technology that can penetrate the local economy, they are also the source of increased competition in product and factor markets while potentially raising the opportunity cost of entrepreneurship compared to wage-employment. The direction of the response of domestic entrepreneurship to FDI inflows relies on whichever of these two effects dominates in the local economy.

Using data that covers both developed and developing countries over the period 2000-2009, we find that FDI via M&A has a negative and significant effect on domestic entrepreneurship at the aggregate level. We further split our data into subsamples at two levels of disaggregation depending on the industry type. Our industry level estimates are consistent with the aggregate results, namely, there is evidence of negative intra-industry effects of FDI on domestic entrepreneurship. These results are shown to be robust to alternative specifications of the dependent variable, as well as to different strategies for instrumenting FDI for addressing potential endogeneity. This raises the question; how do we explain the negative impact of FDI on entrepreneurship?

The literature suggests that the competition effect is the principal source of crowding-out in the intra-industry context. Foreign and domestic firms compete directly in product markets. If local enterprises fail to adopt superior technologies or to improve their productivity in response to the increased competition from the foreign entrant, they will be forced to exit the market. On the other hand, positive intra-industry FDI effects may be limited because this type of knowledge diffusion, if it takes place, would convey advantages to domestic competitors. Hence, foreign firms have strong incentives to keep their technologies and management practices secret from domestic firms within the same industry.

The majority of FDI inflows in our dataset are heavily concentrated on the transformative (mainly manufacturing) and service sectors, rather than the extractive industries. The negative effects of the FDI inflows on domestic entrepreneurship are also more pronounced in the former groups of industries. As a result, although we do not directly test the competition effects on domestic entrepreneurship, the results are suggestive of the fact that the FDI-induced competition seems to dominate the benefits of knowledge diffusion particularly in transformative and service industries. On the other hand, when the competition between foreign and local firms is limited—as in the extractive industries, the crowding-out effect of FDI inflows is not significant.

An alternative explanation is related to the use of the local resources. Foreign firms enter a host economy so that they can benefit from assets peculiar to localities (Dunning,

1993). They can attract scarce domestic resources, for example, a talented and skilled workforce. This translates into additional competitive pressure within labour markets and has the potential to change the entrepreneurial landscape in the local economy. A crucial driver behind new firm formation is the supply of entrepreneurially-talented individuals. Equally important is the extent to which these prospective entrepreneurs have inclinations towards launching businesses of their own. This problem falls within the domain of occupational choice models in which individuals have preferences for one of the alternative occupations and associated income flows; for instance, the individual decides either to be an employee or become self-employed. This decision depends in part on the difference between expected income from wage-employment and entrepreneurial pay. Given that wage structures offered by foreign companies are typically attractive by domestic standards, especially for skilled or managerial labour, potential entrepreneurs may take positions in these firms in preference over engaging in entrepreneurial activities. Related to this explanation, Grossman (1984) argues that FDI inflows not only lower the number of domestic entrepreneurs, but also affect the distribution of individuals becoming entrepreneurs. Therefore, by attracting potential entrepreneurs into wage-employment, it is plausible to expect that FDI presence exerts a negative effect on domestic firm formation. Given data unavailability, in this study we can only propose rather than test for these alternative explanations.

The GEM measures that we employ approach entrepreneurship from a quantitative perspective. This is to say that the negative effects of FDI simply reflect lower levels of entrepreneurship, but this does not necessarily mean FDI also reduces entrepreneurial quality. The presence of FDI might aid the birth of high-growth businesses which in turn might create positive welfare effects in the host countries.

Our paper has policy implications as well. Many countries offer generous incentives to attract more FDI in the hope of knowledge spillovers. What our paper suggests is that while foreign firms may offer advantages for domestic firm development, policy circles should also consider the negative effects of FDI inflows on entrepreneurial activity. In practice, our analysis shows that the economic impact on domestic entrepreneurship, while negative, is quantitatively relatively small. Moreover, our findings refer only to FDI via M&A, which represents around 80% of worldwide inflows. Further work is needed to explore the impact of greenfield FDI. Even so, policy makers evaluating strategies to encourage foreign investors via M&A could consider acting simultaneously to offset the relatively modest negative impact on domestic entrepreneurship by providing support for such entrepreneurs.

## 2.7. Future Research Opportunities

Given its significant share in overall inflows, this study specifically focused on FDI effects via the M&A route. It would also be interesting to explore the role of greenfield FDI in entrepreneurship development as theory predicts that greenfield and M&A may have different effects on host countries. To begin with, the theoretical literature suggests that the most productive firms choose greenfield entry rather than via M&A (see, Haller, 2009; Mattoo et al., 2004).[47] If this is the case, the scope for positive effects is larger via the greenfield route. On the other hand, the most productive firms usually protect their technology to preserve a competitive advantage in the market, and thereby offering limited potential for positive effects. Productivity advantages can translate into increased

[47] Broadly speaking, the reason is that foreign firms can capture the entire return on investment via greenfield route while profits should be shared with the local partner in the case of M&A.

competition, more than the M&A-induced competition, which may result in the crowding-out of domestic entrepreneurship. Furthermore, FDI in M&A form already has operational customer-supplier linkages with local firms that greenfield investment has yet to create. In this case, foreign entry via M&A may offer greater scope for positive effects (Javorcik, 2004). However, upon acquisition, existing local supplier links may be weakened over time, and ultimately replaced by international sourcing. Labour turnover subsequent to ownership change via M&A entry may act as a more pronounced spillover channel compared to the greenfield route. Each of these differences presents opportunities for future research.

The ownership structure of foreign firms is also an interesting sphere for future research avenues. Foreign firms may prefer full or majority ownership to have greater control over their operations in host countries or retain minority stakes. Blomström and Sjöholm (1999) argue that multinationals are more likely to transfer pioneering technology and management techniques to wholly-owned affiliates than to partially-owned ones. As is standard in the literature, this study uses 10% ownership to distinguish foreign from domestic firms. Future research may also aim to identify possible effects of the alternative ownership structures on domestic entrepreneurship.

Next, much research effort has been directed towards the investigation of gender differences in entrepreneurial characteristics and performance. In their survey, Klapper and Parker (2011, p: 43) conclude that "women entrepreneurs tend to underperform relative to their male counterparts." It is an open research question whether the FDI-induced competition in local markets affects the performance of women-owned businesses similar to those owned by men.

Corporate entrepreneurship or intrapreneurship has received increasing attention in recent studies. It refers to the process of new business formation in existing firms to enhance the organizations' economic performance (Zahra, 1991). Other innovative activities such as the development of new products, services, technologies and administrative techniques also fall within the scope of corporate entrepreneurship. Intrapreneurship is important for firm survival, profitability, growth, and renewal because such activities enhance firms' knowledge base and help them seize opportunities in various markets (Sharma and Chrisman, 1999). It also expands firms' capacity to respond quickly to the competitive changes within their environment. When foreign firms enter a new country, they face greater challenges and uncertainties than domestic firms due to their unfamiliarity with local conditions, such as cultural and economic differences. Therefore, it would be interesting to explore whether corporate entrepreneurship in foreign firms helps them to adapt more readily to local conditions and consequently, boost their performance.

# 2.8. Appendices

## Appendix A: Results Tables for Robustness Analyses

**Table 2-A-1:** Robustness analysis I: Aggregate results using nascent entrepreneurship rate

| | OLS (1) | 2SLS (2) | 2SLS (3) | OLS (4) | 2SLS (5) | 2SLS (6) | OLS (7) | 2SLS (8) | 2SLS (9) | OLS (10) | 2SLS (11) | 2SLS (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Year Dummies are included | | | FDI/GDP with Two Year Lag | | | LogGDPpc is included | | | GDPpc * GDPpc is included | | |
| FDI/GDP | -0.327* | -2.133*** | -2.081*** | | | | -0.301* | -1.957*** | -1.687*** | -0.256 | -1.864*** | -1.554*** |
| | (0.185) | (0.630) | (0.496) | | | | (0.180) | (0.596) | (0.465) | (0.191) | (0.575) | (0.418) |
| $FDI/GDP_{t-2}$ | | | | -0.232 | -1.821*** | -2.045*** | | | | | | |
| | | | | (0.218) | (0.588) | (0.535) | | | | | | |
| GDPpc 2 | -3.120*** | -3.014*** | -3.017*** | -3.055*** | -3.298*** | -3.332*** | | | | | | |
| | (0.879) | (0.877) | (0.878) | (0.883) | (0.947) | (0.968) | | | | | | |
| GDPpc 3 | -3.730*** | -3.182*** | -3.198*** | -3.822*** | -3.332*** | -3.263*** | | | | | | |
| | (0.989) | (1.099) | (1.098) | (1.000) | (1.098) | (1.149) | | | | | | |
| GDPpc 4 | -4.093*** | -3.367*** | -3.388*** | -4.248*** | -4.014*** | -3.981*** | | | | | | |
| | (1.032) | (1.141) | (1.152) | (1.049) | (1.173) | (1.226) | | | | | | |
| GDPpc 5 | -3.649*** | -3.248*** | -3.260*** | -3.712*** | -3.700*** | -3.698*** | | | | | | |
| | (1.026) | (1.247) | (1.240) | (1.028) | (1.271) | (1.332) | | | | | | |
| LogGDPpc | | | | | | | -2.589*** | -2.379*** | -2.413*** | | | |
| | | | | | | | (0.426) | (0.519) | (0.485) | | | |
| GDPpc | | | | | | | | | | -0.000*** | -0.000*** | -0.000*** |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| GDPpc * GDPpc | | | | | | | | | | 0.000*** | 0.000* | 0.000** |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| Business Registration | 0.003 | -0.010 | -0.009 | 0.003 | -0.006 | -0.008 | 0.003 | -0.009 | -0.007 | 0.003 | -0.010 | -0.007 |
| | (0.020) | (0.013) | (0.013) | (0.023) | (0.018) | (0.017) | (0.018) | (0.011) | (0.012) | (0.019) | (0.012) | (0.013) |
| Survival Self-expression | 1.005*** | 1.611*** | 1.593*** | 1.077*** | 1.824*** | 1.929*** | 1.426*** | 2.028*** | 1.930*** | 1.630*** | 2.150*** | 2.050*** |
| | (0.326) | (0.535) | (0.530) | (0.321) | (0.508) | (0.540) | (0.322) | (0.489) | (0.474) | (0.360) | (0.525) | (0.500) |
| Traditional Rational | -1.691*** | -1.814*** | -1.810*** | -1.601*** | -1.654*** | -1.661*** | -1.665*** | -1.766*** | -1.750*** | -1.401*** | -1.615*** | -1.573*** |
| | (0.308) | (0.403) | (0.394) | (0.316) | (0.358) | (0.376) | (0.302) | (0.344) | (0.322) | (0.292) | (0.334) | (0.306) |
| Constant | 7.303*** | 6.743*** | 6.760*** | 6.930*** | 8.047*** | 8.130*** | 29.728*** | 27.648*** | 28.034*** | 10.205*** | 9.160*** | 9.404*** |
| | (1.319) | (0.950) | (0.974) | (1.049) | (1.159) | (1.164) | (4.443) | (5.006) | (4.702) | (1.443) | (1.194) | (1.166) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 347 | 347 | 347 | 323 | 323 | 323 | 347 | 347 | 347 | 347 | 347 | 347 |
| Countries | 70 | 70 | 70 | 66 | 66 | 66 | 70 | 70 | 70 | 70 | 70 | 70 |
| Partial $R^2$ (first stage) | | 0.1590 | 0.2242 | | 0.1265 | 0.1644 | | 0.1579 | 0.2140 | | 0.1581 | 0.2353 |
| F-stat (first stage) | | 28.85 | 25.44 | | 21.15 | 19.37 | | 27.04 | 18.01 | | 28.58 | 23.18 |
| Endogeneity | | 0.0006 | 0.0000 | | 0.0002 | 0.0000 | | 0.0017 | 0.0004 | | 0.0016 | 0.0003 |
| Over-identification | | | 0.8840 | | | 0.5111 | | | 0.3614 | | | 0.3431 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Under-identification | | 0.0001 | 0.0000 | | 0.0004 | 0.0003 | | 0.0002 | 0.0001 | | 0.0006 | 0.0002 |
| Weak-identification | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0001 | 0.0001 | | 0.0001 | 0.0002 |
| $R^2$ | 0.462 | | | 0.441 | | | 0.500 | | | 0.501 | | |
| F-stat | 8.963 | 5.409 | 6.074 | 6.421 | 4.141 | 4.482 | 10.863 | 5.940 | 6.872 | | 5.462 | 6.566 |

*Notes:* Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-2:** Robustness analysis II: Aggregate results using nascent entrepreneurship rate

| | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| | GDPpc Developing is included | | | OECD subsample | | | Non-OECD subsample | | | Developed countries (WB) | | | Developing countries (WB) | | |
| FDI/GDP | -0.318* | -2.229*** | -2.209*** | -0.284* | -1.801*** | -1.404*** | -0.383 | -2.031*** | -2.013*** | -0.079 | -0.858* | -0.564* | -0.718* | -2.815*** | -2.816*** |
| | (0.180) | (0.682) | (0.578) | (0.157) | (0.638) | (0.503) | (0.305) | (0.784) | (0.719) | (0.126) | (0.493) | (0.323) | (0.363) | (1.008) | (0.850) |
| GDPpc Developing | 3.080*** | 2.691*** | 2.695*** | | | | | | | | | | | | |
| | (0.735) | (0.851) | (0.846) | | | | | | | | | | | | |
| LogGDPpc | | | | -2.088 | -3.533** | -3.154** | -2.308*** | -1.993*** | -1.997*** | -1.093 | -1.385 | -1.275 | -2.523*** | -1.409 | -1.408* |
| | | | | (1.474) | (1.421) | (1.343) | (0.541) | (0.707) | (0.682) | (0.894) | (1.111) | (0.969) | (0.807) | (0.882) | (0.765) |
| Business Registra. | 0.006 | -0.008 | -0.008 | -0.019* | -0.022** | -0.021** | 0.007 | -0.004 | -0.004 | -0.022** | -0.028** | -0.026*** | 0.003 | -0.016 | -0.016 |
| | (0.019) | (0.012) | (0.012) | (0.009) | (0.011) | (0.010) | (0.029) | (0.019) | (0.019) | (0.009) | (0.011) | (0.010) | (0.030) | (0.019) | (0.018) |
| Survival Self-expres | 0.878*** | 1.607*** | 1.599*** | 1.052* | 2.363*** | 2.019*** | 1.606** | 1.653** | 1.653** | 0.647* | 1.035* | 0.889** | 1.970** | 1.197 | 1.197 |
| | (0.295) | (0.480) | (0.485) | (0.544) | (0.874) | (0.753) | (0.627) | (0.723) | (0.722) | (0.340) | (0.534) | (0.417) | (0.865) | (0.975) | (0.921) |
| Traditional Rational | -1.643*** | -1.786*** | -1.785*** | -1.457*** | -1.580*** | -1.548*** | -1.710** | -1.845** | -1.844** | -1.158*** | -1.143*** | -1.149*** | -1.879* | -3.241** | -3.241*** |
| | (0.308) | (0.434) | (0.429) | (0.344) | (0.299) | (0.288) | (0.714) | (0.819) | (0.817) | (0.306) | (0.338) | (0.308) | (0.946) | (1.295) | (1.157) |
| Constant | 3.465*** | 3.448*** | 3.451*** | 25.607* | 40.565*** | 36.647*** | 25.808*** | 22.854*** | 22.898*** | 15.580* | 18.226 | 17.052* | 30.929*** | 16.117* | 16.113** |
| | (0.983) | (0.730) | (0.734) | (14.912) | (14.493) | (13.644) | (6.771) | (7.004) | (6.701) | (9.163) | (11.504) | (10.019) | (9.673) | (9.142) | (7.816) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 347 | 347 | 347 | 220 | 220 | 220 | 127 | 127 | 127 | 230 | 230 | 230 | 117 | 117 | 117 |
| Countries | 70 | 70 | 70 | 31 | 31 | 31 | 39 | 39 | 39 | 33 | 33 | 33 | 37 | 37 | 37 |
| Partial $R^2$ (1st stage) | | 0.1569 | 0.2002 | | 0.1434 | 0.1751 | | 0.2346 | 0.2797 | | 0.1581 | 0.2450 | | 0.2267 | 0.3040 |
| F-stat (1st stage) | | 27.87 | 18.36 | | 18.89 | 11.07 | | 30.07 | 17.82 | | 15.35 | 11.54 | | 20.51 | 14.96 |
| Endogeneity | | 0.0008 | 0.0001 | | 0.0043 | 0.0117 | | 0.0256 | 0.0094 | | 0.0627 | 0.0381 | | 0.0211 | 0.0048 |
| Over-identification | | | 0.9466 | | | 0.1417 | | | 0.9518 | | | 0.4029 | | | 0.9987 |
| Under-identification | | 0.0001 | 0.0001 | | 0.0023 | 0.0061 | | 0.0003 | 0.0011 | | 0.0014 | 0.0030 | | 0.0010 | 0.0041 |
| Weak-identification | | 0.0000 | 0.0000 | | 0.0003 | 0.0009 | | 0.0033 | 0.0057 | | 0.0292 | 0.0599 | | 0.0052 | 0.0018 |
| $R^2$ | 0.451 | | | 0.420 | | | 0.425 | | | 0.338 | | | 0.379 | | |
| F-stat | 9.707 | 5.242 | 5.671 | 3.001 | 5.311 | 4.263 | 13.580 | 5.279 | 5.016 | 2.962 | 3.120 | 3.183 | 9.602 | 15.122 | 15.404 |

*Notes:* The variable GDPpc Developing in columns (1) - (3) is a dummy that is equal to 1 if a country is a developing nation according to the World Bank classification, 0 otherwise. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-3:** Robustness analysis III: Aggregate results using high-growth entrepreneurship rate

| | OLS (1) | 2SLS (2) | 2SLS (3) | OLS (4) | 2SLS (5) | 2SLS (6) | OLS (7) | 2SLS (8) | 2SLS (9) | OLS (10) | 2SLS (11) | 2SLS (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Year Dummies are included | | | FDI/GDP with Two Year Lag | | | LogGDPpc is included | | | GDPpc * GDPpc is included | | |
| FDI/GDP | -0.178* | -1.087*** | -0.745*** | | | | -0.180** | -1.153*** | -0.820*** | -0.153 | -1.095*** | -0.688*** |
| | (0.092) | (0.303) | (0.219) | | | | (0.090) | (0.328) | (0.244) | (0.094) | (0.316) | (0.227) |
| $FDI/GDP_{t-2}$ | | | | -0.090 | -0.995*** | -0.756*** | | | | | | |
| | | | | (0.102) | (0.331) | (0.269) | | | | | | |
| GDPpc 2 | -0.889 | -0.861* | -0.872* | -0.872 | -1.002* | -0.968* | | | | | | |
| | (0.547) | (0.512) | (0.508) | (0.563) | (0.536) | (0.523) | | | | | | |
| GDPpc 3 | -1.087 | -0.828 | -0.925 | -1.090 | -0.817 | -0.889 | | | | | | |
| | (0.669) | (0.667) | (0.644) | (0.682) | (0.641) | (0.637) | | | | | | |
| GDPpc 4 | -1.222* | -0.876 | -1.006 | -1.235* | -1.091 | -1.129 | | | | | | |
| | (0.727) | (0.715) | (0.697) | (0.740) | (0.701) | (0.692) | | | | | | |
| GDPpc 5 | -0.663 | -0.477 | -0.547 | -0.615 | -0.595 | -0.600 | | | | | | |
| | (0.738) | (0.743) | (0.714) | (0.757) | (0.732) | (0.714) | | | | | | |
| LogGDPpc | | | | | | | -0.278 | -0.162 | -0.201 | | | |
| | | | | | | | (0.365) | (0.358) | (0.345) | | | |
| GDPpc | | | | | | | | | | -0.000* | -0.000 | -0.000 |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| GDPpc * GDPpc | | | | | | | | | | 0.000** | 0.000 | 0.000 |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| Business Registration | -0.005 | -0.012** | -0.009 | -0.004 | -0.009 | -0.008 | -0.003 | -0.011** | -0.008* | -0.003 | -0.011** | -0.008 |
| | (0.008) | (0.006) | (0.006) | (0.009) | (0.006) | (0.006) | (0.007) | (0.005) | (0.005) | (0.008) | (0.005) | (0.005) |
| Survival Self-expression | 0.286 | 0.568* | 0.462* | 0.259 | 0.660** | 0.554** | 0.270 | 0.601** | 0.488* | 0.385* | 0.664** | 0.543** |
| | (0.239) | (0.295) | (0.271) | (0.235) | (0.283) | (0.271) | (0.215) | (0.259) | (0.252) | (0.225) | (0.286) | (0.262) |
| Traditional Rational | -0.775*** | -0.831*** | -0.810*** | -0.758*** | -0.782*** | -0.775*** | -0.909*** | -0.965*** | -0.946*** | -0.764*** | -0.891*** | -0.836*** |
| | (0.234) | (0.250) | (0.230) | (0.244) | (0.243) | (0.232) | (0.253) | (0.264) | (0.249) | (0.242) | (0.274) | (0.249) |
| Constant | 3.028*** | 2.955*** | 3.037*** | 3.269*** | 3.536*** | 3.446*** | 4.999 | 3.922 | 4.352 | 3.562*** | 3.028*** | 3.323*** |
| | (0.668) | (0.634) | (0.620) | (0.676) | (0.698) | (0.649) | (3.670) | (3.533) | (3.415) | (0.926) | (0.937) | (0.898) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 330 | 330 | 330 | 326 | 326 | 326 | 330 | 330 | 330 | 330 | 330 | 330 |
| Countries | 69 | 69 | 69 | 66 | 66 | 66 | 69 | 69 | 69 | 69 | 69 | 69 |
| Partial $R^2$ (first stage) | | 0.1654 | 0.2290 | | 0.1278 | 0.1652 | | 0.1629 | 0.2163 | | 0.1632 | 0.2376 |
| F-stat (first stage) | | 31.45 | 27.75 | | 21.07 | 18.71 | | 28.88 | 19.38 | | 30.52 | 24.43 |
| Endogeneity | | 0.0002 | 0.0032 | | 0.0005 | 0.0031 | | 0.0003 | 0.0050 | | 0.0003 | 0.0107 |
| Over-identification | | | 0.1440 | | | 0.3152 | | | 0.1192 | | | 0.0947 |
| Under-identification | | 0.0001 | 0.0000 | | 0.0004 | 0.0003 | | 0.0001 | 0.0001 | | 0.0008 | 0.0004 |
| Weak-identification | | 0.0000 | 0.0000 | | 0.0001 | 0.0004 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 |
| $R^2$ | 0.299 | | | 0.273 | | | 0.276 | | | 0.295 | | |
| F-stat | 3.891 | 3.692 | 4.726 | 2.796 | 3.030 | 3.410 | 3.482 | 2.889 | 3.562 | | 3.521 | 5.271 |

*Notes:* Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-4:** Robustness analysis IV: Aggregate results using high-growth entrepreneurship rate

| | OLS (1) | 2SLS (2) | 2SLS (3) | OLS (4) | 2SLS (5) | 2SLS (6) | OLS (7) | 2SLS (8) | 2SLS (9) | OLS (10) | 2SLS (11) | 2SLS (12) | OLS (13) | 2SLS (14) | 2SLS (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GDPpc Developing is included | | | OECD subsample | | | Non-OECD subsample | | | Developed countries (WB) | | | Developing countries (WB) | | |
| FDI/GDP | -0.178* | -1.125*** | -0.831*** | -0.150 | -1.440*** | -0.722** | -0.220 | -0.623 | -0.666* | -0.132* | -0.904** | -0.465** | -0.197 | -0.941** | -0.751** |
| | (0.090) | (0.317) | (0.243) | (0.094) | (0.501) | (0.333) | (0.148) | (0.435) | (0.374) | (0.069) | (0.378) | (0.213) | (0.174) | (0.436) | (0.356) |
| GDPpc Developing | 0.617 | 0.442 | 0.497 | | | | | | | | | | | | |
| | (0.491) | (0.449) | (0.440) | | | | | | | | | | | | |
| LogGDPpc | | | | -0.929 | -2.049 | -1.426 | 0.077 | 0.150 | 0.158 | 0.675 | 0.394 | 0.554 | -0.157 | 0.228 | 0.130 |
| | | | | (0.977) | (1.437) | (1.118) | (0.403) | (0.357) | (0.353) | (0.526) | (0.654) | (0.536) | (0.640) | (0.714) | (0.617) |
| Business Registra. | -0.004 | -0.011** | -0.009* | -0.015** | -0.019** | -0.017** | -0.001 | -0.004 | -0.004 | -0.014*** | -0.020*** | -0.017*** | -0.003 | -0.010 | -0.008 |
| | (0.007) | (0.005) | (0.005) | (0.006) | (0.009) | (0.007) | (0.011) | (0.008) | (0.008) | (0.005) | (0.007) | (0.005) | (0.011) | (0.008) | (0.008) |
| Survival Self-expres. | 0.256 | 0.596*** | 0.491** | 0.374 | 1.447** | 0.850* | 0.831 | 0.811 | 0.809 | -0.061 | 0.315 | 0.101 | 1.240** | 0.900 | 0.987* |
| | (0.180) | (0.231) | (0.230) | (0.318) | (0.622) | (0.447) | (0.560) | (0.528) | (0.526) | (0.224) | (0.389) | (0.275) | (0.602) | (0.670) | (0.598) |
| Traditional Rational | -0.836*** | -0.902*** | -0.881*** | -0.700*** | -0.809*** | -0.749*** | -0.673 | -0.712 | -0.716 | -0.701*** | -0.674*** | -0.689*** | -0.398 | -0.895 | -0.767 |
| | (0.244) | (0.261) | (0.245) | (0.140) | (0.221) | (0.143) | (0.489) | (0.444) | (0.444) | (0.140) | (0.228) | (0.155) | (0.626) | (0.720) | (0.648) |
| Constant | 2.110*** | 2.213*** | 2.232*** | 11.714 | 23.351 | 16.877 | 2.451 | 1.365 | 1.261 | -4.411 | -1.398 | -3.112 | 3.435 | 0.386 | 1.509 |
| | (0.315) | (0.398) | (0.366) | (10.056) | (14.804) | (11.514) | (3.996) | (3.794) | (3.715) | (5.188) | (6.603) | (5.347) | (6.170) | (7.239) | (6.203) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 330 | 330 | 330 | 206 | 206 | 206 | 124 | 124 | 124 | 214 | 214 | 214 | 116 | 116 | 116 |
| Countries | 69 | 69 | 69 | 31 | 31 | 31 | 38 | 38 | 38 | 33 | 33 | 33 | 36 | 36 | 36 |
| Partial $R^2$ (1st stage) | | 0.1622 | 0.2032 | | 0.1383 | 0.1725 | | 0.2339 | 0.2783 | | 0.1600 | 0.2388 | | 0.2302 | 0.3055 |
| F-stat (1st stage) | | 29.43 | 18.92 | | 18.11 | 10.80 | | 30.99 | 18.38 | | 15.70 | 11.23 | | 21.52 | 15.28 |
| Endogeneity | | 0.0003 | 0.0045 | | 0.0002 | 0.0344 | | 0.3091 | 0.1848 | | 0.0009 | 0.0528 | | 0.1039 | 0.1272 |
| Over-identification | | | 0.1230 | | | 0.0313 | | | 0.7469 | | | 0.0598 | | | 0.5827 |
| Under-identification | | 0.0001 | 0.0000 | | 0.0025 | 0.0067 | | 0.0003 | 0.0011 | | 0.0011 | 0.0026 | | 0.0009 | 0.0039 |
| Weak-identification | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.1193 | 0.0833 | | 0.0001 | 0.0001 | | 0.0259 | 0.0648 |
| $R^2$ | 0.282 | | | 0.317 | | | 0.236 | | | 0.295 | | | 0.213 | | |
| F-stat | 3.663 | 2.836 | 3.475 | 4.069 | 6.377 | 10.607 | 9.438 | 5.139 | 5.096 | 6.107 | 11.433 | 16.604 | 6.850 | 5.301 | 6.316 |

*Notes:* The variable GDPpc Developing in columns (1) - (3) is a dummy that is equal to 1 if a country is a developing nation according to the World Bank classification, 0 otherwise. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-5:** Robustness analysis V: Aggregate results using TEA

| | OLS (1) | 2SLS (2) | 2SLS (3) | OLS (4) | 2SLS (5) | 2SLS (6) | OLS (7) | 2SLS (8) | 2SLS (9) | OLS (10) | 2SLS (11) | 2SLS (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Year Dummies are included | | | FDI/GDP with Two Year Lag | | | LogGDPpc is included | | | GDPpc * GDPpc is included | | |
| FDI/GDP | -0.322 | -2.845*** | -2.770*** | | | | -0.271 | -2.518*** | -2.019*** | -0.173 | -2.363*** | -1.859*** |
| | (0.238) | (0.946) | (0.743) | | | | (0.233) | (0.857) | (0.670) | (0.250) | (0.839) | (0.592) |
| $FDI/GDP_{t-2}$ | | | | -0.319 | -2.679*** | -2.937*** | | | | | | |
| | | | | (0.284) | (0.976) | (0.849) | | | | | | |
| GDPpc 2 | -6.026*** | -5.878*** | -5.882*** | -6.123*** | -6.484*** | -6.523*** | | | | | | |
| | (1.635) | (1.532) | (1.536) | (1.648) | (1.636) | (1.638) | | | | | | |
| GDPpc 3 | -7.329*** | -6.562*** | -6.585*** | -7.543*** | -6.816*** | -6.736*** | | | | | | |
| | (1.845) | (1.848) | (1.862) | (1.893) | (1.929) | (1.996) | | | | | | |
| GDPpc 4 | -7.803*** | -6.790*** | -6.820*** | -8.097*** | -7.750*** | -7.712*** | | | | | | |
| | (1.923) | (1.963) | (1.992) | (1.957) | (2.048) | (2.108) | | | | | | |
| GDPpc 5 | -7.012*** | -6.451*** | -6.468*** | -7.215*** | -7.196*** | -7.194*** | | | | | | |
| | (1.774) | (1.939) | (1.943) | (1.810) | (2.056) | (2.116) | | | | | | |
| LogGDPpc | | | | | | | -5.006*** | -4.722*** | -4.785*** | | | |
| | | | | | | | (0.890) | (0.944) | (0.915) | | | |
| GDPpc | | | | | | | | | | -0.001*** | -0.001*** | -0.001*** |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| GDPpc * GDPpc | | | | | | | | | | 0.000*** | 0.000** | 0.000*** |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| Business Registration | 0.005 | -0.013 | -0.012 | 0.006 | -0.008 | -0.009 | 0.006 | -0.011 | -0.007 | 0.005 | -0.011 | -0.007 |
| | (0.021) | (0.015) | (0.014) | (0.023) | (0.018) | (0.017) | (0.016) | (0.011) | (0.011) | (0.018) | (0.012) | (0.012) |
| Survival Self-expression | 1.486** | 2.333*** | 2.308*** | 1.668*** | 2.777*** | 2.898*** | 2.315*** | 3.132*** | 2.950*** | 2.653*** | 3.361*** | 3.198*** |
| | (0.577) | (0.810) | (0.793) | (0.578) | (0.857) | (0.866) | (0.600) | (0.732) | (0.704) | (0.634) | (0.790) | (0.754) |
| Traditional Rational | -2.293*** | -2.464*** | -2.459*** | -2.229*** | -2.307*** | -2.316*** | -2.247*** | -2.385*** | -2.354*** | -1.731*** | -2.022*** | -1.956*** |
| | (0.523) | (0.635) | (0.622) | (0.529) | (0.582) | (0.599) | (0.490) | (0.510) | (0.483) | (0.463) | (0.520) | (0.479) |
| Constant | 12.068*** | 13.030*** | 13.054*** | 12.741*** | 14.888*** | 14.983*** | 56.260*** | 54.533*** | 55.246*** | 18.480*** | 18.126*** | 18.523*** |
| | (2.097) | (1.693) | (1.723) | (2.083) | (1.812) | (1.774) | (9.060) | (9.243) | (8.995) | (2.401) | (2.271) | (2.231) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 347 | 347 | 347 | 323 | 323 | 323 | 347 | 347 | 347 | 347 | 347 | 347 |
| Countries | 70 | 70 | 70 | 66 | 66 | 66 | 70 | 70 | 70 | 70 | 70 | 70 |
| Partial $R^2$ (first stage) | | 0.1590 | 0.2242 | | 0.1265 | 0.1644 | | 0.1579 | 0.2140 | | 0.1581 | 0.2353 |
| F-stat (first stage) | | 28.85 | 25.44 | | 21.15 | 19.37 | | 27.04 | 18.01 | | 28.58 | 23.18 |
| Endogeneity | | 0.0013 | 0.0000 | | 0.0029 | 0.0001 | | 0.0038 | 0.0025 | | 0.0035 | 0.0012 |
| Over-identification | | | 0.8916 | | | 0.6460 | | | 0.2613 | | | 0.3143 |
| Under-identification | | 0.0001 | 0.0000 | | 0.0004 | 0.0003 | | 0.0002 | 0.0001 | | 0.0006 | 0.0002 |
| Weak-identification | | 0.0001 | 0.0000 | | 0.0004 | 0.0001 | | 0.0003 | 0.0009 | | 0.0048 | 0.0016 |
| $R^2$ | 0.523 | | | 0.523 | | | 0.583 | | | 0.581 | | |
| F-stat | 8.274 | 5.897 | 7.133 | 7.179 | 5.148 | 5.994 | 9.997 | 7.344 | 8.774 | | 7.015 | 8.586 |

*Notes:* Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-6:** Robustness analysis VI: Aggregate results using TEA

| | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| | GDPpc Developing is included | | | OECD subsample | | | Non-OECD subsample | | | Developed countries (WB) | | | Developing countries (WB) | | |
| FDI/GDP | -0.306 | -3.097*** | -3.106*** | -0.245 | -2.916*** | -2.043*** | -0.231 | -1.922* | -1.836** | -0.038 | -1.555* | -0.856 | -0.427 | -2.743** | -3.051*** |
| | (0.232) | (1.051) | (0.881) | (0.196) | (1.069) | (0.776) | (0.372) | (1.093) | (0.931) | (0.187) | (0.863) | (0.555) | (0.365) | (1.333) | (1.087) |
| GDPpc Developing | 5.701*** | 5.133*** | 5.131*** | | | | | | | | | | | | |
| | (1.397) | (1.468) | (1.468) | | | | | | | | | | | | |
| LogGDPpc | | | | -3.285 | -5.827** | -4.996** | -4.711*** | -4.388*** | -4.404*** | -1.539 | -2.108 | -1.846 | -6.561*** | -5.330** | -5.166** |
| | | | | (2.127) | (2.383) | (2.106) | (1.092) | (1.131) | (1.114) | (1.533) | (1.893) | (1.616) | (1.976) | (2.148) | (2.060) |
| Business Registra. | 0.012 | -0.008 | -0.008 | -0.039* | -0.045* | -0.043* | 0.015 | 0.004 | 0.004 | -0.038* | -0.048** | -0.044** | 0.018 | -0.003 | -0.006 |
| | (0.019) | (0.013) | (0.013) | (0.020) | (0.024) | (0.022) | (0.026) | (0.018) | (0.018) | (0.019) | (0.023) | (0.021) | (0.028) | (0.019) | (0.016) |
| Survival Self-expres. | 1.212** | 2.276*** | 2.279*** | 1.194 | 3.501** | 2.746** | 2.759** | 2.808** | 2.805** | 0.793 | 1.549* | 1.201* | 4.393*** | 3.540** | 3.427** |
| | (0.530) | (0.754) | (0.752) | (1.059) | (1.456) | (1.200) | (1.279) | (1.193) | (1.189) | (0.636) | (0.929) | (0.692) | (1.606) | (1.649) | (1.637) |
| Traditional Rational | -2.265*** | -2.473*** | -2.474*** | -1.995*** | -2.211*** | -2.140*** | -2.263* | -2.402** | -2.395** | -1.674*** | -1.643*** | -1.657*** | -1.404 | -2.907 | -3.107* |
| | (0.531) | (0.695) | (0.693) | (0.415) | (0.463) | (0.395) | (1.212) | (1.178) | (1.172) | (0.431) | (0.560) | (0.464) | (1.454) | (1.865) | (1.741) |
| Constant | 5.534*** | 6.555*** | 6.554*** | 41.280* | 67.608*** | 59.002*** | 49.793*** | 50.535*** | 50.753*** | 23.660 | 28.959 | 26.165 | 68.479*** | 58.494*** | 56.619*** |
| | (1.216) | (1.104) | (1.112) | (21.413) | (24.228) | (21.368) | (11.416) | (11.181) | (11.002) | (15.836) | (19.733) | (16.854) | (19.016) | (21.306) | (20.315) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 347 | 347 | 347 | 220 | 220 | 220 | 127 | 127 | 127 | 230 | 230 | 230 | 117 | 117 | 117 |
| Countries | 70 | 70 | 70 | 31 | 31 | 31 | 39 | 39 | 39 | 33 | 33 | 33 | 37 | 37 | 37 |
| Partial $R^2$ (1st stage) | | 0.1569 | 0.2002 | | 0.1434 | 0.1751 | | 0.2346 | 0.2797 | | 0.1581 | 0.2450 | | 0.2267 | 0.3040 |
| F-stat (1st stage) | | 27.87 | 18.36 | | 18.89 | 11.07 | | 30.07 | 17.82 | | 15.35 | 11.54 | | 20.51 | 14.96 |
| Endogeneity | | 0.0012 | 0.0001 | | 0.0018 | 0.0078 | | 0.1329 | 0.0726 | | 0.0246 | 0.0460 | | 0.0856 | 0.0100 |
| Over-identification | | | 0.9835 | | | 0.0399 | | | 0.8538 | | | 0.2317 | | | 0.6676 |
| Under-identification | | 0.0001 | 0.0001 | | 0.0023 | 0.0061 | | 0.0003 | 0.0011 | | 0.0014 | 0.0030 | | 0.0010 | 0.0041 |
| Weak-identification | | 0.0002 | 0.0000 | | 0.0001 | 0.0001 | | 0.0544 | 0.0855 | | 0.0156 | 0.0432 | | 0.0281 | 0.0074 |
| $R^2$ | 0.498 | | | 0.404 | | | 0.538 | | | 0.296 | | | 0.484 | | |
| F-stat | 9.360 | 5.763 | 6.181 | 6.279 | 9.881 | 9.432 | 5.926 | 5.646 | 5.575 | 6.133 | 4.010 | 6.090 | 7.200 | 72.161 | 75.727 |

*Notes:* The variable GDPpc Developing in columns (1) - (3) is a dummy that is equal to 1 if a country is a developing nation according to the World Bank classification, 0 otherwise. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-7:** Robustness analysis VII: Results for transformative industries using TEA

| | OLS (1) | 2SLS (2) | 2SLS (3) | OLS (4) | 2SLS (5) | 2SLS (6) | OLS (7) | 2SLS (8) | 2SLS (9) | OLS (10) | 2SLS (11) | 2SLS (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Year Dummies are included | | | FDI/GDP with Two Year Lag | | | LogGDPpc is included | | | GDPpc * GDPpc is included | | |
| $FDI/GDP_{\_Horizontal}$ | -0.031 | -0.642** | -0.651*** | | | | -0.049 | -0.694** | -0.634** | -0.021 | -0.634** | -0.500** |
| | (0.063) | (0.324) | (0.251) | | | | (0.063) | (0.302) | (0.251) | (0.068) | (0.306) | (0.208) |
| $(FDI/GDP_{\_Horizontal})_{t-2}$ | | | | -0.101** | -0.481* | -0.503** | | | | | | |
| | | | | (0.050) | (0.276) | (0.225) | | | | | | |
| GDPpc 2 | -1.281*** | -1.185** | -1.184** | -1.295*** | -1.207*** | -1.202*** | | | | | | |
| | (0.474) | (0.468) | (0.479) | (0.450) | (0.433) | (0.446) | | | | | | |
| GDPpc 3 | -1.816*** | -1.485*** | -1.480** | -1.842*** | -1.465*** | -1.444** | | | | | | |
| | (0.496) | (0.570) | (0.582) | (0.482) | (0.560) | (0.576) | | | | | | |
| GDPpc 4 | -1.982*** | -1.738*** | -1.734*** | -2.049*** | -1.893*** | -1.884*** | | | | | | |
| | (0.523) | (0.573) | (0.590) | (0.502) | (0.512) | (0.534) | | | | | | |
| GDPpc 5 | -1.855*** | -1.852*** | -1.852*** | -1.930*** | -1.852*** | -1.848*** | | | | | | |
| | (0.495) | (0.591) | (0.594) | (0.481) | (0.514) | (0.529) | | | | | | |
| LogGDPpc | | | | | | | -1.067*** | -1.075*** | -1.074*** | | | |
| | | | | | | | (0.311) | (0.347) | (0.337) | | | |
| GDPpc | | | | | | | | | | -0.000*** | -0.000* | -0.000** |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| GDPpc * GDPpc | | | | | | | | | | 0.000*** | 0.000 | 0.000 |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| Business Registration | 0.003 | -0.001 | -0.001 | 0.002 | 0.000 | 0.000 | 0.005 | 0.000 | 0.001 | 0.004 | -0.000 | 0.000 |
| | (0.005) | (0.005) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Survival Self-expression | 0.342** | 0.643*** | 0.647*** | 0.388*** | 0.611*** | 0.623*** | 0.425*** | 0.776*** | 0.743*** | 0.553*** | 0.825*** | 0.765*** |
| | (0.147) | (0.229) | (0.226) | (0.141) | (0.221) | (0.210) | (0.150) | (0.230) | (0.224) | (0.153) | (0.226) | (0.208) |
| Traditional Rational | -0.489*** | -0.540*** | -0.540*** | -0.494*** | -0.522*** | -0.524*** | -0.517*** | -0.514*** | -0.515*** | -0.405*** | -0.507*** | -0.485*** |
| | (0.151) | (0.189) | (0.187) | (0.158) | (0.175) | (0.174) | (0.137) | (0.183) | (0.174) | (0.145) | (0.177) | (0.158) |
| Constant | 2.531*** | 1.568** | 1.554** | 3.222*** | 3.437*** | 3.449*** | 11.674*** | 10.842*** | 10.919*** | 3.699*** | 2.324** | 2.624*** |
| | (0.388) | (0.775) | (0.677) | (0.497) | (0.536) | (0.486) | (2.802) | (3.266) | (3.176) | (0.552) | (0.955) | (0.743) |
| Year Effects | Yes | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 286 | 286 | 286 | 263 | 263 | 263 | 286 | 286 | 286 | 286 | 286 | 286 |
| Countries | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 |
| Partial $R^2$ (first stage) | | 0.1107 | 0.1557 | | 0.0978 | 0.1672 | | 0.1182 | 0.1611 | | 0.1044 | 0.1646 |
| F-stat (first stage) | | 11.25 | 9.64 | | 10.50 | 11.03 | | 13.37 | 8.74 | | 13.60 | 10.39 |
| Endogeneity | | 0.0089 | 0.0011 | | 0.1219 | 0.0413 | | 0.0044 | 0.0029 | | 0.0115 | 0.0096 |
| Over-identification | | | 0.9580 | | | 0.9136 | | | 0.6868 | | | 0.4598 |
| Under-identification | | 0.0037 | 0.0027 | | 0.0048 | 0.0024 | | 0.0024 | 0.0031 | | 0.0067 | 0.0047 |
| Weak-identification | | 0.0042 | 0.0013 | | 0.0354 | 0.0248 | | 0.0012 | 0.0023 | | 0.0071 | 0.0132 |
| $R^2$ | 0.445 | | | 0.421 | | | 0.457 | | | 0.483 | | |
| F-stat | 6.876 | 4.051 | 4.724 | 7.348 | 5.066 | 5.579 | 5.814 | 3.944 | 4.880 | | 2.934 | 4.403 |

*Notes:* Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-8:** Robustness analysis VIII: Results for transformative industries using TEA

| | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS | OLS | 2SLS | 2SLS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| | GDPpc Developing is included | | | OECD subsample | | | Non-OECD subsample | | | Developed countries (WB) | | | Developing countries (WB) | | |
| FDI/GDP_Horizontal | -0.035 | -0.704** | -0.752*** | -0.102* | -0.618** | -0.448* | 0.032 | -0.470 | -0.588** | -0.094 | -0.584** | -0.323** | 0.086 | -0.535 | -0.700 |
| | (0.063) | (0.330) | (0.283) | (0.057) | (0.286) | (0.233) | (0.113) | (0.313) | (0.284) | (0.061) | (0.248) | (0.157) | (0.160) | (0.505) | (0.486) |
| GDPpc Developing | 1.436*** | 1.336*** | 1.329*** | | | | | | | | | | | | |
| | (0.389) | (0.433) | (0.444) | | | | | | | | | | | | |
| LogGDPpc | | | | -1.199** | -1.661*** | -1.508*** | -0.779** | -0.751** | -0.745** | -1.179*** | -1.721*** | -1.432*** | -0.761 | -0.644 | -0.613 |
| | | | | (0.448) | (0.516) | (0.488) | (0.331) | (0.333) | (0.365) | (0.422) | (0.570) | (0.459) | (0.574) | (0.527) | (0.530) |
| Business Registra | 0.006 | 0.002 | 0.002 | -0.011* | -0.012* | -0.011* | 0.012* | 0.009** | 0.008** | -0.011** | -0.015** | -0.013** | 0.013 | 0.009* | 0.008 |
| | (0.004) | (0.004) | (0.004) | (0.006) | (0.007) | (0.006) | (0.007) | (0.004) | (0.004) | (0.005) | (0.007) | (0.006) | (0.008) | (0.005) | (0.005) |
| Survival Self-expres. | 0.252* | 0.596*** | 0.621*** | 0.324 | 0.781** | 0.630** | 0.834* | 1.043** | 1.092** | 0.297* | 0.618** | 0.447** | 1.137** | 0.924 | 0.867 |
| | (0.145) | (0.229) | (0.234) | (0.281) | (0.335) | (0.302) | (0.423) | (0.455) | (0.510) | (0.174) | (0.278) | (0.197) | (0.545) | (0.688) | (0.693) |
| Traditional Rational | -0.429*** | -0.450** | -0.451** | -0.467*** | -0.458*** | -0.461*** | -0.171 | -0.130 | -0.120 | -0.473*** | -0.458** | -0.466*** | 0.159 | -0.305 | -0.429 |
| | (0.148) | (0.210) | (0.218) | (0.098) | (0.158) | (0.131) | (0.410) | (0.416) | (0.449) | (0.118) | (0.204) | (0.146) | (0.548) | (0.812) | (0.790) |
| Constant | 1.040** | 0.154 | 0.090 | 13.813*** | 19.164*** | 17.446*** | 8.116** | 9.188*** | 8.965** | 13.588*** | 19.875*** | 16.628*** | 7.733 | 7.773 | 6.951 |
| | (0.501) | (0.801) | (0.752) | (4.420) | (5.423) | (5.114) | (3.472) | (3.270) | (3.640) | (4.423) | (6.006) | (4.861) | (5.483) | (5.905) | (5.785) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 286 | 286 | 286 | 189 | 189 | 189 | 97 | 97 | 97 | 196 | 196 | 196 | 90 | 90 | 90 |
| Countries | 59 | 59 | 59 | 30 | 30 | 30 | 29 | 29 | 29 | 31 | 31 | 31 | 28 | 28 | 28 |
| Partial $R^2$ (1st stage) | | 0.1143 | 0.1433 | | 0.1472 | 0.1719 | | 0.1579 | 0.1983 | | 0.1327 | 0.2256 | | 0.1412 | 0.1750 |
| F-stat (1st stage) | | 12.92 | 8.24 | | 11.27 | 6.27 | | 7.77 | 4.71 | | 10.42 | 7.30 | | 6.62 | 4.25 |
| Endogeneity | | 0.0049 | 0.0004 | | 0.0016 | 0.0235 | | 0.1095 | 0.0209 | | 0.0007 | 0.0409 | | 0.1981 | 0.0585 |
| Over-identification | | | 0.7193 | | | 0.0684 | | | 0.4763 | | | 0.0862 | | | 0.4416 |
| Under-identification | | 0.0022 | 0.0022 | | 0.0049 | 0.0190 | | 0.0054 | 0.0208 | | 0.0057 | 0.0106 | | 0.0152 | 0.0388 |
| Weak-identification | | 0.0020 | 0.0002 | | 0.0004 | 0.0001 | | 0.0781 | 0.0074 | | 0.0001 | 0.0003 | | 0.2389 | 0.1625 |
| $R^2$ | 0.432 | | | 0.405 | | | 0.428 | | | 0.313 | | | 0.317 | | |
| F-stat | 6.745 | 3.875 | 4.021 | 14.890 | 9.318 | 11.368 | 7.458 | 6.589 | 5.227 | 8.777 | 3.852 | 8.279 | 7.545 | 6.412 | 6.598 |

*Notes:* The variable GDPpc Developing in columns (1) - (3) is a dummy that is equal to 1 if a country is a developing nation according to the World Bank classification, 0 otherwise. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-9:** Robustness analysis IX: Results for business services using TEA

| | OLS (1) | 2SLS (2) | 2SLS (3) | OLS (4) | 2SLS (5) | 2SLS (6) | OLS (7) | 2SLS (8) | 2SLS (9) | OLS (10) | 2SLS (11) | 2SLS (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Year Dummies are included | | | FDI/GDP with Two Year Lag | | | LogGDPpc is included | | | GDPpc * GDPpc is included | | |
| $FDI/GDP_{\_Horizontal}$ | 0.011 | -0.316* | -0.208 | | | | 0.012 | -0.341* | -0.246* | 0.014 | -0.316* | -0.183 |
| | (0.034) | (0.177) | (0.138) | | | | (0.035) | (0.196) | (0.145) | (0.036) | (0.185) | (0.130) |
| $(FDI/GDP_{\_Horizontal})_{t-2}$ | | | | -0.003 | -0.312* | -0.272* | | | | | | |
| | | | | (0.036) | (0.165) | (0.145) | | | | | | |
| GDPpc 2 | 0.046 | 0.072 | 0.064 | 0.135 | 0.183 | 0.177 | | | | | | |
| | (0.182) | (0.230) | (0.211) | (0.187) | (0.238) | (0.229) | | | | | | |
| GDPpc 3 | -0.178 | -0.117 | -0.137 | -0.100 | 0.026 | 0.010 | | | | | | |
| | (0.312) | (0.345) | (0.332) | (0.345) | (0.357) | (0.361) | | | | | | |
| GDPpc 4 | -0.301 | -0.288 | -0.292 | -0.183 | -0.107 | -0.117 | | | | | | |
| | (0.363) | (0.430) | (0.401) | (0.395) | (0.443) | (0.439) | | | | | | |
| GDPpc 5 | -0.035 | 0.023 | 0.004 | 0.091 | 0.179 | 0.167 | | | | | | |
| | (0.297) | (0.347) | (0.330) | (0.331) | (0.378) | (0.375) | | | | | | |
| LogGDPpc | | | | | | | 0.007 | 0.045 | 0.035 | | | |
| | | | | | | | (0.119) | (0.151) | (0.141) | | | |
| GDPpc | | | | | | | | | | -0.000 | 0.000 | -0.000 |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| GDPpc * GDPpc | | | | | | | | | | 0.000 | -0.000 | -0.000 |
| | | | | | | | | | | (0.000) | (0.000) | (0.000) |
| Business Registration | -0.004* | -0.005* | -0.005* | -0.001 | -0.003 | -0.002 | -0.003* | -0.005* | -0.004** | -0.004* | -0.005* | -0.005** |
| | (0.002) | (0.003) | (0.003) | (0.002) | (0.003) | (0.003) | (0.002) | (0.003) | (0.002) | (0.002) | (0.003) | (0.002) |
| Survival Self-expression | 0.462*** | 0.559*** | 0.527*** | 0.467*** | 0.567*** | 0.554*** | 0.405*** | 0.502*** | 0.476*** | 0.442*** | 0.522*** | 0.490*** |
| | (0.144) | (0.167) | (0.147) | (0.163) | (0.200) | (0.187) | (0.123) | (0.144) | (0.129) | (0.134) | (0.149) | (0.132) |
| Traditional Rational | -0.219** | -0.222** | -0.221** | -0.196** | -0.176 | -0.179* | -0.249*** | -0.254*** | -0.253*** | -0.225*** | -0.250*** | -0.240*** |
| | (0.084) | (0.094) | (0.086) | (0.089) | (0.108) | (0.103) | (0.072) | (0.092) | (0.082) | (0.080) | (0.094) | (0.084) |
| Constant | 0.816*** | 1.095*** | 1.002*** | 0.837*** | 1.240*** | 1.188*** | 0.649 | 0.611 | 0.622 | 0.837*** | 0.997*** | 0.933*** |
| | (0.199) | (0.346) | (0.247) | (0.210) | (0.404) | (0.353) | (1.109) | (1.427) | (1.299) | (0.261) | (0.384) | (0.290) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 258 | 258 | 258 | 236 | 236 | 236 | 258 | 258 | 258 | 258 | 258 | 258 |
| Countries | 58 | 58 | 58 | 56 | 56 | 56 | 58 | 58 | 58 | 58 | 58 | 58 |
| Partial $R^2$ (first stage) | | 0.1243 | 0.1784 | | 0.1382 | 0.1542 | | 0.1152 | 0.1606 | | 0.1159 | 0.1800 |
| F-stat (first stage) | | 24.36 | 18.01 | | 25.02 | 14.03 | | 20.04 | 13.03 | | 21.77 | 20.14 |
| Endogeneity | | 0.0185 | 0.0579 | | 0.0186 | 0.0250 | | 0.0167 | 0.0181 | | 0.0199 | 0.0636 |
| Over-identification | | | 0.2324 | | | 0.4546 | | | 0.2975 | | | 0.2098 |
| Under-identification | | 0.0010 | 0.0002 | | 0.0009 | 0.0027 | | 0.0021 | 0.0012 | | 0.0014 | 0.0003 |
| Weak-identification | | 0.0243 | 0.0781 | | 0.0163 | 0.0550 | | 0.0230 | 0.0730 | | 0.0302 | 0.0944 |
| $R^2$ | 0.334 | | | 0.306 | | | 0.319 | | | 0.321 | | |
| F-stat | 7.977 | 4.053 | 4.870 | 10.358 | 3.943 | 4.308 | 7.969 | 3.272 | 3.869 | | 2.439 | 3.045 |

*Notes:* Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

**Table 2-A-10:** Robustness analysis X: Results for business services using TEA

| | OLS (1) | 2SLS (2) | 2SLS (3) | OLS (4) | 2SLS (5) | 2SLS (6) | OLS (7) | 2SLS (8) | 2SLS (9) | OLS (10) | 2SLS (11) | 2SLS (12) | OLS (13) | 2SLS (14) | 2SLS (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GDPpc Developing is included | | | OECD subsample | | | Non-OECD subsample | | | Developed countries (WB) | | | Developing countries (WB) | | |
| $FDI/GDP_{\_Horizontal}$ | 0.012 | -0.342* | -0.253* | -0.044 | -0.554** | -0.410** | 0.019 | 0.024 | -0.028 | -0.032 | -0.478** | -0.298** | 0.049 | -0.027 | 0.001 |
| | (0.034) | (0.189) | (0.141) | (0.042) | (0.216) | (0.191) | (0.040) | (0.123) | (0.110) | (0.043) | (0.200) | (0.136) | (0.049) | (0.154) | (0.110) |
| GDPpc Developing | -0.019 | -0.060 | -0.049 | | | | | | | | | | | | |
| | (0.190) | (0.221) | (0.209) | | | | | | | | | | | | |
| LogGDPpc | | | | -0.100 | -0.496 | -0.384 | 0.022 | 0.021 | 0.031 | -0.453 | -0.642 | -0.566 | 0.074 | 0.098 | 0.089 |
| | | | | (0.501) | (0.569) | (0.545) | (0.073) | (0.066) | (0.070) | (0.459) | (0.561) | (0.490) | (0.115) | (0.124) | (0.106) |
| Business Registra. | -0.003* | -0.005* | -0.005** | -0.007 | -0.008* | -0.008* | -0.000 | -0.000 | -0.001 | -0.008* | -0.011** | -0.010** | -0.000 | -0.001 | -0.001 |
| | (0.002) | (0.003) | (0.002) | (0.005) | (0.005) | (0.005) | (0.002) | (0.002) | (0.002) | (0.004) | (0.005) | (0.004) | (0.002) | (0.002) | (0.002) |
| Survival Self-expres. | 0.405*** | 0.510*** | 0.484*** | 0.400 | 0.740** | 0.644* | 0.623*** | 0.621*** | 0.642*** | 0.457*** | 0.604*** | 0.545*** | 0.693*** | 0.692*** | 0.693*** |
| | (0.107) | (0.128) | (0.118) | (0.292) | (0.357) | (0.338) | (0.213) | (0.196) | (0.215) | (0.150) | (0.217) | (0.171) | (0.210) | (0.209) | (0.199) |
| Traditional Rational | -0.251*** | -0.257*** | -0.255*** | -0.310*** | -0.343*** | -0.334*** | -0.000 | -0.002 | 0.018 | -0.348*** | -0.357** | -0.353*** | 0.143 | 0.124 | 0.131 |
| | (0.076) | (0.093) | (0.084) | (0.086) | (0.103) | (0.090) | (0.133) | (0.122) | (0.132) | (0.101) | (0.139) | (0.111) | (0.161) | (0.164) | (0.148) |
| Constant | 0.721*** | 1.061*** | 0.975*** | 2.339 | 6.351 | 5.221 | 0.447 | 1.090* | 1.084 | 5.554 | 8.101 | 7.274 | 0.114 | 0.733 | 0.802 |
| | (0.169) | (0.361) | (0.294) | (4.966) | (5.688) | (5.448) | (0.787) | (0.650) | (0.668) | (4.716) | (5.819) | (5.090) | (1.115) | (1.197) | (1.014) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 258 | 258 | 258 | 177 | 177 | 177 | 81 | 81 | 81 | 182 | 182 | 182 | 76 | 76 | 76 |
| Countries | 58 | 58 | 58 | 29 | 29 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 28 | 28 | 28 |
| Partial $R^2$ (1st stage) | | 0.1257 | 0.1741 | | 0.1614 | 0.1812 | | 0.1561 | 0.2255 | | 0.1809 | 0.2392 | | 0.1300 | 0.2094 |
| F-stat (1st stage) | | 24.64 | 20.69 | | 25.77 | 26.23 | | 28.10 | 14.47 | | 24.22 | 23.45 | | 28.04 | 24.61 |
| Endogeneity | | 0.0174 | 0.0246 | | 0.0021 | 0.0243 | | 0.9654 | 0.6330 | | 0.0041 | 0.0231 | | 0.6156 | 0.6225 |
| Over-identification | | | 0.2489 | | | 0.0144 | | | 0.4163 | | | 0.1121 | | | 0.7781 |
| Under-identification | | 0.0012 | 0.0004 | | 0.0020 | 0.0081 | | 0.0008 | 0.0012 | | 0.0015 | 0.0065 | | 0.0017 | 0.0020 |
| Weak-identification | | 0.0205 | 0.0674 | | 0.0102 | 0.0000 | | 0.8439 | 0.6666 | | 0.0003 | 0.0006 | | 0.8589 | 0.9570 |
| $R^2$ | 0.319 | | | 0.321 | | | 0.419 | | | 0.352 | | | 0.389 | | |
| F-stat | 7.452 | 3.311 | 3.823 | 9.138 | 5.763 | 6.200 | 5.608 | 4.678 | 12.668 | 7.394 | 5.868 | 7.137 | 6.960 | 18.464 | 11.479 |

*Notes:* The variable GDPpc Developing in columns (1) - (3) is a dummy that is equal to 1 if a country is a developing nation according to the World Bank classification, 0 otherwise. Robust standard errors are reported in parentheses and corrected for clustering by country. *** p<0.01, ** p<0.05, * p<0.1

## Appendix B: Mapping NAICS 2007 Industry Codes with ISIC rev. 3 Codes

Entrepreneurship data used in this work is based on the 4-digit ISIC rev. 3 industry classification whereas FDI data is available at the 6-digit NAICS level reflecting its 2007 update.[48] Therefore, some data adjustments were needed prior to the industry level analysis. Namely, we translated all NAICS 2007 data into the ISIC rev. 3 classification in order to ensure consistency between these two systems. One immediate problem we encountered is that there is no readily available correspondence table between NAICS 2007 and ISIC rev. 3 to ease data conversion. This is because, we believe, while the former classification is a relatively recent one, the latter reflects even an older version of its kind. Therefore, the concordance from NAICS 2007 to ISIC rev. 3 is performed in three stages. First, entrepreneurship data is converted[49] from ISIC rev. 3 to ISIC rev. 3.1. Next, M&A data based on NAICS 2007 codes is transformed into its 2002 version. At the final stage, M&A data at the 6-digit NAICS 2002 level is mapped into the 4-digit ISIC rev. 3.1 codes where correspondence tables are provided by the US Census Bureau.[50] One might argue that since NAICS is a newer classification of economic activities, it would have been a better approach to convert ISIC codes rather than vice versa. Unfortunately, the structure of the entrepreneurship data allowed us to make limited adjustments which ultimately conditioned us to seek a practical solution of which we apply.

While mapping NAICS 2002 codes into ISIC rev. 3.1 ones, some of the former codes in our data had more than one correspondence within the ISIC rev. 3.1 industry classification. These occurrences were rare. For instance, in 1999 we have 2298 M&A deals and only 106 observations out of this total map into multiple ISIC rev. 3.1 codes. Put differently, only ≈5% of all cases suffers from multiple mapping in 1999. The situation is also similar in other years. For observations having this characteristic, we proportionally allocated the value of an individual M&A deal into the corresponding ISIC rev. 3.1 codes.[51]

After the above adjustments are complete, our data is first allocated into four 'industry clusters' in which we aim to achieve as much homogeneity as possible within domain boundaries. As a further disintegration, we also classify our data into eleven 1-digit ISIC rev. 3.1 industries. The composition of each industry groupings at these two levels of disaggregation is presented in the following two tables.

[48] The 2012 update is also available but at the time that we obtained our M&A data (March, 2012) the Thomson SDC Platinum database was still using the 2007 codes.

[49] The concordance table between ISIC rev. 3 and ISIC rev. 3.1 is provided by the United Nation Statistics Division and is available at (retrieved on October, 22 2012):
http://unstats.un.org/unsd/cr/registry/regso.asp?Ci=23&Lg=1

[50] The used concordance tables are available on the US Census Bureau website (retrieved on October, 22 2012): http://www.census.gov/eos/www/naics/concordances/concordances.html

[51] We also applied an alternative method to the proportional allocation. When a 6-digit NAICS 2002 code maps into more than one ISIC rev. 3.1 codes, we counted how many of these ISIC codes fall into the same industry. If the total number of ISIC codes falling in the same industry has a clear majority over others, then this ISIC industry is used as the correspondence of that particular NAICS code. In the case where there is no clear majority in mapping, we read industry descriptions to find the best fit between the NAICS 2002 and ISIC rev. 3.1 codes. Furthermore, all industry level regressions reported in this paper also replicated after applying this mapping strategy. Indeed, the results obtained from these alternative regressions are qualitatively the same to those reported in the paper (FDI variable coefficients are often larger than we currently report).

**Table 2-B-1:** Composition of the industry clusters

| Industry Cluster | ISIC Section | ISIC 2-Digit Code | ISIC Rev. 3.1 Title |
|---|---|---|---|
| EXTRACTIVE | A | 01-02 | Agriculture, hunting and forestry |
| | B | 05 | Fishing |
| | C | 10-14 | Mining and quarrying |
| TRANSFORMATIVE | D | 15-37 | Manufacturing |
| | E | 40-41 | Electricity, gas and water supply |
| | F | 45 | Construction |
| | G | 50 | Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel |
| | | 51 | Wholesale trade and commission trade, except of motor vehicles and motorcycles |
| | I | 60-64 | Transport, storage and communications |
| CONSUMER-ORIENTED | G | 52 | Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods |
| | H | 55 | Hotels and restaurants |
| | L | 75 | Public administration and defence; compulsory social security |
| | M | 80 | Education |
| | N | 85 | Health and social work |
| | O | 90-93 | Other community, social and personal service activities |
| | P | 95 | Private households with employed persons |
| BUSINESS-SERVICES | J | 65-67 | Financial intermediation |
| | K | 70-74 | Real estate, renting and business activities |

**Table 2-B-2:** Composition of the 1-digit ISIC industries

| 1-Digit ISIC rev. 3.1 Industries | ISIC Section | ISIC 2-Digit Code | ISIC Rev. 3.1 Title |
|---|---|---|---|
| AGRICULTURE-FISHING | A | 01-02 | Agriculture, hunting and forestry |
| | B | 05 | Fishing |
| MINING-CONSTRUCTION | C | 10-14 | Mining and quarrying |
| | F | 45 | Construction |
| MANUFACTURING | D | 15-37 | Manufacturing |
| TRANSPORTATION-COMMUNICATION-UTILITIES | E | 40-41 | Electricity, gas and water supply |
| | I | 60-64 | Transport, storage and communications |
| | O | 90 | Sewage and refuse disposal, sanitation, and similar activities |
| WHOLESALE | G | 50 | Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel |
| | | 51 | Wholesale trade and commission trade, except of motor vehicles and motorcycles |
| RETAIL | G | 52 | Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods |
| HOTELS-RESTAURANTS | H | 55 | Hotels and restaurants |
| FINANCE-INSURANCE-REAL ESTATE | J | 65-67 | Financial intermediation |
| | K | 70 | Real estate activities |
| BUSINESS SERVICES | K | 71 | Renting of machinery and equipment without operator and of personal and household goods |
| | | 72 | Computer and related activities |
| | | 73 | Research and development |
| | | 74 | Other business activities |
| HEALTH-EDUCATION-SOCIAL SERVICES | L | 75 | Public administration and defence; compulsory social security |
| | M | 80 | Education |
| | N | 85 | Health and social work |
| CONSUMER SERVICES | O | 91 | Activities of membership organizations n.e.c. |
| | | 92 | Recreational, cultural and sporting activities |
| | | 93 | Other service activities |
| | P | 95 | Private households with employed persons |

## Appendix C: Additional Tables

**Table 2-C-1:** Sample countries

| | | | |
|---|---|---|---|
| Algeria | Egypt | Kazakhstan | Saudi Arabia |
| Angola | Finland | South Korea | Singapore |
| Argentina | France | Latvia | Slovenia |
| Australia | Germany | Lebanon | South Africa |
| Austria | Greece | Macedonia | Spain |
| Belgium | Guatemala | Malaysia | Sweden |
| Bolivia | Hong Kong (SAR) | Mexico | Switzerland |
| Bosnia & Herzegovina | Hungary | Morocco | Thailand |
| Brazil | Iceland | Netherlands | Tunisia |
| Canada | India | New Zeeland | Turkey |
| Chile | Indonesia | Norway | Uganda |
| China | Iran | Panama | United Arab Emirates |
| Colombia | Ireland | Peru | United Kingdom |
| Croatia | Israel | Philippines | United States |
| Czech Republic | Italy | Poland | Uruguay |
| Denmark | Jamaica | Portugal | Venezuela |
| Dominican Republic | Japan | Romania | |
| Ecuador | Jordan | Russia | |

*Notes:* The sample is based on model 3 in Table 2-3. There are 70 countries in total.

**Table 2-C-2:** M&A data summary

| Years | Total Number of M&A Deals |
|---|---|
| 1999 | 2298 |
| 2000 | 3004 |
| 2001 | 2496 |
| 2002 | 1745 |
| 2003 | 1674 |
| 2004 | 2043 |
| 2005 | 2570 |
| 2006 | 2337 |
| 2007 | 2611 |
| 2008 | 2348 |
| **Total** | **23126** |

**Table 2-C-3:** Linearity diagnostics: Variance inflation factors (VIF)

| Variable | VIF | 1/VIF |
|---|---|---|
| FDI/GDP | 1.16 | 0.865 |
| GDPpc 2 | 1.74 | 0.575 |
| GDPpc 3 | 1.64 | 0.608 |
| GDPpc 4 | 1.90 | 0.526 |
| GDPpc 5 | 1.92 | 0.521 |
| Business Registration | 1.28 | 0.780 |
| Survival Self-expression | 1.74 | 0.573 |
| Traditional Rational | 1.59 | 0.627 |
| Mean VIF | 1.62 | |

**Table 2-C-4:** Observation summary, by development stage

| Years | Number of Developing Countries | Number of Developed Countries | Total |
|---|---|---|---|
| 2000 | 2 | 17 | 19 |
| 2001 | 6 | 23 | 29 |
| 2002 | 9 | 25 | 34 |
| 2003 | 7 | 24 | 31 |
| 2004 | 6 | 27 | 33 |
| 2005 | 9 | 24 | 33 |
| 2006 | 17 | 24 | 41 |
| 2007 | 16 | 24 | 40 |
| 2008 | 21 | 20 | 41 |
| 2009 | 24 | 22 | 46 |
| Total | 117 | 230 | 347 |

*Notes:* The sample is based on model 3 in Table 2-3.

# Chapter 3 : Wage and Competition Effects of FDI on Entrepreneurship: Evidence from the Netherlands

## 3.1. Introduction[52]

The previous chapter examined the association between foreign direct investment and domestic entrepreneurship in a cross-country setting. The investigation utilizing cross-country variation in FDI and entrepreneurship is appealing because it permits broad generalizations to be made beyond one specific case study. In turn, this approach contributes to theory building and refinement pertaining to the integration of FDI as a determinant of entrepreneurship. However, studies using cross-country data are sometimes criticized due to their restrictive assumption of homogeneity in the relationship under consideration. By combining countries at different stages of development, the analysis is unable to capture and account for large variations in country-specific characteristics related to attracting FDI and entrepreneurship development. In short, our cross-country study in the previous chapter may be subject to aggregation bias. Furthermore, it is not possible to isolate the channels through which FDI affects entrepreneurship, for it requires sufficiently disaggregated data. Any inference drawn from a cross-country study provides a general understanding of the FDI-entrepreneurship nexus, but is less helpful in understanding the specific channels by which the effects of FDI are transmitted to domestic entrepreneurship. To tackle these considerations, we need to examine country-specific, firm-level data, which forms the focus of this chapter.

As discussed in the previous chapter, FDI may affect new firm creation simultaneously through various channels and in opposite directions. On the one hand, foreign firms equipped with superior technology bring in much needed technical expertise to host economies. Foreign-owned enterprises can act as external sources of innovation and as providers of tacit knowledge that can penetrate domestic firms and entrepreneurs, and thus pave the way for new firm creation. Knowledge may reach local entrepreneurs through several channels including labour mobility, demonstration, exports or training of suppliers. Therefore, foreign firms, willingly or unwillingly, become involved in the birth of domestic start-ups (Barrios et al., 2005). On the other hand, a large foreign presence can also coincide with the crowding-out of domestic enterprises, for example, due to intensified competition in product markets. Likewise, by paying higher wages, foreign-owned enterprises increase the incentives for wage-employment as opposed to entrepreneurship thereby making new firm creation less attractive (De Backer and Sleuwaegen, 2003). An increase in FDI presence could also lead to higher barriers to entry, constraining new firm creation.

An important shortcoming of the literature is the lack of attention to specific channels through which FDI impacts domestic entrepreneurship. So far, very few studies have considered the role of FDI in restructuring markets in host countries with a particular

[52] This chapter is a joint work with Utz Weitzel and Marzieh Abolhassani. S.H.Danakol collected the data, conducted the analysis, wrote the manuscript and worked on subsequent revisions; M. Abolhassani and U. Weitzel assisted in data collection, analysis and revisions.We appreciate helpful comments from seminar participants at the London School of Economics, Ege University, and Dutch Ministry for Economic Affairs (EZ) as well as from session participants at the 2014 International Association for Applied Econometrics Conference in London. We also gratefully acknowledge financial support from EZ.

focus on entrepreneurship within and across industries (Barbosa and Eiriz, 2009; De Backer and Sleuwaegen, 2003; Görg and Strobl, 2002; Lee et al., 2014). These studies investigate the direct relationship between FDI and entrepreneurship, or aspects thereof, but fail to analyse the mechanisms and reasons behind the observed FDI effects on local firm creation. Given the welfare-enhancing roles of entrepreneurship including economic growth, job generation and innovation, more country-specific in-depth studies are needed to shed light on the ways foreign presence and domestic entrepreneurship are related.

To fill the void, this study focuses on two prominent channels which influence entrepreneurial activities. We propose that FDI is indirectly related to new firm creation through a direct effect on industry competition and wages, which, in turn, reflects the rates of entrepreneurship. With regard to industry competition, the first channel, ownership advantages (i.e., advanced technology, product differentiation, economies of scale and managerial expertise) enable foreign firms to enter and expand quickly in local markets, altering competition. Previous studies confirm that the degree of competition is a key factor in determining the rates of firm births, although the direction of this effect is not always clear-cut (Geroski, 1995). Regarding wage levels, the second channel, several papers have concluded that foreign firms often pay higher wages even after controlling for the quality of the workforce (Görg and Greenaway, 2004). This may be due to, for example, having limited knowledge of the local labour market, or incentives to prevent information leakage which could strengthen the position of local rivals. Furthermore, by attracting innovative human capital, foreign firms may reduce local labour supply, increasing wages across the whole industry. A larger foreign presence in host country industries is usually associated with higher wages (Chen et al., 2011). If higher wages motivate potential entrepreneurs to choose wage-employment more often, the whole industry will experience lower domestic new firm entry.

Our study empirically investigates the role of FDI in explaining the rates of new firm formation through its effects on competition and wage levels in manufacturing industries. This work focuses on the Netherlands, a developed country with an open economy. It is valuable to consider the Dutch context since this country is a member of a wider collective, the European Union (EU), where increased integration of national practises is a shared goal for all involved. The unification of policies also encompasses issues related to entrepreneurship and FDI, suggesting that the EU member states tend to be more homogeneous in the respective domains over time. Therefore, despite the single country approach, the analysis of the Dutch case has relevance for other countries in the union, particularly for its core members excluding the southern periphery and the enlargement towards the East. The similarities between the Netherlands and other more developed EU countries are likely to be higher given their position and trajectory in economic development. We believe that the entrepreneurial base in the advanced economies is more prepared both to take advantage of the opportunities and to resist threats arising from FDI. Hence, the findings of this study can, with caution, be generalized to the core EU countries.

We find that new firm entry into Dutch manufacturing industries is not independent from the presence of FDI. We derive four results from the analysis where domestic entrepreneurship is measured as the rate of gross new firm entry. Specifically, entrepreneurship:

i) is negatively associated with wage levels which are found to be higher in industries with increased FDI presence,
ii) is positively associated with the degree of market concentration which is also higher in sectors with larger FDI presence,

iii) is not directly linked to FDI once the effects via wage and concentration channels are separated out,
iv) in low-tech industries but not in high-tech industries is related to the presence of FDI.

This study contributes to the research in this area in several ways. First, it is not a novel proposition that FDI effects on entrepreneurship may be transmitted through the channels of industry competition and wage levels. For example, stiff competition ensuing from foreign firms and its implications for domestic firm formation lie at the centre of the theoretical models of Markusen and Venables (1999), Lin and Saggi (2005), and Barrios et al., (2005). Likewise, the theoretical work by Grossman (1984) focuses on the labour market effects of FDI, and predicts a decrease in the number of local entrepreneurs because higher wages incentivize self-selection into wage-employment. What these studies share is that the predictions are provided based on a partial equilibrium framework, and a model in general equilibrium incorporating both product and factor market effects of FDI on entrepreneurship has yet to be developed. Our study complements this strand of research by considering both product and factor market implications of FDI in the same framework with a particular focus on industry competition and wage channels. To the best of our knowledge, this work is the first to empirically assess the relationship between FDI and domestic entrepreneurship simultaneously, through these two prominent channels.

Second, previous studies fail to distinguish between the entry of new firms with employees and the entry of single-owner firms. We think such a distinction is important for two reasons. To begin with, entrepreneurs of the latter type generally possess unique professional knowledge and skills that are not commonly available in the labour market (Parker, 2004). Hence, these entrepreneurs tend to serve niche segments which foreign firms may abstain from due to, for example, small market size. In turn, the rivalry between single-owner firms and foreign ones is not expected to be as high because of the minimal interaction with each other. Next, solo entrepreneurs are usually entitled to retain all profits, and have unlimited responsibility for all business losses and debts, compared to the ownership of the other types of firms. The heterogeneity in the level of foreign competition that single-owner firms is exposed to and variations in their entrepreneurial income can cause them to respond differently to the FDI presence through competition and wage channels. Thus, our work contributes to the literature by differentiating between these two types of new firm entries, and empirically investigating the effects of FDI on domestic entrepreneurship based on samples with, and without, single-owner firms.

A third contribution of this study is related to the larger sample size, extensive time span and the use of highly disintegrated data which advance previous studies (e.g., Barbosa and Eiriz, 2009; De Backer and Sleuwaegen, 2003; Görg and Strobl, 2002).

The structure of this chapter is as follows. Section 3.2 discusses the theoretical underpinnings of how FDI is related to competition levels and wage rates. We also develop our hypotheses here and lay the groundwork for the econometric specification composed of a set of equations that are estimated simultaneously. Next, section 3.3 presents the data and variables while section 3.4 focuses on the estimation method. Section 3.5 presents and discusses the results. Finally, section 3.6 concludes the chapter with directions for future research discussed in section 3.7.

## 3.2. Theoretical Background for FDI Channels

This section explores the theoretical foundations and relevant studies on the relationship between FDI on the one hand and industry competition and wages on the other. Moreover, we develop two main hypotheses with regard to these associations.

### 3.2.1. Competition Effects of FDI

From a theoretical point of view, the literature essentially proposes two competing arguments with regard to the effects of FDI on market structure in the host country. First, it is possible that foreign firms primarily penetrate industries with high barriers to entry for domestic enterprises. As foreign firms need strong ownership advantages to enable internationalization, they may overcome various sources of entry barriers more easily than domestic firms (e.g., capital requirements or specific know-how barriers). Hence, FDI presence can increase the degree of competition offering a solution to the monopoly problem (Caves, 1996). Likewise, Teece (1985) makes the point that foreign entry is a response to market failure hence domestic industries witness upward competitive pressures and a reduction in the market share of the leading host country firms.

Yet, this conclusion does not go unchallenged. Casson (1986) argues that foreign investors are increasingly lured by host countries because of monopoly rents. Indeed, explanations of FDI based on ownership advantages place an emphasis on the notion that firms expand abroad in order to tap monopoly profits through the exploitation of their competitive advantages such as knowledge, technology, organizational, managerial and marketing skills. Hence, the increase in FDI presence might speed up industry concentration,[53] and depress competition. Elsewhere it has been argued that anti-competitive effects are foreseeable because foreign firms, which are larger in size, create their own barriers for further competition by increasing the industry's minimum efficient scale (Forte, 2013). This would eventually intensify the monopoly problem.

Given the conflicting theoretical predictions, the answer is essentially an empirical one. The empirical results, however, are also mixed, which mirrors the theoretical ambiguities. Blomström (1986), for example, shows that an increase in the level of foreign presence in Mexican manufacturing industries coincides with increases in market concentration. In a more recent study on India, Singh (2011) reports similar findings. In contrast, Driffield (2001) concludes that the existence of foreign firms in the manufacturing industries in the UK reduces the concentration ratio. Nonetheless, the majority of research in this field seems to find a positive association between FDI and the degree of concentration in host country industries.[54] It is very difficult, however, to establish causal links. Upward trends in concentration can be caused by foreign firms—upon large scale entry or they are driven by good profit opportunities in concentrated

[53] The assumption maintained throughout this chapter is that lower (higher) industry concentration is regarded as proxying more (less) competition. This is a widely used approach and has been frequently employed in studies. There might be some cases where this assumption does not hold, however. Even though changes in concentration levels are responsive to the alterations in the underlying competitive environment, these measures may not go in the right direction. For instance, think of an industry composed of many small firms, and assume that this industry is highly protected by the government regulation, and thus the entry of large scale and productive firms is barred. Later on, upon a policy change which lifts the entry barrier, one large firm operating at a higher productivity level enters the market, and drives many of these small and unproductive firms out of business. The consequence is that although the degree of concentration witnesses an upward trend, the elimination of the entry barrier can sensibly be viewed as an increase in competition.

[54] See, Dunning (1993), Caves (1996) and Forte (2013) for surveys.

markets in host country industries. In fact, the causality behind a positive association between FDI and market concentration remains open (Caves, 1996).

The terrain of entrepreneurship in host countries is likely to be modified to reflect the changing levels of competition (concentration) brought by FDI. In this regard, different theories predict different relationships between industry concentration and domestic firm entry. First, a common explanation is that existing firms engage in non-competitive pricing mechanisms or other collusive arrangements to take advantage of excess profit opportunities in concentrated markets. In short, firms operating in concentrated industries can artificially inflate prices as opposed to firms operating within highly competitive markets. The expected higher profits in concentrated industries may stimulate entrepreneurship consequently higher profits are eroded over time. To eliminate this possibility, existing firms may adopt a static limit pricing strategy (Bain, 1956; Modigliani, 1958). The limit price is the highest price at which new firm formation is deterred, but is below the profit-maximizing price level. This action allows firms in concentrated markets to sacrifice their immediate profits while protecting long-term profit interests by forestalling new entry (Bain, 1956). Consequently, a negative relationship between industry concentration and entrepreneurship is predicted under the static limit pricing model. Conversely, firms in concentrated markets may implement a dynamic limit pricing strategy which balances their current and future profits (Gaskins, 1971). Under this alternative, new firms enter the market in response to the dynamic prices set by the existing firms and expected profits. Consequently, a positive relationship between industry concentration and entrepreneurship is predicted under this model (Cotterill and Haller, 1992).

Additionally, domestic entrepreneurship may take place in concentrated markets if existing firms do not feel threatened by a loss of market share, for example, because some customers are not adequately supplied. When concentration levels are high, new firms may avoid displacing the market share of existing firms, but attempt to create new ones, seeking new customers. This reasoning is in line with resource partitioning theory—increasing concentration creates opportunities for new firms that adopt a niche market focus (Carroll, 1985).

In contrast to the aforementioned reasoning, the contestable market theory, introduced by Baumol et al., (1982), implies no relationship between market concentration and new firm formation. In contestable markets, where firms can enter and exit rapidly, the threat from potential new firm entry forces existing firms to reduce prices and thereby profits. In short, whether a market is concentrated or not, is largely irrelevant for entrepreneurship (Geroski and Masson, 1987). Finally, a similar inference comes from the Chicago School approach. This perspective suggests that, in highly concentrated industries, existing firms may have high profits because they possess unique skills and resources. There is no need to exercise collusive action to deter new firm formation because firms owe their dominant position and above-normal profits to their exclusive technology and capabilities. As profits are firm-specific, they do not attract new entry (Stigler, 1983). Put differently, one should expect no difference between concentrated and non-concentrated markets in their ability to attract new businesses.

***Testable Hypotheses***

It is more likely that FDI wipes out competition, and consequently exacerbates industry concentration in developing countries which has been attributed to, for example, high technology gaps between foreign and domestic firms (Amess and Roberts, 2005; Blomström, 1986). In contrast, local firms in developed economies may already possess

the technology that foreign firms bring, and are therefore able to compete with them (OECD, 2002). The Netherlands, a developed country, attracts FDI predominantly from advanced economies where technological proximity is expected to be high between Dutch and foreign firms. As Driffield (2001) suggests, when differences in technological and organizational capabilities are small, FDI is likely to be pro-competitive, and reduces industry concentration. Furthermore, in developed countries stringent antitrust laws are in place to prohibit anti-competitive behaviour such as price-fixing amongst firms (including foreign ones), which may impede new firm formation. However, tacit collusion, the implicit coordination of existing firms for anti-competitive strategies, may still take place but strictly enforced antitrust laws could eliminate such practices. In line with this reasoning, we hypothesize that:

**Hypothesis 1a:** *FDI in the Netherlands, a developed host country, reduces concentration in manufacturing industries.*

**Hypothesis 1b:** *The reduction in market concentration in turn encourages domestic entrepreneurship within the same industry.*

This study treats FDI as a uniform resource concerning the entry mode since our firm-level data does not permit us to differentiate between greenfield and M&A. Yet the aggregate figures indicate that the majority of FDI in the Netherlands takes the form of M&A. At the outset, M&A involves the transfer of ownership rights rather than the addition to the local production capacity. Accordingly, with regard to hypothesis 1a, one could argue that FDI in this context is more likely to increase industry concentration as opposed to what is suggested. We are of the opinion that such reasoning is especially pertinent in the M&A deals taking place between domestic firms. In contrast, cross-border M&A projects can contribute to a more pro-competitive environment by acting as the vanguard of new foreign entrants in the domestic economy. Furthermore, M&A prevents concentration levels from rising by preserving local firms which otherwise would cease operating. As UNCTAD (2000) puts forward, in the long run, the independent effects of greenfield and M&A on host countries in various domains, including industry concentration, are indistinguishable. For example, following cross-border M&A, foreign acquirers often expand domestic operations through subsequent investments. FDI via the M&A route tends to contribute to the production capacity just as greenfield FDI does, but this impact materializes over a longer time horizon. Given the 15-year coverage of our data, we have sufficient confidence that our analysis captures this conceptualization, and provides justification for hypothesis 1a. While we acknowledge that the capacity to engage in anticompetitive practises is greater under M&A than greenfield, such actions are largely precluded in the Dutch context where rigidly enforced and credible laws are in place.

### 3.2.2. Wage Effects of FDI

A vast literature is devoted to the consequences of foreign presence on local labour market conditions. Of particular interest to this study are the effects of FDI on wage levels.

First, increased wages in host countries can be attributed to productivity growth induced by foreign firms. For instance, access to foreign knowledge may foster human capital formation as well as bring productivity gains to domestic firms. Learning from foreign firms is viewed as a central vehicle of technology transfer. Provided that technology introduced by foreign firms is internalized by domestic labour force and knowledge spreads into local enterprises, domestic employees may become more productive over time (Aitken et al., 1996). This allows local companies to reduce

inefficiencies, leading to productivity growth and higher productivity raises wage rates in the domestic economy (Driffield and Taylor, 2000).

Second, foreign firms might also create upward pressures on wages by raising the demand for labour (Das, 2002). Hence, the FDI-induced competition in labour markets can force domestic firms to increase wages with the aim of attracting a better qualified workforce. However, concerns have been expressed that foreign firms and their domestic counterparts may operate in different labour markets. That is factor demand of firms in each category may substantially differ. For example, foreign firms may prefer to hire a highly skilled workforce, because the technology that accompanies FDI is expected to be complementary to the skilled labour which is capable of absorbing knowledge on firm-specific assets. An increase in foreign capital would then increase demand and wages for highly skilled labour.

Such segmentation in labour markets creates less scope for positive effects on wages as the mobility of skilled labour towards domestic firms would be limited. Furthermore, by poaching the better workers, foreign firms may lower both the quality of labour and wage rates in domestic firms (Driffield and Girma, 2003).

Besides positive wage spillovers, higher wages in host countries may also reflect the fact that foreign firms generally pay higher wages than their domestic counterparts both in developed and developing countries (Almeida, 2007; Görg and Greenaway, 2004; Heyman et al., 2007). This observation is attributed to their larger size together with being more capital- and skill-intensive. In fact, productivity advantages stemming from these properties tend to be a source of wage differentials. There is corroborative evidence for this. For example, Canyon et al., (2002) find a wage differential of 3.4% across foreign and domestically-owned firms in the UK manufacturing industries caused solely by productivity. There are other plausible reasons why foreign firms pay a higher price for labour.

First, offering wage premiums might be necessary to attract qualified workers when, as is often the case, knowledge about local market conditions is inadequate. Furthermore, incentives to reduce labour turnover can also motivate foreign firms to offer higher wages. This would be important for foreign firms if they want to minimize the risk of leakage of proprietary knowledge, or of employee skills augmented through on-the-job training. Third, the local labour force may have a preference for employment in domestic enterprises, for example, if jobs elsewhere are viewed as less secure. Wage premiums may act as a response to this 'home bias' in choosing a preferred employer. Finally, internal fairness policies within foreign firms may aim at reducing wage gaps between employees across different locations, thus motivating higher wages.

From the above discussion, it is evident that wage rates in host countries are in part explained by the existence of foreign firms. The combination of higher wages in foreign firms and positive wage spillovers to domestic firms represents higher overall wages. It is not clear however, what the implications of wage increases motivated by FDI are on domestic entrepreneurship.

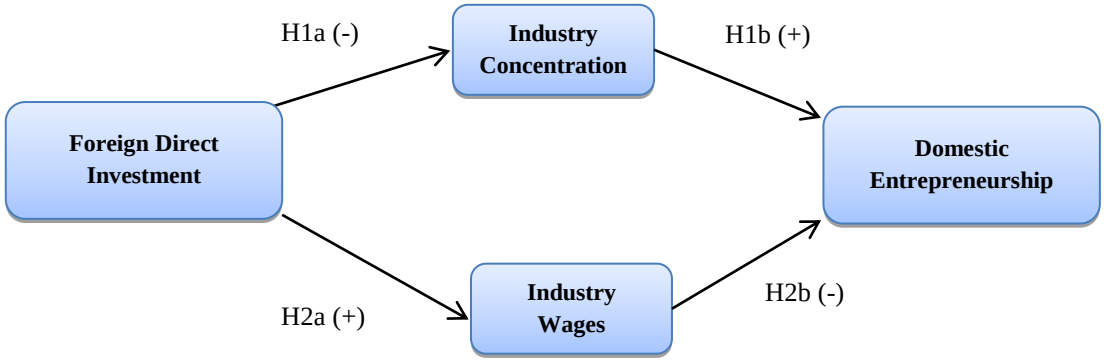
Potential entrepreneurs constitute an untapped resource for the development of national economies. When a market opportunity is recognized, future consequences of pursuing a course of action towards its commercialization need to be evaluated in detail. That is, entrepreneurs face an occupational choice. They tend to compare wage-employment at an established firm to the potential profits from venture creation (Parker, 2009). Entrepreneurial ideas are exploited provided that accompanying benefits outnumber alternatives. In this regard, by increasing overall wage rates and offering wage premiums in host countries, foreign firms may influence the trade-off between wage-employment and

entrepreneurship in favour of the former. Prospective entrepreneurs would be hired by foreign-owned firms that offer higher wages and promising career opportunities. Entrepreneurs with their expertise in various domains may be especially complementary to the advanced technologies introduced by foreign firms. Thus, recruiting entrepreneurially-talented individuals can bring numerous advantages to foreign firms, which are compensated with an attractive wage. As this gives rise to a smaller pool of future entrepreneurs (De Backer and Sleuwaegen, 2003; Grossman, 1984; Lee et al., 2014), FDI may significantly restrict new firm creation in host countries. In line with this reasoning, we hypothesize that:

**Hypothesis 2a:** *FDI in the Netherlands increases wage levels in manufacturing industries.*

**Hypothesis 2b:** *Increased wage rates subsequently discourage entrepreneurship within the same industry.*

**Figure 3-1:** An integrative model of the developed hypotheses




The customary conceptualization of entrepreneurship involves new firm creation outside an existing organization. In recent years, however, it has been recognized that entrepreneurial activities also take place within established firms through what is known as corporate entrepreneurship or intrapreneurship (Parker, 2011). Broadly speaking, intrapreneurship is defined as the spirit of entrepreneurship within existing organizations, and its manifestations appear in a variety of forms. Above all, intrapreneurship refers to the practice of new firm formation, although it is considerably broader in scope. It is the process of exploiting opportunities, creating economic value through innovation and creativity as well as proactiveness. The introduction of new markets, products, services and production processes together with enhancements to extant techniques is considered as corporate entrepreneurship (Antoncic and Hisrich, 2001). Entrepreneurship within established firms helps organizations to revitalize and improve performance (Kuratko et al., 1990), which in turn supports economic development at the aggregate level. As not all entrepreneurially-minded and creative people are good at starting up a company this raises the question regarding which entrepreneurial role creates greater welfare effects: a talented individual employed, for example, in a technologically advanced foreign firm or a talented individual who starts own company? This question lies beyond the scope of this study, but it highlights the importance that wage-employment of potential entrepreneurs is not per se suboptimal.

## 3.3. Data

The data for this study is made available by Statistics Netherlands (Centraal Bureau voor de Statistiek, CBS). In order to build the dataset used in the analysis, we combine a number of CBS databases. We start with the Business Register, which incorporates the whole population of firms and reports annual statistics including the number of employees, detailed industry codes of the establishment and its location. From this database we also extract the information whether a firm is newly formed or already existing. We focus on manufacturing data as this is the industry that has the most detailed data and covers the longest time period from 1996 until 2010 (after merging all other datasets, see below).

We then merge the Business Register with Production Statistics, which is compiled annually and reports information on, amongst others, wages, sales, research and development expenses, total energy and advertising as well as training costs for the firms included in the Business Register. For the FDI variable, another database, the Financial Statistics of Large Enterprises (SFGO)[55] provides data on the percentage of firms' equity owned by foreign investors.[56] The SFGO incorporates firms with a turnover of minimum €22.69 million.[57] We use the SFGO to identify the presence of FDI per firm and industry. From the SFGO, together with its equivalent for small firms (SFKO)[58] we also obtain data on capital stocks.[59] Unfortunately, due to missing variables and inconsistencies in reporting, foreign ownership data for small firms in the SFKO cannot be used. Our FDI measure is therefore limited to investments into firms with a turnover of at least €22.69 million, which account for the large majority of foreign investment.[60]

The data on age structure and gender composition of the workforce comes from the Municipal Personal Records Database (GBA).[61] Finally, the skill level of the labour force is made available via the source Educational Level (Opleidingsniveau) which utilizes the International Standard Classification of Education (ISCED) maintained by the United Nations. Each firm in our dataset has a unique identification number which enables us to link all data sources discussed above into one data file. The observations at the firm level are then aggregated at the industry level based on the NACE rev. 1.1 classification at 5-digit level (SBI 5 level)[62] of manufacturing industries. The final sample covers the years between 1996 and 2010 comprising 3674[63] industry-year observations that span 245 industries, over a 15-year period. Please note that the FDI variable is missing for one industry in 1996, and hence the sample size is equal to 3674 rather than 3675.

[55] 'Statistiek financiën van grote (niet-financiële) ondernemingen' in Dutch.
[56] We define all firms with positive equity ownership as foreign even though the firm may not be majority foreign-owned. Nonetheless, most firms with foreign equity ownership in the sample (around 80%) are either majority or fully foreign-owned.
[57] This amount is equal to approximately 50 million Guilders in pre-Euro times.
[58] 'Statistiek financiën kleine ondernemingen' in Dutch.
[59] As of 2000, the SFGO and SFKO are merged into a single dataset; so-called 'statistics on finances of non-financial enterprises' (NFO-statistiek financiën van niet-financiële ondernemingen in Dutch). However, the SFGO is still available by itself.
[60] Please see the limitations section for details.
[61] 'Gemeentelijke basisadministratie persoonsgegevens' in Dutch.
[62] The SBI stands for 'standaard bedrijfsindeling' which corresponds to the Dutch version of the NACE industry classification.
[63] This value is based on the model 1 in Table 3-3 where no lag structure for the independent variables is taken into account. Alternative models with different lag lengths and the breakdown of industries based on their technological intensity culminate in different number of observations.

## 3.4. Estimation Methodology: System of Structural Equations

As discussed in the respective section, FDI may be simultaneously linked to new firm creation directly and/or via several channels. Hence, to analyse whether FDI presence in Dutch manufacturing industries is directly or indirectly related to domestic entrepreneurship via wage and/or competition channels we specify a system of three structural equations. This system considers, on the one hand, the effect of FDI on entrepreneurship, on wages, and on market concentration, while, on the other hand, it takes into account that wage and concentration levels may also have an effect on entrepreneurship. The three structural equations are constructed as follows:

**Equation 3.1:** Entrepreneurship specification

$$ENTRY_{it} = \beta_1 + \beta_2 FDI_{it} + \beta_3 lnWAGE_{it} + \beta_4 HHI_{it} + \beta_5 GROWTH_{it} + \beta_6 MES_{it} + \beta_7 CAPITAL_{it} + \beta_8 R\&D_{it} + \beta_9 ADVERTISING_{it} + \beta_{10} REGION_{it} + INDUSTRY\ DUMMIES + YEAR\ DUMMIES + \varepsilon_{it}$$

**Equation 3.2:** Concentration specification

$$HHI_{it} = \lambda_1 + \lambda_2 FDI_{it} + \lambda_3 lnSIZE_{it} + \lambda_4 GROWTH_{it} + \lambda_5 MES_{it} + \lambda_6 CAPITAL_{it} + \lambda_7 R\&D_{it} + \lambda_8 ADVERTISING_{it} + \lambda_9 REGION_{it} + INDUSTRY\ DUMMIES + YEAR\ DUMMIES + \eta_{it}$$

**Equation 3.3:** Wage specification

$$lnWAGE_{it} = \alpha_1 + \alpha_2 FDI_{it} + \alpha_3 CAPITAL_{it} + \alpha_4 ENERGY_{it} + \alpha_5 TRAINING_{it} + \alpha_6 AGE_{it} + \alpha_7 FEMALE_{it} + \alpha_8 SKILL_{it} + \alpha_9 REGION_{it} + INDUSTRY\ DUMMIES + YEAR\ DUMMIES + \nu_{it}$$

In all three equations, the index *i* refers to industries and *t* refers to years. $ENTRY_{it}$ is the gross entry rate defined as the number of domestic firm entries at time *t* divided by the total number of firms in the same period in industry *i*. $FDI_{it}$ is computed as the employment in foreign-owned firms weighted by firms' foreign equity participation divided by total employment in industry *i* at time *t*.

While $lnSIZE_{it}$ is the industry size measured through the log of the total number of employees, $GROWTH_{it}$ refers to the industry's annual employment growth rate. $MES_{it}$ is the minimum efficient scale which measures the average firm size in industry *i*, and is defined as the industry's total employment divided by the number of firms in the same industry. $CAPITAL_{it}$ is the capital-labour ratio, which is defined as capital stock divided by the number of employees in industry *i*. $R\&D_{it}$ is research and development expenditures over sales, and $ADVERTISING_{it}$ is advertising expenditures over sales. Furthermore, $lnWAGE_{it}$ is defined as the log of average wages for each 5-digit NACE rev. 1.1 industry at year *t*. $ENERGY_{it}$ is the energy cost per employee, $TRAINING_{it}$ is the training cost per employee, $AGE_{it}$ is the average age of the workforce, $FEMALE_{it,}$ is the proportion of female workers and $SKILL_{it}$ is the share of employees who have a college education in industry *i*. The variable $SKILL_{it}$ serves as a proxy for highly-skilled workers.

Likewise, $HHI_{it}$ is the Herfindahl index of industry concentration defined as the sum of the squares of the market shares of all firms in industry *i*. The variable $REGION_{it}$ is computed as the proportion of firms in industry *i* that are located in certain regions; namely North Holland, South Holland or North Brabant. This variable controls for spatial

heterogeneity. Finally, INDUSTRY DUMMIES are added to each model to account for the unobserved industry-specific time-invariant effects. Likewise YEAR DUMMIES are incorporated to capture the unobserved time-varying effects. $\varepsilon_{it}$, $\eta_{it}$ and $\nu_{it}$ are disturbance terms.

Our analysis applies the method of Tavares and Wacziarg (2001) and Wacziarg (2001) to the entrepreneurship literature in connection with FDI, and we estimate all three entry, concentration and wage specifications simultaneously by using the three-stage least squares (3SLS). This technique allows entry rates, concentration and wage levels to be determined concurrently within the system. Serving as a foundation for our empirical approach, Wacziarg (2001) investigates the impact of trade policy on economic growth transmitted through six channels[64] in a cross-country setting. Similarly, Tavares and Wacziarg (2001) study the relationship between democracy and economic growth by focusing on seven channel variables that contribute to this association.[65] Our study differs from theirs in two aspects. First, the growth specification in both articles—corresponding to the entry equation in this context—includes only the channel variables along with a set of control variables. The measures of trade policy in Wacziarg (2001) and of democracy in Tavares and Wacziarg (2001) are left out from the growth specification. The authors argue that the comprehensive list of the channel variables sufficiently accounts for the effects of these two measures on economic growth. In contrast, we incorporate FDI together with the channel variables into the entrepreneurship equation. Since the present study is confined only to lnWAGE and HHI as the channels transmitting the indirect effects of FDI on domestic entrepreneurship, the inclusion of FDI in the entry regression separately captures any effect that is not covered by the factors selected. The second way we depart from their empirical setting is that while our analysis treats FDI as exogenous to the system of equations, the functionally equivalent variables (i.e., democracy and trade policy) are considered endogenous in Tavares and Wacziarg (2001) and Wacziarg (2001). Hence, separate structural equations for these variables are specified, and estimated jointly[66] with the channel and growth regressions. Finally, our work is analogous to these two studies in the sense that the FDI variable appears in the channel specifications (equations 3.2 and 3.3), with democracy and trade policy are assigned the same role in the respective analysis.

Introduced by Zellner and Theil (1962), 3SLS is a full-information approach because it makes use of knowledge of all the restrictions in the system of structural equations when estimating the parameters. Put differently, it allows for contemporaneous correlation in the disturbances across equations. We applied the Breusch-Pagan test of independence to assess whether the cross-equation error covariance exists in the data (Greene, 2011), and confirmed the need for the simultaneous estimation approach. By deriving a single covariance matrix for the error terms through joint estimation, 3SLS lead to efficiency gains compared to the estimation of each equation independently. However, this betterment in efficiency is coupled with a caveat. Any misspecification in any single equation affects the entire system. We therefore took great care to specify the individual structural equations in line with previous literature (see below) and ran numerous robustness checks. Moreover, the Hausman specification test verified that the system of structural equations is properly specified. The scope for efficiency gains from 3SLS is

[64] These are price distortions, government consumption, FDI, manufactured exports, investment and macro policy quality.

[65] These are human capital, inequality, instability, price distortions, openness, government size and investment.

[66] While the analysis in Wacziarg (2001) is based on a structural model composed of eight specifications (i.e., growth, trade policy and six channels), Tavares and Wacziarg (2001) utilize nine specifications where the level of growth, democracy and channel variables are determined simultaneously.

slight if the contemporaneous correlation among the errors is weak, and 3SLS reduces to 2SLS in the absence of the cross-equation dependence. To evaluate the statistical merits of employing 3SLS rather than 2SLS, we conducted the Hausman test again, and the resulting evidence suggests that the former is the appropriate estimation technique in this setting.

The joint estimation of entry, concentration and wage specifications points to endogeneity concerns as lnWAGE and HHI appear on the right-hand-side of equation 3.1. 3SLS yields consistency but this necessitates appropriate instrumenting for each endogenous variable in our system. The first-stage of 3SLS deals with this challenge where endogenous measures are regressed on all exogenous variables to obtain their fitted values used as valid instruments. The second-stage involves estimating each specification in the system separately via 2SLS utilizing the instruments derived in the first-stage. This enables the construction of the covariance matrix for the disturbances of the system of structural equations. Finally, in the third-stage, both the estimated covariance matrix from the second-stage and the predicted values of the endogenous variables retrieved in the first-stage are used to perform the generalized-least squares estimation.

Some assumptions should hold for the 3SLS method to be applicable. More specifically, a sufficient number of instruments must be excluded from each specification in the system for the order condition to be satisfied. This amounts to the omission of exogenous variables whose count should be at least equal to the number of endogenous regressors in the respective equation. With regard to the entry, concentration and wage specifications, the number of exclusions is sufficient for the order condition of the identification to be valid.

***Details on Control Variables***

The inclusion of the control variables in each of the three specifications is in line with earlier studies on firm entry, market concentration and wage rates. We start with equation 3.1. Here, entry into industries with higher growth potential is often found to be easier. Therefore, we expect a positive association between gross entry rates and the variable GROWTH. On the other hand, MES, CAPITAL and ADVERTISING may serve as entry barriers for new firms with higher values indicating higher barriers to entry. Given this information, a negative relationship between these measures and gross entry is plausible.

As has been suggested in the empirical literature, the potential effects of R&D on entry rates are unclear. On the one hand, the rates of new entrants can be larger when there is a relatively high level of technological opportunity or R&D intensity. On the other hand, high R&D expenditures may act as a barrier to entry in deterring potential new entrants. The use of all these variables is prevalent in the literature and has proven important in explaining firm entry rate (e.g., Acs and Audretsch, 1989; Barrios et al., 2005; Geroski, 1995; Mata, 1993).

With respect to the determinants of industry concentration in equation 3.2, we expect the variables lnSIZE and GROWTH to have a negative association with HHI as, with all being equal, larger and growing industries can accommodate more firms. MES, CAPITAL and ADVERTISING are control variables for market barriers to entry. As higher barriers deter new firm creation we anticipate a positive relationship between industry concentration and these measures. Furthermore, if larger R&D intensity expands the range of opportunities for new entry, such practice would diminish market concentration. In contrast, if it acts as an entry barrier, concentration rates tend to rise with increases in R&D intensity. The importance of these variables in determining industry concentration is widely discussed in the literature (e.g., Blomström, 1986; Driffield, 2001; Forte, 2013).

**Table 3-1:** Pairwise correlations

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $ENTRY_{it}$ | 1 | | | | | | | | | | | | | | | |
| $FDI_{it}$ | -0.006 | 1 | | | | | | | | | | | | | | |
| $HHI_{it}$ | 0.081 | 0.036 | 1 | | | | | | | | | | | | | |
| $lnWAGE_{it}$ | 0.020 | 0.182 | 0.055 | 1 | | | | | | | | | | | | |
| $lnSIZE_{it}$ | 0.010 | 0.120 | (-0.558) | 0.066 | 1 | | | | | | | | | | | |
| $GROWTH_{it}$ | 0.123 | -0.021 | 0.005 | -0.040 | 0.057 | 1 | | | | | | | | | | |
| $MES_{it}$ | 0.028 | 0.290 | 0.075 | 0.113 | 0.214 | 0.180 | 1 | | | | | | | | | |
| $CAPITAL_{it}$ | 0.030 | 0.026 | 0.015 | -0.004 | -0.000 | -0.010 | 0.004 | 1 | | | | | | | | |
| $R\&D_{it}$ | 0.032 | 0.013 | 0.090 | 0.006 | 0.081 | -0.003 | 0.066 | -0.001 | 1 | | | | | | | |
| $ADVERTISING_{it}$ | -0.018 | 0.010 | -0.022 | -0.240 | -0.038 | -0.030 | 0.005 | -0.001 | 0.068 | 1 | | | | | | |
| $AGE_{it}$ | -0.106 | 0.153 | 0.113 | (0.342) | -0.194 | -0.046 | 0.130 | -0.013 | -0.050 | -0.145 | 1 | | | | | |
| $FEMALE_{it}$ | 0.008 | -0.152 | 0.041 | -0.179 | -0.078 | -0.046 | -0.178 | 0.010 | -0.030 | 0.152 | -0.001 | 1 | | | | |
| $SKILL_{it}$ | 0.073 | 0.149 | 0.113 | -0.036 | -0.002 | 0.051 | 0.270 | 0.020 | 0.106 | 0.139 | -0.002 | -0.018 | 1 | | | |
| $TRAINING_{it}$ | 0.002 | (0.355) | 0.107 | 0.159 | 0.066 | -0.009 | 0.289 | -0.002 | 0.146 | -0.016 | 0.133 | -0.103 | 0.271 | 1 | | |
| $ENERGY_{it}$ | 0.025 | 0.307 | 0.145 | 0.186 | -0.046 | -0.034 | 0.292 | 0.010 | -0.030 | -0.106 | 0.200 | -0.145 | 0.169 | (0.332) | 1 | |
| $REGION_{it}$ | 0.071 | -0.036 | -0.037 | -0.054 | 0.073 | -0.001 | 0.010 | 0.021 | 0.012 | 0.040 | -0.030 | 0.175 | 0.083 | 0.017 | 0.076 | 1 |

*Notes:* N=3674. Correlations are based on model 1 in Table 3-3. The values greater than an absolute cut-off of 0.3 are shown in parentheses.

With regard to the wage specification, equation 3.3, the literature suggests that capital intensive industries have a higher marginal product of labour, and thus pay higher wage rates (Görg and Greenaway, 2004). Likewise, in industries where the average skill levels are higher, the workforce is paid higher wages due to the skill premium (Lipsey and Sjöholm, 2004). Given this observation, it is plausible to anticipate a positive link between wage rates and the variables CAPITAL and SKILL. Second, we also predict the variable ENERGY, which proxies for labour productivity, to be positively related to the wage level. Furthermore, previous studies suggest significant female-male wage differentials where women employees are often paid less (Aitken et al., 1996). Finally, we expect the variables AGE and TRAINING to influence average industry wages positively as the labour force acquires additional skills and competences through work experience and on-the-job training.

The pairwise correlations and descriptive statistics are presented in Table 3-1 and Table 3-2. Moreover, Table 3-A-1 in the appendix section describes variables used in the analysis in further detail, providing an overview.

An examination of the correlation matrix in Table 3-1 suggests that pairwise correlations between independent variables used in equations (3.1 through 3.3) fall below the 0.3 rule of thumb, thus, no multicollinearity problem exists in the analysis. The two exceptions are the associations between the variables TRAINING on the one hand, and FDI and ENERGY on the other. The corresponding correlation coefficients are 0.36 and 0.33 respectively. While these values are beyond the established rule of thumb of 0.3, it is slight. Therefore, there are no major concerns with regard to multicollinearity among the explanatory variables.

Descriptive statistics in Table 3-2 provide useful information on the data. We can see that the gross entry rate in Dutch manufacturing industries is on average 7.7% over the sample period. Furthermore, foreign firms on average account for 17.3% of industry employment, with the minimum and maximum values observed at 0% and 100%. This pattern within foreign employment suggests that while certain industries fail to attract FDI inflows, other sectors are entirely dominated by them. Table 3-2 also shows that Dutch manufacturing firms employ on average 48.6 people with an average age of 39.17, of which approximately 25% are female and 26% are highly-skilled.

In the US, an industry is considered as moderately concentrated if its HHI index falls between 0.15 and 0.25, a value in excess of 0.25 points out high market concentration.[67] In contrast, the EU focuses on the change rather than the absolute level of HHI index to conclude whether an industry is concentrated or not. With an average HHI of 0.35, Dutch manufacturing industries proved to be highly concentrated according to the US standard. However, the same concentration ratio does not convey much information within the realms of the EU competition legislation, as the average HHI in Table 3-2 refers to the level, rather than the change in the concentration index.

[67] Legislations on industry concentration, both in the EU and US, are discussed under the theme of 'horizontal mergers' which involve the joining of firms operating in the same market.
i) Details on the issue for the US are available at (retrieved on October, 09 2013):
http://www.justice.gov/atr/public/guidelines/hmg-2010.html#5c
ii) More information on the competition legislation within the EU can be found at (retrieved on October, 09 2013): http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52004XC0205(02)&from=EN

**Table 3-2:** Descriptive statistics

| VARIABLES | Obs. | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| $ENTRY_{it}$ | 3674 | 0.077 | 0.065 | 0 | 0.667 |
| $FDI_{it}$ | 3674 | 0.173 | 0.240 | 0 | 1 |
| $HHI_{it}$ | 3674 | 0.346 | 0.270 | 0.005 | 1 |
| $lnWAGE_{it}$ | 3674 | 3.422 | 0.460 | -0.693 | 7.605 |
| $lnSIZE_{it}$ | 3674 | 7.449 | 1.602 | 0.693 | 12.809 |
| $GROWTH_{it}$ | 3674 | 0.017 | 0.391 | -0.800 | 2.504 |
| $MES_{it}$ | 3674 | 48.604 | 79.399 | 0.884 | 1191.033 |
| $CAPITAL_{it}$ | 3674 | 288.464 | 5511.940 | 0 | 324655.500 |
| $ENERGY_{it}$ | 3674 | 6.378 | 16.362 | 0 | 249.244 |
| $R\&D_{it}$ | 3674 | 0.001 | 0.007 | 0 | 0.180 |
| $ADVERTISING_{it}$ | 3674 | 0.003 | 0.007 | 0 | 0.103 |
| $AGE_{it}$ | 3674 | 39.165 | 3.312 | 25.266 | 54.344 |
| $FEMALE_{it}$ | 3674 | 0.245 | 0.144 | 0 | 0.794 |
| $SKILL_{it}$ | 3674 | 0.260 | 0.134 | 0 | 1 |
| $TRAINING_{it}$ | 3674 | 0.244 | 0.315 | 0 | 6.946 |
| $REGION_{it}$ | 3674 | 0.456 | 0.131 | 0 | 1 |

*Notes:* N=3674. The statistics are based on model 1 in Table 3-3.

## 3.5. Estimation Results

### 3.5.1. Whole Sample

We first provide evidence on the effects of FDI on the rates of domestic entry for the whole sample. Second, we consider the same effects by using a subsample which excludes single-owner businesses (i.e., ZZPs).[68] Table 3-3 shows these results. Finally, we distinguish different industries and turn to the assessment of whether entry rates in high-tech industries respond to the presence of FDI differently compared to low-tech industries. Tables 3-4 and 3-5 reveal these findings. As explained above, the three-stage least squares (3SLS) approach is used to simultaneously estimate the defined system of equations.

Table 3-3 has three panels corresponding to the three equations discussed in the methodology section. Panel A shows the estimation results for the entrepreneurship equation (Eq. 3.1) while Panel B displays the results for the concentration equation (Eq. 3.2). The results from the wage equation (Eq. 3.3) are reported in Panel C. Furthermore, the first three columns provide the findings obtained from the analysis of the whole sample (models 1 through 3), while the last three columns show the same parameters attained through the use of the subsample excluding ZZPs (models 4 through 6).

More specifically, Table 3-3 investigates the two main hypotheses (H1 and H2) developed in section 3.2, each of which was divided into two sub-hypotheses. First, we expect FDI to reduce industry concentration (H1a) which eventually encourages domestic

[68] ZZPs (zelfstandige zonder personeel in Dutch) are those people who work for themselves but do not hire any other employees.

firm formation in Dutch manufacturing industries (H1b). Second, it is postulated that wages increase in response to the FDI presence (H2a) that translates into a reduction in domestic firm entry rates (H2b). The advantage of using the 3SLS technique is that all hypotheses can be tested concurrently. Put differently, the system estimation allows for domestic entry, wage and concentration levels to be determined simultaneously while explicitly incorporating the effects of FDI on each dependent variable. Consequently, we can interpret the estimation results in Table 3-3 as follows: First, the effects of FDI presence on industry concentration and wages will be identified in Panels B and C, respectively. These associations refer to the sub-hypotheses H1a and H2a. Next, in Panel A, we investigate how these two channels are subsequently related to domestic entry rates in manufacturing industries. H1b and H2b capture the indirect FDI effects on entry rates transmitted through these channels. Finally, we also show the direct link between FDI and entrepreneurship after the effects via wages and concentration channels are taken into account.

The examination of Panels B and C, column (1) in Table 3-3, shows that FDI is significantly linked to both industry concentration and wage levels, based on the whole sample. In Panel B, column (1), the coefficient of foreign employment share is significantly positive, indicating that higher FDI is associated with a higher degree of market concentration, and lower competition. To explain, a 10% increase in the FDI presence measured as the share of foreign employment in an industry coincides with an increase of 0.371% in concentration levels. This finding is contrary to our expectations regarding sub-hypothesis H1a.

As shown in Panel C, the coefficient of FDI is positive and significant at the 5% level, suggesting that on average a larger FDI presence in Dutch manufacturing sectors coincides with higher wages. Namely, a 10% increase in the foreign employment share corresponds to an increase of 0.657% in the overall wage level. This finding is consistent with sub-hypothesis H2a.

The positive relationship between the industry FDI on the one hand, and wage and concentration levels, on the other refutes H1a, and indicates confirmation of H2a. In Panel A, column (1), we show how these positive effects of FDI are translated into domestic entry rates, and set the basis for testing the complementary sub-hypotheses; H1b and H2b. H1b postulated an inverse relationship between industry concentration and entrepreneurship subsequent to a reduction in the former ensuing FDI. However, the fact that H1a is rejected, that FDI increases concentration in Dutch manufacturing industries rather than reduces it, automatically leads to refuting hypothesis H1b. A negative link between industry concentration and domestic entry is likely as, intuitively, powerful incumbent firms are considered to exhibit aggressive strategies that deter new firm entry. However, market concentration signals higher profit margins, thereby creating more incentives for new entrants to capture some of these rents. It is therefore not surprising that previous studies display mixed effects of market concentration on entry (Geroski, 1995). In our study, the coefficient of the Herfindahl index in Panel A, column (1) is positive and significant at the 1% level for gross entry. Specifically, a 10% increase in market concentration is associated with a 0.313% increase in gross entry rates. This suggests that in Dutch manufacturing sectors higher market concentration tends to create higher rents that induce new entrants and possibly more innovative or cost-efficient firms. In their study of firm entry and exit in Dutch manufacturing industries, Kleijweg and Lever (1996) also report a positive association between industry concentration and entrepreneurship. No distinction is made, however, with regard to the sources of the changes in concentration levels, compared to this study. Overall, the positive coefficient on the HHI index in Panel A, column (1) provides evidence against sub-hypothesis H1b in this study.

**Table 3-3:** 3SLS estimation results

| | Based on the whole sample *including* ZZPs | | | Based on the subsample *excluding* ZZPs | | |
|---|---|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** | **Model 6** |
| **PANEL A: Estimates for the entrepreneurship equation** | | | | | | |
| $FDI_t$ | 0.000542 (0.006) | | | -0.00111 (0.006) | | |
| $FDI_{t-1}$ | | 0.000698 (0.006) | | | 0.000848 (0.006) | |
| $FDI_{t-2}$ | | | -0.00745 (0.006) | | | -0.00582 (0.006) |
| lnWAGE | -0.0605** (0.027) | -0.0624** (0.027) | -0.0442* (0.025) | -0.0704*** (0.025) | -0.0734*** (0.025) | -0.0561** (0.023) |
| HHI | 0.0313*** (0.011) | 0.0319*** (0.012) | 0.0298*** (0.011) | 0.0260** (0.010) | 0.0271*** (0.010) | 0.0232** (0.010) |
| GROWTH | 0.0185*** (0.003) | 0.0184*** (0.003) | 0.0132*** (0.003) | 0.0196*** (0.003) | 0.0195*** (0.003) | 0.0147*** (0.003) |
| MES | -0.0000182 (0.000) | -0.0000179 (0.000) | -0.00001 (0.000) | -0.0000430** (0.000) | -0.0000428** (0.000) | -0.0000380** (0.000) |
| CAPITAL | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| R&D | 0.0641 (0.183) | 0.0646 (0.183) | 0.0155 (0.183) | 0.115 (0.178) | 0.115 (0.178) | 0.0843 (0.178) |
| ADVERTISING | 0.141 (0.182) | 0.147 (0.182) | -0.0692 (0.191) | 0.152 (0.174) | 0.156 (0.174) | -0.0622 (0.182) |
| REGION | 0.0244** (0.010) | 0.0256** (0.010) | 0.0149 (0.010) | 0.0240** (0.010) | 0.0250*** (0.010) | 0.0146 (0.010) |
| R-squared | 0.1109 | 0.1056 | 0.1479 | 0.0896 | 0.0794 | 0.1300 |
| **PANEL B: Estimates for the concentration equation** | | | | | | |
| $FDI_t$ | 0.0371** (0.017) | | | 0.0405** (0.018) | | |
| $FDI_{t-1}$ | | 0.0490*** (0.017) | | | 0.0521*** (0.018) | |
| $FDI_{t-2}$ | | | 0.0501*** (0.018) | | | 0.0555*** (0.018) |
| lnSIZE | -0.0970*** (0.003) | -0.0973*** (0.003) | -0.0989*** (0.003) | -0.0995*** (0.003) | -0.0998*** (0.003) | -0.101*** (0.003) |
| GROWTH | 0.0116 (0.008) | 0.0121 (0.008) | 0.00773 (0.009) | 0.00899 (0.008) | 0.00933 (0.008) | 0.00470 (0.009) |
| MES | 0.000301*** (0.000) | 0.000299*** (0.000) | 0.000317*** (0.000) | 0.000218*** (0.000) | 0.000216*** (0.000) | 0.000217*** (0.000) |
| CAPITAL | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| R&D | 2.528*** (0.577) | 2.523*** (0.577) | 2.425*** (0.591) | 2.502*** (0.584) | 2.497*** (0.584) | 2.404*** (0.599) |
| ADVERTISING | -1.839*** (0.533) | -1.879*** (0.533) | -2.294*** (0.579) | -1.999*** (0.538) | -2.033*** (0.538) | -2.426*** (0.585) |
| REGION | 0.0199 (0.030) | 0.0193 (0.030) | 0.0248 (0.031) | 0.0326 (0.028) | 0.0328 (0.029) | 0.0446 (0.030) |
| R-squared | 0.5263 | 0.5260 | 0.5323 | 0.5299 | 0.5296 | 0.5366 |
| **PANEL C: Estimates for the wage equation** | | | | | | |
| $FDI_t$ | 0.0657** (0.029) | | | 0.0545* (0.029) | | |
| $FDI_{t-1}$ | | 0.0574** (0.029) | | | 0.0546* (0.029) | |
| $FDI_{t-2}$ | | | 0.101*** (0.030) | | | 0.0962*** (0.030) |
| CAPITAL | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| ENERGY | 0.00121*** (0.000) | 0.00121*** (0.000) | 0.00129*** (0.000) | 0.00128*** (0.000) | 0.00127*** (0.000) | 0.00133*** (0.000) |
| AGE | 0.0112*** (0.002) | 0.0112*** (0.002) | 0.0109*** (0.002) | 0.0118*** (0.002) | 0.0118*** (0.002) | 0.0118*** (0.002) |
| FEMALE | -0.287*** (0.067) | -0.286*** (0.067) | -0.294*** (0.071) | -0.337*** (0.066) | -0.336*** (0.066) | -0.349*** (0.070) |
| SKILL | 0.107* (0.056) | 0.107* (0.056) | 0.138** (0.060) | 0.133** (0.056) | 0.133** (0.055) | 0.172*** (0.060) |
| TRAINING | 0.0665*** (0.020) | 0.0690*** (0.020) | 0.0636*** (0.021) | 0.0669*** (0.020) | 0.0684*** (0.019) | 0.0640*** (0.020) |
| REGION | 0.0240 (0.050) | 0.0282 (0.050) | 0.0172 (0.053) | 0.0316 (0.048) | 0.0347 (0.048) | 0.0243 (0.050) |
| R-squared | 0.5491 | 0.5485 | 0.5548 | 0.5436 | 0.5431 | 0.5509 |
| Observations | 3674 | 3673 | 3422 | 3670 | 3669 | 3418 |

*Notes:* Standard errors are in parentheses. INDUSTRY and YEAR DUMMIES are suppressed to fit the table in a single page. *** p<0.01, ** p<0.05, *p<0.1

We now turn our attention to the effects of FDI-induced wage levels on gross entry, relative to sub-hypothesis H2b. Previously, we argued that higher wage rates may encourage potential entrepreneurs to join established firms, and thereby crowd-out domestic entrepreneurship. In fact, in Panel A, our argument is supported by the coefficient on the wage variable in the entrepreneurship equation. All else being equal, this coefficient suggests that a 10% increase in the wage level in an industry is associated with a 0.00605% reduction in gross entry rates. This implies that the availability of higher wages stemming from FDI presence tends to pull individuals away from self-employment in Dutch manufacturing industries, confirming sub-hypothesis H2b.

Until now, the focus has been on the indirect effects of FDI on gross entry through wages and market concentration. The entrepreneurship specification in Panel A, column (1), presents a further interesting result. Namely, the coefficient of FDI is positive but not statistically significant. This indicates that FDI presence does not play a direct role in explaining gross entry rates when its indirect effects via wage and competition channels are separated out.

To summarize, the simultaneous estimation of entrepreneurship, wage and concentration specifications by using 3SLS yields the following results:

i) Higher FDI presence is associated with an increase in industry concentration which coincides with higher levels of gross entry rates. These findings provide evidence against sub-hypotheses H1a and H1b.
ii) Industries with increased FDI presence accommodate higher wages, translating into lower gross entry rates. The sub-hypotheses H2a and H2b are therefore supported.
iii) Gross firm entry is not directly associated with FDI presence, independent of the effects via wage and concentration channels.

Robustness checks show that the last relationship is less clear than the indirect effects via wages and concentration. This can easily be explained with the opposite signs of the wage and concentration coefficients in Panel A. If FDI is positively associated with industry concentration (wages) in Panel B (Panel C), but an increase in wage and concentration levels work against each other in Panel A, it is conceivable that the residual direct effect of FDI on entrepreneurship is statistically and economically unstable and less robust.

The definitions of the FDI variable used in all three equations (Panel A, B and C) in column (1) of Table 3-3 implicitly assume an increase in FDI presence in one year would have an effect on the dependent variables in the same year. This simply implies that all adjustments occur within one year. However, it may take longer for gross entry to respond to FDI presence. To assess this aspect, we include the first and second lags of this variable into each of the three models. Estimation results from these alternative specifications, based on the whole sample, are presented in columns (2) and (3) in Table 3-3, respectively.[69]

As shown, the results obtained from the models incorporating the previous year's FDI are qualitatively similar to the coefficients reported in column (1), Table 3-3. This suggests the existence of relatively long-term indirect effects of FDI presence on gross

[69] Note that the sample size decreases by only one observation as we move from column (1) (with the contemporary FDI) to column (2) (with the one-year lagged FDI) in Table 3-3. This is because the variable GROWTH already draws on 1995 data, as does the lagged FDI variable. Hence, the sample does not shrink with the exception of one observation, where the FDI variable is missing in one NACE rev. 1.1 5-digit industry in 1996.

entry via wage and market concentration mechanisms. One might argue that the correlation between the current and lagged FDI variables is expected to be high, and persistent, and therefore the indirect effects of the lagged FDI could simply be a manifestation of this mechanism instead of timing effects. To account for this concern, we added contemporary and the previous year's FDI in the same model. The coefficients obtained from this alternative model (not reported) remain qualitatively unchanged to those reported in columns (1) through (3), Table 3-3.

As we move from column (1) to column (3) in Table 3-3, we see that control variables perform in line with our expectations with few exceptions. The signs and significance levels of the coefficients on the control variables are relatively consistent across the columns. This holds true for each of the three equations that are estimated simultaneously. To begin with, in Panel A, the coefficients on industry growth are positive and statistically significant at the 1% level indicating that, all else being equal, growing industries experience higher entry rates. Furthermore, the control variables minimum efficient scale, R&D intensity, advertising intensity and capital-labour ratio carry insignificant coefficients, substantiating their limited role in explaining the differential rates of gross entry. Finally, the variable REGION is positively associated with entry rates, suggesting the presence of spatial effects on gross entry.

Regarding the effects of the control variables in concentration and wage equations, we see these are largely consistent with the literature discussed previously. Looking at the concentration specification in Panel B, a number of control variables emerge as statistically significant. First, industry size is negatively related to industry concentration. This result supports the intuitive notion that larger industries can accommodate more firms, and thereby have lower levels of market concentration. Furthermore, higher minimum efficient scale and R&D intensity, which seem to act as entry barriers to new entrants, coincide with an increase in concentration levels. The coefficients on industry growth and capital intensity enter statistically insignificant in the regressions as predictors of market concentration.

The coefficient for ADVERTISING is negative and significant at the 1% level. This result is in line with Blomström (1986), who analysed the determinants of market concentration in Mexican manufacturing industries and found a negative relationship between advertising intensity and concentration. The author argues that the mix of sub-industries with high and low grade goods determines the type and aggressiveness of advertising, also the direction of the relationship between advertising and market concentration. Such a mechanism may explain the negative coefficients on ADVERTISING in Panel B, Table 3-3. In fact, the coefficients of ADVERTISING in the sub-samples of high- and low-tech manufacturing industries conform to those of Blomström (1986).[70]

In Panel C, we see that female employees on average earn less than their male counterparts, a prediction that is empirically well-supported. Furthermore, the coefficients on the variables AGE, SKILL and TRAINING suggest that older, highly-skilled and trained employees receive higher wages. All these results are in accordance with expectations. Energy use per worker, employed as a proxy for labour productivity, is positively related to wage levels indicating that employees with higher productivity receive higher wages.

[70] In the analysis where we distinguish between high- and low-tech industries (relevant results are discussed in the next subsection), the coefficient on ADVERTISING loses its significance in the former group whereas the same variable is still negatively linked to market concentration in low-tech industries. Our results are consistent with those reported in Blomström (1986) to the extent that the industries producing high-grade and traditional goods, as defined by the author, are comparable with high- and low-tech industries in our analysis.

Differences in capital-labour ratios, however, do not seem to be able to explain wage differentials in Dutch manufacturing industries.

### 3.5.2. Subsample: Excluding ZZPs

We now focus our attention on the estimation results obtained from the subsample excluding single-owner businesses (i.e., ZZPs). Since such firms account for the majority of businesses in the dataset, it is worthwhile to check whether our previous results are driven by the presence of these firms. Estimates derived from this subsample are displayed in the last three columns in Table 3-3. The results are presented in the same manner as above. A quick look at columns (4) through (6) suggests that the results are, by and large, in agreement with those obtained from the analysis of the whole sample.[71] Hence, our findings could apply to Dutch manufacturers irrespective of ZZPs.

### 3.5.3. Subsamples: High-tech and Low-tech Industries

The above analysis assumes homogeneity of manufacturing industries. However, industries with different underlying structures may have particular sensitivities to the FDI presence. Due to the differences in, for example, the innovation capacity, or the sources and directions of technical change, FDI effects may not be uniformly distributed across industries. This predominantly applies to the differentiation between high- and low-tech sectors. We therefore test separately whether FDI plays a different role in the high- and low-tech Dutch manufacturing industries.[72] The estimation results are presented in Tables 3-4 and 3-5. While the coefficients in Table 3-4 are based on the whole sample, Table 3-5 reports subsample results excluding single-owner businesses. We suppress estimates for the control variables as they behave qualitatively alike to those in Table 3-3.

Comparing the results across high- and low-tech industries, we find that none of the models in Panel A, in Tables 3-4 and 3-5, resulted in different FDI estimates than those derived from the sample without the categorization of industries. This suggests that the industry division into high- vs. low-tech plays no essential role in explaining missing direct effects of FDI on domestic entry. On the other hand, although the coefficients on FDI are insignificant in conventional terms (at the 5% level), their signs are persistently different across high- and low-tech industries; being positive for the former and negative for the latter. An explanation may be that the domestic innovative and absorptive capacities in the knowledge intensive industries are (more) complementary to new technologies and know-how of foreign firms. This compatibility may provide sufficient incentives for entrepreneurs to enter high-tech industries and seemingly compensate for the negative consequences of FDI that may be more pertinent to low-tech industries, where increased FDI may substitute for domestic assets and entry of local firms.

With the exception of the missing direct effects of FDI on gross entry, we detect important differences between the coefficient estimates across high- vs. low-tech industries in Tables 3-4 and 3-5. We find that the results of the whole sample (Table 3-3) are primarily driven by low-tech industries (columns (4) through (6) in Tables 3-4 and 3-5), which do not only constitute the larger subsample, but also show more significant effects that corroborate the overall results in Table 3-3. Therefore, we will continue the discussion by exploring the extent to which the results obtained from the high-tech subsamples diverge from the rest. First, in columns (1) through (3) in Panel A, Table 3-4, where single-

[71] The only exception is the coefficient on MES in Panel A which enters negatively significant in the entrepreneurship regression at the 5% level.

[72] The industry breakdown is based on the classification used by the Eurostat. See Table 3-A-2 in the appendix for the list of industries categorized by technological intensity.

owner firms are kept, wage and concentration levels are no longer significantly related to gross entry rates. However, in the case where single-owner businesses are excluded (columns (1) and (2) in Panel A, Table 3-5), the replication of the same estimation yields coefficients on wages and concentration ratio that are again statistically different from zero, in accordance with the estimates without industry splitting (Panel A, Table 3-3) and low-tech industries (columns (4) and (5) in Panel A, Tables 3-4 and 3-5). This suggests that the inclusion and exclusion of the single-owner businesses into the sample have important implications on the estimates derived from high-tech industries. Furthermore, the positive association between FDI and market concentration disappears in high-tech sectors, and even becomes negatively significant in column (1) in Panel B, Table 3-4.

**Table 3-4:** 3SLS estimation results: High- vs. low-tech industries, *including* ZZPs

Based on the whole sample *including* ZZPs

| | **High-tech Industries** | | | **Low-tech Industries** | | |
|---|---|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** | **Model 6** |
| **PANEL A: Estimates for the entrepreneurship equation** | | | | | | |
| $FDI_t$ | 0.00996 (0.011) | | | -0.00521 (0.007) | | |
| $FDI_{t-1}$ | | 0.00768 (0.010) | | | -0.00361 (0.007) | |
| $FDI_{t-2}$ | | | 0.00180 (0.010) | | | -0.0104 (0.008) |
| lnWAGE | -0.0413 (0.041) | -0.0397 (0.038) | -0.0252 (0.036) | -0.0518* (0.028) | -0.0561** (0.028) | -0.0451 (0.028) |
| HHI | 0.0280 (0.019) | 0.0287 (0.019) | 0.0178 (0.017) | 0.0292** (0.014) | 0.0302** (0.014) | 0.0311** (0.014) |
| R-squared | 0.2280 | 0.2304 | 0.2478 | 0.1171 | 0.1074 | 0.1333 |
| **PANEL B: Estimates for the concentration equation** | | | | | | |
| $FDI_t$ | -0.0871** (0.036) | | | 0.0704*** (0.020) | | |
| $FDI_{t-1}$ | | -0.0341 (0.037) | | | 0.0704*** (0.020) | |
| $FDI_{t-2}$ | | | -0.0190 (0.040) | | | 0.0683*** (0.021) |
| R-squared | 0.4857 | 0.4832 | 0.4851 | 0.5421 | 0.5412 | 0.5473 |
| **PANEL C: Estimates for the wage equation** | | | | | | |
| $FDI_t$ | 0.0734 (0.055) | | | 0.0220 (0.034) | | |
| $FDI_{t-1}$ | | -0.0116 (0.057) | | | 0.0406 (0.034) | |
| $FDI_{t-2}$ | | | 0.0308 (0.061) | | | 0.0893** (0.035) |
| R-squared | 0.6198 | 0.6191 | 0.6282 | 0.5186 | 0.5182 | 0.5231 |
| Observations | 1035 | 1035 | 963 | 2639 | 2638 | 2459 |

*Notes:* Standard errors are in parentheses. All control variables are suppressed. *** p<0.01, ** p<0.05, *p<0.1

Finally, the estimations in Tables 3-4 and 3-5 show that, in contrast to our earlier results (Table 3-3), the effects of FDI presence on wage rates are statistically insignificant irrespective of the industry type, when one year-lagged FDI is used. This, however, changes when we use lagged FDI that accounts for longer-term effects. Once the FDI variable is lagged by two (columns (6) in Panel C, Table 3-4 and 3-5) or more years, then higher values of FDI are significantly associated with higher wage rates in low-tech industries, but not in high-tech sectors. This consistently applies to lags as far back as five years and also when we incorporate all FDI lags at once.[73]

[73] Any of the results mentioned but not represented are available on request.

**Table 3-5:** 3SLS estimation results: High- vs. low-tech industries, *excluding* ZZPs

Based on the subsample *excluding* ZZPs

| | **High-tech Industries** | | | **Low-tech Industries** | | |
|---|---|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** | **Model 6** |
| **PANEL A: Estimates for the entrepreneurship equation** | | | | | | |
| $FDI_t$ | 0.00378 (0.011) | | | -0.00453 (0.007) | | |
| $FDI_{t-1}$ | | 0.00412 (0.011) | | | -0.00210 (0.007) | |
| $FDI_{t-2}$ | | | 0.000324 (0.011) | | | -0.00799 (0.007) |
| lnWAGE | -0.0797*(0.044) | -0.0792* (0.041) | -0.0724* (0.038) | -0.0597** (0.026) | -0.0641** (0.026) | -0.0509** (0.026) |
| HHI | 0.0311* (0.017) | 0.0338** (0.017) | 0.0259 (0.016) | 0.0212* (0.013) | 0.0222* (0.013) | 0.0205 (0.013) |
| R-squared | 0.0662 | 0.0671 | 0.0968 | 0.1190 | 0.1073 | 0.1406 |
| **PANEL B: Estimates for the concentration equation** | | | | | | |
| $FDI_t$ | -0.0342 (0.036) | | | 0.0619*** (0.020) | | |
| $FDI_{t-1}$ | | 0.00661 (0.037) | | | 0.0655*** (0.020) | |
| $FDI_{t-2}$ | | | 0.0352 (0.040) | | | 0.0634*** (0.021) |
| R-squared | 0.4920 | 0.4915 | 0.4948 | 0.5434 | 0.5427 | 0.5493 |
| **PANEL C: Estimates for the wage equation** | | | | | | |
| $FDI_t$ | 0.0705 (0.055) | | | 0.00867 (0.034) | | |
| $FDI_{t-1}$ | | -0.0150 (0.057) | | | 0.0378 (0.034) | |
| $FDI_{t-2}$ | | | 0.0277 (0.061) | | | 0.0843** (0.035) |
| R-squared | 0.6117 | 0.6111 | 0.6225 | 0.5135 | 0.5131 | 0.5193 |
| Observations | 1034 | 1034 | 962 | 2636 | 2635 | 2456 |

*Notes:* Standard errors are in parentheses. All control variables are suppressed. *** p<0.01, ** p<0.05, *p<0.1

### 3.5.4. Economic Significance

In this subsection, we discuss the economic significance of our estimates. Specifically, Table 3-6 displays the size effects of a subset of the models included in Tables 3-3, 3-4 and 3-5. The economic effects are calculated as the percentage change in the dependent variable with respect to a 10% increase in the relevant independent variables.

The economic effects in column (1) in Table 3-6 are based on model (1) in Table 3-3. We see that the size of the FDI effect on market concentration is small. A 10% increase in FDI coincides with an increase in market concentration of only 0.371%. The effect of FDI on wages is economically larger. A 10% increase in FDI is associated with an increase of 0.657% in industry wages. The channel effects of wages and market concentration on entrepreneurship, however, are both small. A 10% increase in industry wages translates into a decrease of entrepreneurship of 0.00605%. For market concentration, an increase of 10% translates into an increase of entrepreneurship of 0.313%. A very similar picture emerges when considering the economic effects presented in the subsequent columns in Table 3-6.

In summary, the economic effects of FDI on wages are the largest among the significant relationships depicted in Table 3-6. The effects of wages on entrepreneurship are much smaller, which diminishes the power of this channel. Additionally, these reduced effects of wages on gross entry rates are neutralized by the counter-effect of the second channel, market concentration. In other words, although the indirect effect of FDI on entrepreneurship through the wage channel might initially appear troublesome, the effect:

i) is substantially weakened on its way through the channel, and ii) is offset by the counter-effects between FDI, market concentration and entrepreneurship.

**Table 3-6:** Economic significance

| | **Table 3-3 Model 1** | **Table 3-3 Model 2** | **Table 3-3 Model 4** | **Table 3-3 Model 5** | **Table 3-4 Model 4** | **Table 3-5 Model 4** |
|---|---|---|---|---|---|---|
| **Panel A: Entrepreneurship equation** | | | | | | |
| $FDI_t$ effects on ENTRY | *not sig.* | *not sig.* | *not sig.* | *not sig.* | *not sig.* | *not sig.* |
| $FDI_{t-1}$ effects on ENTRY | *not sig.* | *not sig.* | *not sig.* | *not sig.* | *not sig.* | *not sig.* |
| lnWAGE effects on ENTRY | -0.00605 | -0.00624 | -0.00704 | -0.00734 | -0.00518 | -0.00597 |
| HHI effects on ENTRY | 0.313 | 0.319 | 0.260 | 0.271 | 0.292 | 0.212 |
| **Panel B: Concentration equation** | | | | | | |
| $FDI_t$ effects on HHI | 0.371 | | 0.405 | | 0.704 | 0.619 |
| $FDI_{t-1}$ effects on HHI | | 0.490 | | 0.521 | | |
| **Panel C: Wage equation** | | | | | | |
| $FDI_t$ effects on lnWAGE | 0.657 | | 0.545 | | *not sig.* | *not sig.* |
| $FDI_{t-1}$ effects on lnWAGE | | 0.574 | | 0.546 | | |

*Notes:* Economic significance is calculated as the percentage change in the dependent variable with respect to a 10% increase in the relevant independent variable.

### 3.5.5. Robustness Analyses

To check for robustness, we estimated different specifications based on alternative measures of the most important variables and altered the industry aggregation level. First, we replicated the analysis by substituting gross entry rates with net entry as the dependent variable in the entrepreneurship model. This measure of firm entry, however, does not make a distinction between gross entry and exits in an industry. Consequently, to some extent, net entry can deviate from gross entry rate, and the size of the discrepancy between the two variables is determined by the level of firm exit. Nonetheless, the coefficients from these alternative models corroborate those achieved earlier. They exhibit the same signs with comparable levels of statistical significance.

Second, the variables FDI, SIZE, GROWTH and MES are recomputed based on industry turnover rather than employment. The results still remain qualitatively unchanged. Third, although it is a common practice to use market shares in the computation of the Herfindahl index, employment shares can also serve as an acceptable alternative in the case of data limitation. As turnover data is less frequent than employment data, we conduct the analysis with a recomputed Herfindahl index based on employment shares. Again, the results do not deviate notably from those reported. Finally, we estimated our models at the 4-digit NACE level instead of the 5-digit industry level. Again, the results remain qualitatively unchanged.

### 3.5.6. Limitations

The results of this study should be interpreted in the context of potential limitations. The first is related to the direction of causality. With its current version, the 3SLS estimation treats the industry concentration and wages as endogenous variables to the system of equations as their levels are determined simultaneously. All other variables, including FDI,

are assumed to be exogenous, and act as instruments. However, there are concerns that the industry's FDI might be an endogenous measure in equations (3.1) through (3.3). The reasons why this might be the case in the entrepreneurship specification are discussed in detail in the previous chapter. Therefore, we do not elaborate on this issue here.

Similarly, the direction of causality between foreign firm presence and industry concentration reflects an ongoing debate, and the results of the empirical work in the field are inconclusive. On the one hand, FDI may be attracted into sectors where market concentration is high as this provides increased profit opportunities. On the other hand, the level of industry concentration tends to escalate following large scale foreign entry. Given this possibility, the observed positive relationship between the Herfindahl index and FDI should be viewed as an indicator of correlation, rather than causality.

Likewise, it is conceivable that foreign investors 'cherry pick' the best performing target firms, which, for example, already employ high quality labour and pay higher wages than the average domestic firm. Neglecting this 'cherry picking' implies that the extent of wage premiums offered by foreign-owned enterprises may be overestimated. A few studies (e.g., Almeida, 2007; Heyman et al., 2007) use matched employer-employee data to address this issue. The results in both papers show that wage premiums, although existent, are lower than previously thought. The data in this study, however, does not allow for such a matching procedure. As such, the results on FDI and wages reported in the present work must be interpreted with care. Nonetheless, the fact that we also use the first and second lag values of the FDI measure in the regressions, to some extent, mitigates this endogeneity bias.

The second limitation is that the FDI variable used in this study only applies to 'large' companies with a turnover of at least €22.69 million. Fortunately, the vast majority of FDI takes place through and into companies of this size. Nonetheless, it is important to keep in mind that the FDI effects on new business creation reported in this work pertain to foreign investments in relatively large companies.

## 3.6. Conclusions

This study has empirically examined the link between FDI and the gross entry rates of Dutch firms in manufacturing industries. As this association is multifaceted, we have considered two possible channels of transmission: the effects on domestic entry rates of FDI-induced wages and concentration levels.

Specifically, we postulated two main hypotheses, each of which is composed of two sub-hypotheses. First, we argued that, in the Netherlands as a developed economy, FDI reduces concentration levels in the industries it targets which eventually encourages domestic firm entry in the same sectors. The reasoning is that the majority of FDI inflows take place between developed nations mirroring the source countries of FDI in the Netherlands. This implies that technological proximity between domestic and foreign firms is high which enables the former group to compete successfully with the latter. Furthermore, when foreign enterprises penetrate the Dutch market, they are less likely to engage in predatory activities to discourage new firm entry. In developed nations, there are vigorously enforced antitrust laws which restrict collusive strategies by incumbent firms and help to preserve a competitive market environment. Likewise, the liability of foreignness—the challenges that foreign firms face in host countries owing to a lack of understanding of local conditions—may prevent foreign firms from implementing strategic behaviours which would otherwise exacerbate industry concentration.

The results, however, provide evidence against the first hypothesis. In the analysis, higher levels of FDI coincide with higher market concentration which is positively related to entrepreneurial activity. This unexpected finding may partly be explained by the argument put forward by Blomström (1986) although his perspective lies within a developing country context. The author argues that one of the main motivations behind entering foreign markets is to earn above-normal profits, and therefore foreign firms are mainly attracted to concentrated industries providing such opportunities. Upon entry, foreign firms exacerbate existing market concentration by further increasing the minimum efficient scale, inhibiting new firm formation. While this perspective is useful in justifying the positive relationship between FDI and concentration levels in Dutch manufacturing industries, it fails to explain why high concentration eventually encourages domestic firm entry. In a developed country, domestic firms, both the existing and potential entrants, are not sharply distinct from their foreign counterparts with regard to technological and organizational capabilities. Our results suggest that, upon the recognition of above-normal profit opportunities in concentrated markets, new Dutch firms appear to bypass entry barriers imposed by foreign firms, for example, owing to technological compatibility. Empirical support for this line of reasoning is reported in Kleijweg and Lever (1996) where industries with high concentration are found to attract more new firms in Dutch manufacturing industries.

Our second hypothesis predicts that industries with larger FDI presence have higher wages which eventually inhibit entrepreneurship in these sectors. The rationale is that average industry wages in host countries are generally an increasing function of industry FDI. This can be achieved through several mechanisms. First, foreign firms can contribute to domestic human capital formation by training employees in new technology and through job experience. Equipped with the new knowledge and skills, employees moving to local firms can increase productivity levels which reflect in higher wages. Second, there will be an increase in the demand for labour subsequent to FDI, translating into a rise in wage levels. Finally, foreign firms normally pay higher wages than domestic firms for employees with the same qualifications. Wage premiums paid by foreign firms in combination with positive wage spillovers to domestic firms entail higher overall wages in host countries. The availability of higher wages, however, increases the opportunity cost of entrepreneurship. Attracted by higher wages, talented individuals may self-select into wage-employment due to the uncertainty surrounding the entrepreneurial income. Our analysis conforms to the second hypothesis that FDI puts upward pressure on wage levels, which lowers the gross entry rates in Dutch manufacturing industries.

Besides the two main hypotheses, our results offer additional empirical evidence. Once the indirect effects of FDI through concentration and wage channels were accounted for, the direct effect of FDI on entrepreneurship becomes insignificant. This applies to short- as well as relatively long-term effects of FDI. All findings are robust to the exclusion of single-owner businesses although such firms make up a larger share of the dataset.

The results also suggest that there are notable differences between gross entry into high- and low-tech industries, especially if we include FDI that is lagged by more than one year. Domestic firm entry into low-tech industries is negatively associated with wage increases. Also, the FDI-induced market concentration is linked to entry into low-tech industries. Neither of these relationships is detected in high-tech industries. Accordingly, a split into high- and low-tech industries reveals that the main results of this study are primarily driven by FDI effects in the latter group of industries.

Although an individual country study of the Netherlands does not easily lend itself to generalization, we believe that the findings of this work are relevant for other countries, particularly EU nations. The EU aims at a high degree of harmonization in many fields including FDI and entrepreneurship policies across its member states. This suggests that member countries tend to become more alike rather than divergent over time. Furthermore, older members, such as the Netherlands, act as successful exemplars for their newly-joined East European peers in achieving economic progress. Consequently, we believe that the empirical evidence in this study, despite focusing on a single country, provides valuable insights into the role of FDI in shaping the entrepreneurial landscape of host countries, and may be cautiously applied in other country settings.

Our results have specific policy implications. First, there is a trade-off between the two channels, wages and concentration, which transmit the indirect effects of FDI on domestic entrepreneurship in opposite directions. As these effects largely neutralize each other there is no immediate concern, although specific policies aimed at FDI and the labour market, and at FDI and local competition may be able to curb the negative wage channel and support the positive competition channel. With regard to new firm creation via the latter channel, our results show that more concentrated markets attract more domestic entrepreneurship, possibly because of the higher rents that can be gained in these markets. FDI does not seem to be able to build up market barriers against domestic firm entry. Thus, even though a positive relationship between FDI and market concentration may be of concern for competition policy, it appears that the lucrative rents in these markets are available to both foreign and domestic firms.

The second point concerns the labour policy implications of our study. The results suggest that FDI is positively linked to wages; a prediction that finds support in the literature. Moreover, higher wages deter entry into entrepreneurship by luring talents into wage-employment. This is of interest for regulators, who might want to adopt policies that offset the adverse effects of FDI on entrepreneurship via the channel of higher wages. However, this requires a careful balancing act as it remains unclear whether the added welfare of higher wages for entrepreneurs, who choose for wage-employment in a foreign-owned firm is smaller than the welfare that this potential entrepreneur would have added in firm creation (bankruptcy is a serious possibility). If a promising young entrepreneur chooses a well-paid career in a technologically advanced foreign firm, this move may open up welfare enhancing opportunities within the same firm through intrapreneurship. In fact, in a developed country context, entrepreneurial and intrapreneurial activities can be, at least in part, regarded as substitutes for each other from a welfare perspective. Hence, for the implications in the field of labour policy (in conjunction with FDI policy), the crucial aspects that need attention are the quality of entrepreneurial talent that is attracted to foreign-owned wage-employment and the quality of entrepreneurs that, despite higher wages, decides to start their own company.

Finally, our work suggests that aggregate results are largely driven by low-tech industries, and that much of the significant effects disappear when the focus is on high-tech sectors. This means that the policies discussed above are particularly important for low-tech sectors.

Overall, our study shows that FDI can at the same time be a threat and an opportunity for new business creation in manufacturing, depending on the channel and sector, and whether policy-makers succeed in making full use of the advantages FDI provides while limiting its downsides.

## 3.7. Future Research Opportunities

Developing countries are becoming increasingly important as both recipients and sources of FDI inflows. Owing to the recent economic crisis, FDI to advanced economies fluctuates with a downward trend, and this is followed by an increase in the attractiveness of developing countries as investment destinations. Consequently, it comes as no surprise that in 2012, the share of world FDI inflows to these countries exceeded inflows to developed nations. Given that overall industry structure and labour markets manifest sharp differences across developing and developed countries with the former enjoying a boom in FDI inflows it would be interesting to replicate the present study in a developing country context.

Second, a future research opportunity is envisioned in relation to taking the heterogeneity in FDI source countries into account. Specifically, the current study depicts the North-North case with regard to the direction of FDI as the lion's share of inflows into the Netherlands originates from advanced countries. In contrast, developing countries attract foreign investment both from advanced and developing economies, meaning that South-South FDI inflows have recently grown in importance. For instance, China receives sizable FDI from Asia's newly developing countries. Likewise, China and South Africa are now major investors in Africa. Chinese FDI in Latin America shows much faster growth than global FDI in the region. Hence, a comparative study may be conducted to find out whether FDI from advanced countries bears different implications on entrepreneurship through concentration and wage channels relative to FDI from developing countries. If the host country is a developing one, we should expect technological proximity to be high with the latter group, and low with the former which potentially determine the scope of FDI effects.

## 3.8. Appendices

**Table 3-A-1:** Variables: Descriptions and data sources

| VARIABLES | MEASURE | DESCRIPTION | SOURCE |
|---|---|---|---|
| $ENTRY_{it}$ | Gross domestic entry rate | The number of new domestic firms entered industry *i* at time *t* divided by the total number of firms in the same industry and year. | Business Register |
| $FDI_{it}$ | Foreign firm presence | The number of employees in foreign firms in industry *i* at time *t* weighted by firms' foreign equity participation divided by total employment in the same industry and year. | SFGO |
| $HHI_{it}$ | Herfindahl index | The sum of the squares of the market shares of all the firms in industry *i* at time *t.* | Production Statistics |
| $lnWAGE_{it}$ | Wage rates | The logarithm of the total industry wage bill divided by total employment in industry *i* at time *t.* | Production Statistics |
| $lnSIZE_{it}$ | Industry size | The logarithm of the total number of employees in industry *i* at time *t.* | Business Register |
| $GROWTH_{it}$ | Industry annual growth | Industry annual employment growth rate. | Business Register |
| $MES_{it}$ | Minimum efficient scale | Average firm size, defined as the total employment in industry *i* at time *t* divided by the total number of firms in the same industry and year. | Business Register |
| $CAPITAL_{it}$ | Capital-labour ratio | Industry capital stock divided by total employment in industry *i* at time *t.* | SFGO, SFKO, Business Register |
| $ENERGY_{it}$ | Energy use per employee | Total energy costs divided by total employment in industry *i* at time *t.* | Production Statistics, Business Register |
| $R\&D_{it}$ | R&D intensity | Total R&D expenditures divided by total sales in industry *i* at time *t.* | Production Statistics |
| $ADVERTISING_{it}$ | Advertising intensity | Total advertising expenditures divided by total sales in industry *i* at time *t.* | Production Statistics |
| $AGE_{it}$ | Average age | The average age of the workforce in industry *i* at time *t.* | GBA |
| $FEMALE_{it}$ | Proportion of female employees | The proportion of female employees in industry *i* at time *t.* | GBA |
| $TRAINING_{it}$ | Training costs per employee | Total training costs divided by total employment in industry *i* at time *t.* | Production Statistics, Business Register |
| $SKILL_{it}$ | Skill composition | The proportion of highly-skilled employees who have a college education in industry *i* at time *t*[74] | Educational Level |
| $REGION_{it}$ | Proportion of firms in certain regions | The proportion of firms in industry *i* at tine *t* that are located in North Holland, South Holland and North Brabant. | Business Register |

[74] The International Standard Classification of Education (ISCED) forms the basis of the variable $SKILL_{it}$. The employees with the educational level 5 or 6 based on the ISCED codes are considered as highly-skilled. Programmes at the ISCED level 5 include, among others, (higher) technical education, community college education, technician or advanced/higher vocational training, associate degree. Likewise, programmes at the ISCED level 6 cover, for example, bachelor's degree, license, or first university cycle.

**Table 3-A-2:** Manufacturing industries according to technological intensity

| HIGH-TECH INDUSTRIES | NACE rev. 1.1 2-digit industry code |
|---|---|
| Manufacture of chemicals and chemical product | 24 |
| Manufacture of machinery and equipment n.e.c | 29 |
| Manufacture of office machinery and computers | 30 |
| Manufacture of electrical machinery and apparatus n.e.c | 31 |
| Manufacture of radio, television and communication equipment and apparatus | 32 |
| Manufacture of medical, precision and optical instruments, watches and clocks | 33 |
| Manufacture of motor vehicles, trailers and semi-trailers | 34 |
| Manufacture of other transport equipment (excluding building and repairing of ships and boats) | 35 (excluding 35.1) |
| **LOW-TECH INDUSTRIES** | |
| Manufacture of food products, beverages and tobacco; textiles and textile products; leather and leather products; wood and wood products; pulp, paper and paper products, publishing and printing | 15 to 22 |
| Manufacture of coke, refined petroleum products and nuclear fuel | 23 |
| Manufacture of rubber and plastic products; basic metals and fabricated metal products; other non-metallic mineral products | 25 to 28 |
| Building and repairing of ships and boats | 35.1 |
| Manufacturing n.e.c. | 36 to 37 |

*Source:* Eurostat

# Chapter 4 : Intra- and Inter-Industry Linkages as Determinants of Entrepreneurship: Evidence from Turkey

## 4.1. Introduction[75]

Since Hirschman (1958) introduced the concept of backward and forward linkages referring to the input-output relationships in an economy, an extensive literature has emerged and progressed along three main paths. One line of research focuses on exploring what constitutes linkages, their characteristics and measurement methods (see, Barrios et al., 2011; Cella, 1984; Dietzenbacher, 1992; Dietzenbacher and Van Der Linden, 1997; Jones, 1976). While the second branch deals with the determinants of inter-firm linkages from various angles such as the strategy of make-or-buy decisions,[76] production technologies of potential suppliers and local content requirements[77] imposed by host countries (see, Belderbos et al., 2001; Giroud and Scott-Kennel, 2009; Kiyota et al., 2008; Lall, 1980), a third stream of research examines their effects on firm-level performance, such as productivity as well as on industrialization and economic restructuring (see, Javorcik, 2004; Laumas, 1975; Sonis et al., 1995; Venables, 1996).

As put forward by Meyer (2004), research efforts have been criticized for focusing disproportionately on the conceptualization of vertical linkages and factors affecting their creation to the neglect of their consequences. Offsetting this, one promising direction of research was outlined in Markusen and Venables (1999) who show from a theoretical perspective that vertical linkages (specifically backward ones) between foreign firms and domestic suppliers may encourage the formation and growth of domestic firms in the same and linked sectors in the host country. Our work is set to empirically test the predictions of this model in a developing country context. To our best knowledge, a study from this perspective has not previously been pursued. Turkey is the country we focus on.

Hirschman (1958) has already recognized that the shortage or surplus of some goods in one industry may stimulate entrepreneurs to start up new firms in other industries through backward and forward linkages, although his main emphasis was on linkages solely created between domestic firms, excluding foreign ones. Markusen and Venables (1999) were the first to introduce such a distinction prompted by the fact that foreign firms are superior to domestic ones on several fronts, such as technological intensity, organizational capabilities, higher productivity and multi-market presence (Caves, 1996; Görg and Greenaway, 2004; Lipsey and Sjöholm, 2005), which render linkages between foreign and domestic firms superior to those formed exclusively between domestic ones. What Hirschman (1958), and Markusen and Venables (1999) share is that the effects of backward and forward linkages on entrepreneurship can be considered as a circular process of economic activity. Namely, new firms are established in areas where there are a relatively high number of supplier firms (backward linkages) with good access to markets

[75] We appreciate helpful comments from seminars participants at the London School of Economics and Ege University.

[76] A make-or-buy decision refers to the question of whether firms should choose in-house production of intermediate goods and services or outsourcing.

[77] Belderbos and Sleuwaegen (1997) define local content requirement as the obligation of firms active in a country to purchase a pre-set amount of intermediate inputs from domestic suppliers for the purpose of adding value to the local economy.

(forward linkages). In turn, locations where more firms are created enlarge the market and supply access of other new firms.

A distinctive feature of the Markusen and Venables (1999) model is that foreign firms—owing to their advanced technology and organizational know-how—exert competitive pressures on domestic counterparts through horizontal linkages which result in a loss of their market shares and eventual exit. Hence, domestic entrepreneurship is both inhibited and encouraged simultaneously through horizontal and vertical linkages with foreign firms. With a focus on Turkey, addressing these relationships is the main purpose of this study.

To this end, we utilize firm-level panel data that is aggregated to the 2-digit NACE rev. 1.1 industry level. Our sample size includes 49 manufacturing and service industries over the period 2006-2008 (with a one-year lag structure).The dataset provides a good coverage of Turkish firms whose output account for approximately 75% of total production each year. Finally, we use the input-output (IO) table of 2002 (the most recent one available), to compute the indexes of backward and forward linkages between foreign and domestic firms.

Our results do not match with the conclusions deduced from the model of Markusen and Venables (1999). We reveal that while FDI seems not to affect domestic entrepreneurship through horizontal and backward linkages, industries with large forward linkages with foreign firms have more domestic entry. We also discover that the effect of forward linkages is larger in manufacturing industries compared to service sectors.

The literature on the determinants of entrepreneurship is vast hence we have selected two studies which are closely related to our work. First, Ayyagari and Kosová (2010) tested for the effects of foreign presence on domestic entry via both vertical and horizontal linkages, and found a positive impact through both channels in Czech Republic, with the former being stronger than the latter. Görg and Strobl (2002) follow a similar approach, and detect a positive effect of FDI on domestic entry in Ireland. Furthermore, the negative effect of competition—as described by Markusen and Venables (1999)—ensuing foreign presence is found to play no role in this process.

Our study extends these papers in four ways. First, the analysis is conducted in a developing country context rather than a developed one where the existence of inter-industry linkages with foreign firms is viewed as particularly important, which may serve as catalysts for industrial development (Navaretti and Venables, 2004). Second, we exploit data from both the manufacturing and service sectors. Third, Görg and Strobl (2002) fail to distinguish between backward and forward linkages whereas we explicitly consider the impact of the latter on domestic entry. Fourth, Ayyagari and Kosová (2010) focus on the time period 1994-2000 which contains the transition phase from a centrally planned economy to a market-oriented one. Accordingly, their findings may not be representative of FDI effects in the later years of the reform. Likewise, Ireland, the subject country of Görg and Strobl (2002), is used as an export platform by foreign firms to the EU which may impede interactions with the local economy. In contrast, the assessment of the effect of domestic market-oriented FDI, as in Turkey, offers a more appropriate setting since foreign and domestic firms are in direct competition with each other in meeting local demand.

The remainder of the paper is structured as follows. Section 4.2 starts with a discussion on the conceptualization of linkages from various perspectives. We also elaborate on the literature addressing the implications of linkages with foreign firms on domestic ones with a particular focus on entrepreneurship which leads to developing our hypotheses for the Turkish case. Section 4.3 describes the data and our empirical

methodology, while section 4.4 presents the results. Finally, section 4.5 concludes this chapter.

## 4.2. Framing Linkages

From an economics perspective, the concept of linkages goes back to the work of Hirschman (1958) who introduced backward and forward linkages reflecting production interdependence between industries. Lall (1980, p: 204) offered a more precise description, and defined *linkages* as "the direct relationships established by firms in complementary activities which are external to 'pure' market transactions (i.e., anonymous buyers and sellers exchanging goods in discrete transactions at prices determined in competitive markets)." Specifically, backward linkages reflect the demand-side connections between firms, and involve the procurement of inputs. Forward linkages correspond to the supply-side interdependence, and involve the sale of intermediate inputs. Hirschman linkages take place in response to price changes—when an increase in demand (or supply) of one input elevates (or lowers) its price to the extent that more firms find it profitable to enter the market and reach a minimum efficient scale. In perfectly competitive markets with complete foresight, all information regarding buying from and selling to each other is exchanged without any transaction cost. Therefore, firms no longer need to form continuing linkages with each other. Put it differently, for vertical industry linkages to be established, industries should be characterized by imperfect competition with increasing returns to scale.

Hirschman (1958) advocated a focus on a relatively small number of industries, so-called key industries, which have maximum vertical linkages with the rest of the economy. The underlying assumption is that industrial development is fuelled by key industries that accelerate and amplify initially small changes, which would eventually affect the whole economy. Furthermore, industries serving final demand should be set up first because the required input results in a broadening of economic activity through backward linkages. Technology transfer between vertically-related firms has not been explicitly addressed in this framework. Hirschman's inward looking development strategy centred on linkages guided various developing countries during the import-substitution era (Bruton, 1998).

While Hirschman's prescriptions for economic development have waxed and waned in popularity since the 1950s, the use of industrial linkages to explore the production structure and interdependency of the economy has improved and expanded over the intervening years. Most notably, the new economic geography literature which deals with the uneven distribution of economic activity across space attributes these discrepancies, in part, to differences in the strength and the pattern of inter-industry linkages. This idea is premised on firms preferring to be in close proximity to suppliers producing a variety of differentiated inputs in large volumes, reducing transportations costs. Likewise, firms gain an advantage in being close to their output market, due to increased demand. In short, firms tend to agglomerate in locations with a large supplier base and demand concentration (Venables, 1996; Krugman, 1998).

Porter (1990) elaborates on the concept of linkages in his cluster theory, adopting a business perspective. Clusters can be considered as agglomerations of firms in specific locales, although linkages in Porter's view are said to be more inclusive than those discussed. Specifically, linkages are created both between firms and between associated institutions (e.g., universities, research centres, standard agencies and trade associations) and firms that compete and/or cooperate with each other. The links are both vertical (backward and forward) and horizontal (the use of similar inputs, technologies and institutions, producing substitute products, etc.). Furthermore, linkages within the cluster

theory have a social dimension hence they incorporate personal relationships and networks (Martin and Sunley, 2003). One crucial premise upon which clustering rests is that cooperation and competition coexist in clusters because they operate in different dimensions. A key task of linkages is to facilitate the exchange and flow of knowledge between firms through cooperation while rivalry is still maintained (Porter, 1990).

With respect to linkages, foreign firms provide an interesting case as their operations are generally dispersed over multiple countries. Ghoshal and Bartlett (1990) conceptualize foreign firms as inter-organizational networks which are linked to other entities such as suppliers, customers, competitors, research institutions and regulators. First, foreign firms face the challenge of effectively coordinating and integrating their geographically-dispersed but interdependent business units. Second, foreign firms are embedded in host countries with heterogeneous contexts which in turn characterize their linkages with local actors. Balancing and effectively managing this complex web of linkages that are established not only within countries, but also on a global scale are critical to the performance of foreign firms (Meyer et al., 2011).

Network theory, of which the conceptualization of foreign firms by Ghoshal and Bartlett (1990) draws on, argues that firms are resource-dependent, and linkages with actors in host countries provide them with access to necessary resources such as market opportunities, natural resources, labour, capital, technology, essential to the foreign firms' long term survival. For example, Almedia and Phene (2004) show that knowledge exchange with linked local firms increases foreign firms' innovativeness. Likewise, interacting with local suppliers and distributors, foreign firms develop a better understanding of the local market conditions and consumer needs (Chen and Chen, 1998). Furthermore, linkages undertaken by foreign firms help them to concentrate on core competencies (Prahalad and Doz, 1987); reduce costs (Doh, 2005; Sako, 2006); share risks and opportunities with other firms (Altenburg, 2000) and complement their own resources and capabilities (Barney, 1991). Nonetheless, forming linkages is not a stand-alone endeavour. Foreign firms are nodal points in linkages (Giroud and Scott-Kennel, 2009) that combine the firm-specific advantages with resources accessible in host countries, and this exerts power and influences on domestic firms located on the other side of the link. Over the past decades, a considerable literature has developed on the effects of foreign firms on their domestic counterparts transmitted through linkages. These effects are discussed in the next subsection (for a survey, see, Görg and Greenaway, 2004).

### 4.2.1. Linkages with Foreign Firms: Implications for Domestic Firms

Foreign firms are generally technologically more-sophisticated than domestic firms, and embody the stock of intangible assets such as managerial know-how and marketing expertise (Caves, 1996; Kokko, 1992). They are usually larger in size (Girma et al., 2002), more productive (Griffith et al., 2004), employ more skilled workers and have better training schemes (Lipsey and Sjöholm, 2004). Furthermore, foreign firms engage in more innovative activities and are more experienced in international market place (Aitken et al., 1997). These superior attributes enable them to overcome the liability of foreignness ―challenges a foreign firm faces due to their unfamiliarity with local conditions (Zaheer, 1995). Emerging research argues that owing to these distinct characteristics, the linkages foreign firms establish with local firms should be different than those formed between domestic firms (Javorcik, 2004; Scott-Kennel and Enderwick, 2005). The expectation is that the performance of domestic firms improves through close and continuous interaction with their foreign counterparts.

### *Productivity in Domestic Firms*

Theory puts forward at least three arguments why productivity in domestic firms may be enhanced through backward linkages with foreign firms. First, foreign firms actively transfer technological, organizational and managerial skills to their suppliers with the purpose of increasing the quality of intermediate inputs. Second, foreign firms may set higher quality requirements for inputs which incentivize suppliers to improve product quality and production processes. Third, local suppliers may achieve scale economies due to increased input demand of foreign firms (Javorcik, 2004; Meyer, 2004). Similarly, the availability of new, differentiated and less costly inputs produced by foreign firms may render domestic ones more productive through forward linkages. The provision of inputs by foreign firms is often bundled with complementary services that may not be accessible via imports or provided by domestic suppliers (Navaretti and Venables, 2004). Concerning to horizontal linkages, local firm productivity may be enhanced through demonstration and labour mobility. First, the former takes place when exposure to the state-of-the-art technology of foreign firms results in the upgrading of technological skills and managerial expertise in domestic firms (Barry et al., 2003). Second, knowledge embedded in the labour force may flow from foreign to domestic firms through physical migration of workers (Görg and Strobl, 2005).

On the one hand, strategic considerations of foreign firms aim to minimize the dissemination of technology to local competitors through horizontal linkages. Knowledge leakage is considered as a loss when they diffuse within the foreign firms' industry as such propagations strengthen the competitive capabilities of rival local firms (Meyer, 2004). On the other hand, technology transfer, training and information-sharing with vertically-linked domestic firms are encouraged because such strategies act as effective tools to ensure product and service quality in foreign firms (Javorcik and Spatareanu, 2011). Hence, productivity increases in domestic firms through horizontal linkages are bound to be limited, whereas gains via vertical linkages are more likely (Javorcik, 2004). Previous empirical work provides support for this line of reasoning. After reviewing more than forty studies, Görg and Greenaway (2004) conclude that there is, at best, mixed evidence concerning productivity increases in domestic firms through horizontal linkages. Most notably, Aitken and Harrison (1999) show that foreign firms negatively affect the productivity of domestic firms in the same sector in Venezuela owing to the reduction of their market share which drives the output level away from the minimum efficient scale. In contrast, Javorcik (2004) reports that local firm productivity in Lithuania is positively associated with foreign firm presence in vertically-related industries. Likewise, Blalock and Gertler (2008) document comparable results for Indonesia, and Javorcik and Spatareanu (2008, 2011) for Romania.

### *Export Decision of Domestic Firms*

Another strand of research is concerned with investigating whether the export decision of domestic firms is affected by linkages made with foreign firms. Kneller and Pisu (2007) argue that there are two stylized facts related to exporting. First, it involves sizeable fixed costs associated with the establishment of distribution channels, investment in advertising to create brand awareness, market research to understand the target market's needs and tastes, market structure and regulations. Second, exporter firms are ex ante more productive than non-exporters. Foreign firm presence might affect the export decision of local firms to the extent that fixed costs are reduced and productivity is increased (Navaretti and Venables, 2004). This can be achieved in multiple ways.

To begin with, foreign firms often have a multi-market presence which may act as a key source of information about overseas markets and consumers. Local firms can also take advantage of trade channels and reputation that have already been established by foreign firms. Taken together, local firms may incur relatively lower fixed costs associated with the export decision (Aitken et al., 1997). Next, domestic firms are geared to exporting if improvements in productivity are realized through the mechanisms elaborated above, such as training the employees of suppliers, demonstration and labour movement. Finally, Greenaway et al., (2004) argue that if increased competition due to foreign firm presence makes domestic firms more productive (e.g., via investment in technology or more efficient use of extant resources), this allows them to start exporting. However, the reverse may also be true. Stiff competition may reduce domestic productivity, as described and evidenced by Aitken and Harrison (1999), and thereby reducing the propensity to export. While the first two effects, termed information externalities by Kneller and Pisu (2007), can be transmitted through both vertical and horizontal linkages, the competition effect on export decisions is more pronounced when foreign and domestic firms operate in the same industry (horizontal linkages).

Empirical studies focus primarily on horizontal linkages in manufacturing industries, and results are mixed. For instance, Greenaway et al., (2004) report that the export decision of firms in the UK is positively affected by the presence and export-orientation of foreign firms in the same industry. Likewise, the probability of a domestic firm exports increases with the R&D intensity of their foreign counterparts. Aitken et al., (1997) and Koenig et al., (2010) reach similar conclusions by incorporating a regional aspect into the analysis for Mexico and France, respectively. Here, the intuition is that the FDI effects decay with distance. In contrast, while the export decision of Spanish firms is found to be independent of FDI presence as shown by Barrios et al., (2003), the export volume of Irish firms is reduced (Ruane and Sutherland, 2005). The authors explain the latter finding by use of Ireland as an export platform to the rest of the EU.

To the best of our knowledge, there is only one study incorporating vertical linkages into this strand of literature. Drawing on UK manufacturing data, Kneller and Pisu (2007) show that domestic firms engage in exporting if they supply intermediate inputs to foreign firms (backward linkages) but, no effect is detected via forward and horizontal linkages. The authors take the analysis one step further by evaluating the impact of linkages on the export volume. Results suggest that local firms export in greater quantities due to increased foreign firm presence in the same as well as vertically-related industries. Moreover, both export-oriented and domestic-market-oriented foreign firms induce domestic firms to export more, but the effect of the former is stronger. According to Kneller and Pisu (2007), this indicates that the competition effect stemming from domestic-market-oriented FDI are superseded by information externalities associated with established foreign exporters.

### *Employment in Domestic Firms*

The importance of linkages is emphasized in the literature investigating the effects of FDI on employment in domestic firms. Regarding horizontal linkages, whether the overall effect is positive or negative depends on the balance between the efficiency-enhancing role of FDI and crowding-out of domestic firms (Görg, 2000). If local firms become more efficient, achieve technical upgrading and innovate more, they can grow faster, start exporting and expand their employment (Lall, 1979; UNCTAD, 1994). In contrast, the crowding-out effect may result in contraction of employment not only in local competitors but also in their local suppliers owing to the shrinkage in demand for inputs (McAleese and McDonald, 1978; UNCTAD, 1994). Offsetting this, foreign firms may generate additional

employment in both upstream and downstream industries through vertical linkages with local firms. This type of linkage effect is formalized by Rodrìguez-Clare (1996).

Empirical work is rare in this area, particularly those focusing on vertical linkages. Nonetheless, the results are encouraging and further research is desirable. To begin with, Görg and Ruane (2010) show that foreign firm presence in the electronics sector in Ireland causes a significant expansion in domestic employment through backward linkages. UNCTAD (1994) estimates that in developing countries for each job available in foreign firms, at least one or two positions are generated indirectly. Karlsson et al., (2009) find evidence of positive employment effects of foreign firms in Chinese firms with a focus on horizontal linkages. In contrast, Driffield (1999) shows that increased FDI presence in UK manufacturing industries leads to a reduction in employment in domestic firms in the same sector.

### 4.2.2. Linkages with Foreign Firms: Implications for Domestic Entrepreneurship

Markusen and Venables (1999) model the responsiveness of domestic entrepreneurship rates to the creation of linkages (both vertical and horizontal) with foreign firms. The key contribution of this work is to allow for heterogeneity of firms in host countries in terms of ownership; namely, foreign vs. domestic. The mechanics of the model are straightforward, and can be characterized as a circular process of economic activity. The underpinning idea is that firms tend to locate in areas with good access to markets and suppliers. In turn, where more firms locate, the market and supply access of other producers expands. These ideas are not new and trace back to Perroux's (1955) 'growth poles', Myrdal's (1957) 'circular and cumulative causation', or Hirschman's (1958) 'forward and backward linkages'. Analogous arguments also exist in Harris (1954) and Pred (1966), as well as, more recently, in Krugman and Venables (1995) and Venables (1996) who adopt a new economic geography perspective.

Among these studies, we have put emphasis on Hirschman's conceptualization as he explicitly placed linkages and entrepreneurship in the same picture, of which the latter is regarded as latent in the economy. He argued that the shortage or excess of some goods and services would stimulate latent entrepreneurs to invest in linked activities. One aspect that Hirschman's analysis left out is the separation of foreign and domestic firms. This dimension is neatly incorporated into the model of Markusen and Venables (1999) whose details are briefly discussed below.

The model considers an economy (the host country) with two industries characterized by imperfect competition and increasing returns to scale. More specifically, these are the final goods (downstream) and intermediate inputs (upstream) producing sectors that are linked through the input-output structure. Two types of firms are identified, foreign and domestic, of which the former only operates in the downstream industry, serving the final demand. In contrast, domestic firms are active both in downstream and upstream industries suggesting that they are connected to foreign firms both through horizontal and backward linkages. One crucial assumption of the model is that inputs can be supplied only by domestic suppliers. They are non-tradable, and cannot be procured from abroad. Moreover, it is a partial equilibrium model, therefore the supply of primary factors is infinitely elastic and there are no income effects in demand. The question Markusen and Venables (1999) address is how foreign firms affect domestic entrepreneurship through linkages.

The predictions of the model are three-fold. First, there is a FDI-induced competition effect on domestic firms in the final goods sector transmitted through *horizontal linkages*. The increases in output lead to a reduction in market price, and

domestic firms lose market share to foreign firms, ultimately going out of business to restore sales of remaining firms to their zero profit level. Thus, FDI leads to the crowding-out of local competitors. Second, the model suggests that the presence of foreign firms increases the demand for locally-produced intermediate inputs. With increasing return to scale and *backward linkages* between foreign and domestic firms, additional demand drives the average costs downward and profits up. This leads to changes in the industry dynamics, stimulating the formation of new domestic firms in the input producing sector. Third, a wide variety of inputs produced in higher volumes coupled with lower prices trigger another stimulus, encouraging entrepreneurship in the final goods industry through *forward linkages*. Hence, through additional demand for intermediate inputs foreign firms alter the number of domestic firms, both in the inputs and final goods producing sectors.

Empirical repercussions of this framework closely follow the findings of Hobday (1995) based on various case studies on newly industrialized East Asian economies. The analysis suggests that foreign firms in countries like Taiwan established strong backward linkages with local suppliers which improved their quality, productivity and variety of inputs (e.g., computer keyboards, sewing machines, bicycles). These enhancements in upstream industries, in turn, stimulated new firm entry (both foreign and domestic) in final goods producing industries through forward linkages. Following this, a second-round backward linkages effect takes places and this process repeats itself over time.

Markusen and Venables (1999) model is beneficial as it provides a general framework to explain the relationship between FDI and domestic entrepreneurship transmitted through both horizontal and vertical linkages. However, the restrictive assumption of the model, i.e., inputs are only supplied by local firms, poorly represents the actual conditions. The overseas procurement of inputs by foreign firms is a common practice especially to guarantee the quality of inputs and to minimize the risks posed by unproven domestic suppliers. Such an international strategy affects the scope of backward linkages with domestic firms, and this in turn feeds back into domestic entrepreneurship. Furthermore, FDI is heterogeneous in nature and undertaken for different reasons (e.g., domestic market oriented, export platform). Similarly, the mode of entry adopted by foreign firms varies, for example, greenfield and M&A. Each of these aspects bears implications for the creation of linkages with domestic firms, and hence for domestic entrepreneurship. We will now concentrate our attention on these implications, and subsequently formulate hypotheses for Turkey.

### 4.2.3. Conditions Affecting the Formation of Linkages

#### *Entry Mode*

The entry mode of foreign firms (greenfield vs. M&A) into host countries is likely to have an impact on the formation of linkages with domestic firms and on domestic entrepreneurship (Meyer, 2004). While greenfield investment adds additional production capacity, M&A involves changes in the ownership structure of fully operational firms. Given their pre-acquisition embeddedness in the local economy, M&A takes over a ready-made web of vertical linkages with domestic firms, of which greenfield investment has yet to build from scratch (UNCTAD, 2001).

FDI via greenfield may initially be slower in establishing a local supplier network which may develop over time (Antalóczy et al., 2001). Regarding M&A, following the acquisition, foreign owners may maintain and strengthen ongoing customer and supplier relationships, and form new ones to the extent that local suppliers are efficient and upgrade their performances in order to meet higher quality standards. However, existing vertical linkages may also be reorganized, and reliance on local firms may weaken over time

(Canabal and White, 2008). Scott-Kennel (2004) provides evidence for the former argument, and shows that local firms acquired by foreign ones in New Zealand are more likely to establish vertical linkages after the ownership change. Supporting this conclusion, Belderbos et al., (2001) find that FDI via M&A is more integrated in the local economy. In contrast, Williams (2005) shows, both theoretically and empirically, that while greenfield investment in the UK creates and expands local supplier linkages—though slower, those which entered by way of M&A cause linkages to deteriorate over time.

Regarding horizontal linkages, as greenfield investment adds to the number of firms engaged in the production of goods or services, it tends to increase competitive pressure, and is more likely to seize the market share of domestic competitors (Meyer, 2004). The reverse interpretation holds for foreign investment through M&A, at least in the short-term (Spencer, 2008). It should be noted that a restructuring process usually takes place in the post-acquisition phase during which additional production capacities with a new set of technologies may be created in the local economy, where competition may be enhanced (Navaretti and Venables, 2004).

***Entry Motivation***

The motives of foreign firms, i.e., domestic-market- vs. export-orientation, can also influence the pattern of input-output linkages established with domestic firms (Hansen et al., 2006, 2009).While the former aims at serving the local market, in the latter case, the host country is used as an export platform to reach other markets by exploiting low cost factors (Meyer, 2004). As foreign firms meeting domestic demand need to adapt their production to local conditions, they offer more potential for promoting backward and forward linkages. Being more familiar with consumer preferences, host country firms can help their foreign counterparts customize goods and services for a better local fit (Altenburg, 2000; UNCTAD, 2000). In contrast, export-oriented foreign firms often have higher quality requirements motivating global sourcing for their inputs that will meet the quality standards of the world market (McIntyre et al., 1996). Owing to their lack of backward and forward linkages with domestic industries, exporter foreign firms are said to be operating in enclaves with no immediate connections to the host economy (Cypher and Dietz, 2008). Moreover, strong local linkages make it too costly to divert from host countries. Most foreign firms with an export-orientation may not favour long-term contracts with local suppliers because the sunk cost will be high under a host country exit decision (UNCTAD, 2000).

Regarding horizontal linkages, competition pressures on domestic firms are more pronounced if foreign firms seek to meet the demand of local consumers rather than having an export-oriented strategy. The use of the host country as an export platform poses less competitive threat as local and foreign firms do not directly compete in the same product market (Spencer, 2008).

***Other Factors***

Foreign firms in host economies are usually the affiliates of multinational enterprises that pursue a dual strategy of global integration and local responsiveness (Paterson and Brock, 2002; Prahalad and Doz, 1987). While certain decisions are made by the parent company and applied at the global level, some other functions may be coordinated at the host country level (Paterson and Brock, 2002), which implies the granting of some autonomy to foreign firms in decision making and resource allocation. Despite being tied to the parent company operations, foreign firms are not mere passive agents to implement the strategies determined at the centre (Andersson et al., 2002). They take the initiative and generate

independent competencies to power the multinational enterprise, of which they are a part (Andersson et al., 2007). Several studies argue that the level of autonomy a foreign firm has affects its local sourcing behaviour and the generation of vertical linkages (e.g., UNCTAD, 2001; Zanfei, 2000). Greater autonomy given to foreign firms is positively associated with the extent of vertical linkages with domestic firms, particularly backward ones (Giroud and Mirza, 2006; Jindra et al., 2009; Williams, 1997).

The decision of foreign firms to source locally, to retain the relationships with existing suppliers and to establish new backward linkages depend on the sophistication of inputs needed, and whether domestic firms are capable of complying with the quality, quantity and logistical standards demanded by foreign firms (Spencer, 2008). More sophisticated and specialized inputs are generally sourced within the global network of the parent company to eliminate the risk attached to unknown or inexperienced local suppliers (Belderbos, et al., 2001; Giroud and Scott-Kennel, 2009), which eventually yields weak backward linkages.

Evidence suggests that foreign firms increase their vertical linkages with local firms over time, as they become more embedded in the local economy (Driffield and Noor, 1999; McAleese and McDonald, 1978). One underlying reason might be that at the time of entry into the host country foreign firms often rely on home country suppliers until they reinforce their competitive position in the market. Gradually, foreign firms shift from global to local sourcing (Chen et al., 2004).

### 4.2.4. Hypotheses for Turkey

Studies investigating the motives of foreign firms in Turkey are of two types. The first relies on survey data based on managers' subjective ratings of various entry motivations. These studies utilize simple statistical techniques such as mean comparison to analyse data. The second is the econometric studies that draw on country-level data on resource endowments, market size, infrastructure, openness of the economy and government policy towards FDI as well as data on the agglomeration of economic activity. A common finding of these studies has been that foreign firms are mainly attracted to Turkey by its market potential and to meet the needs of domestic demand rather than using the county as a low cost export base.

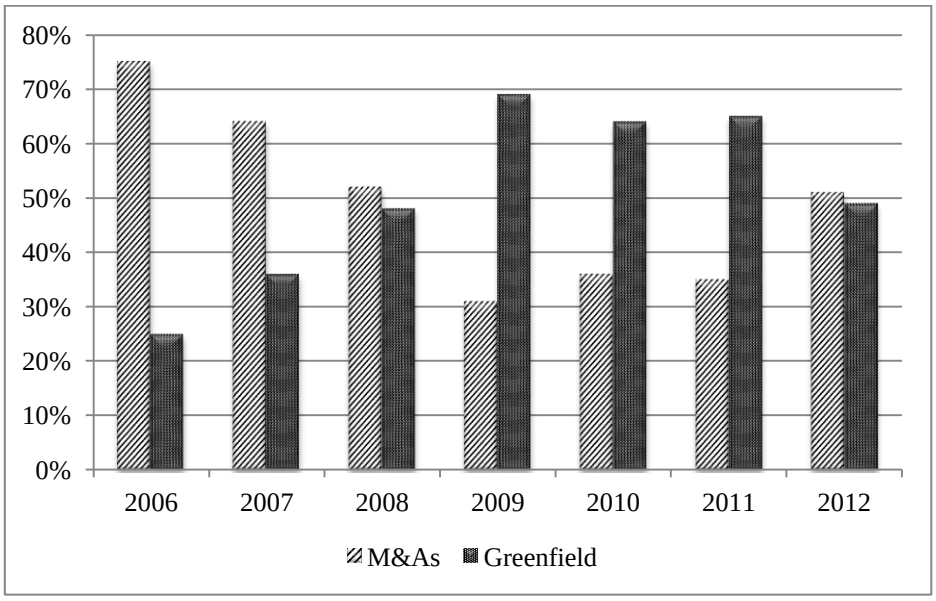
To begin with, Erdilek (1982), using a survey of 43 foreign manufacturing firms operational between 1978-1980, reports that the basic motives of FDI are the rapid expected growth of the economy, subsequent increase of demand for foreign products and expected profitability. In a series of papers, Tatoğlu and Glaister (1998a, 1998b and 1998c) extend the analysis beyond manufacturing data, and find that the highest ranked motives of 98 surveyed foreign firms originating from the US and Europe are to gain presence in new markets and to make use of an unsaturated and dynamic market. Similarly, Coşkun (2001), using manufacturing data in 1994, concludes that foreign firms invest in Turkey mainly due to the growing local market, and they were the less motivated by using the country as an export platform. Yet, this data is old and may not accurately represent the motives of FDI today. The findings of Anıl et al., (2011), however, refute this argument, suggesting that surveyed foreign firms penetrated Turkish market predominantly to serve domestic consumers. In line with these papers, Tatoğlu and Glaister (1996), and Erdal and Tatoğlu (2002) reveal both the size of the domestic market, measured by GDP, and its growth rate are the main determinants of FDI inflows.

A salient feature of Turkey is that its economic development is unevenly distributed, favouring western and coastal regions. Motivated by this, Deichmann et al., (2003) and Yavan (2010) investigate the location decisions of foreign firms at the

subnational level. Both studies suggest that cities with larger income per capita and cities that grow faster attract more foreign firms indicating a market access motive.

As mentioned in the previous section, market-seeking FDI constitutes a competitive threat to domestic firms through horizontal linkages. Accordingly, Kösekahyaoğlu (2006) argues that foreign firms in Turkey have a competitive advantage over rival firms mainly achieved by high R&D investments. Based on a sample of 69 companies operating in both manufacturing and service industries, Tatoğlu and Glaister (1998d) suggest that the financial performance of foreign firms (e.g., sales growth) supersede that of domestic ones, and this has been, to a large extent, facilitated by competitively serving the huge and unsaturated domestic market.[78]

**Figure 4-1:** FDI inflows into Turkey by entry mode




*Source:* Own calculation based on data from the Republic of Turkey Ministry of Economy (www.economy.gov.tr).

As regards to the entry mode, Figure 4-1 shows that foreign firms entered Turkey predominantly through M&A in 2006-2008. This is reversed in the subsequent years where the large proportion of FDI inflows was greenfield investment. The surge in M&A activity in 2006 through 2008 is mainly realized in the banking and financial intermediation sectors (approximately 70%, annually) which are not incorporated in the dataset we use. Once this factor is accounted for, greenfield investments constitute the driving force of FDI inflows. Tatoğlu and Glaister (1998a) failed to find a difference across entry modes with respect to investment motives where local market access is ranked the highest for both investments. The authors interpret the findings as evidence that both greenfield and M&A tend to

[78] There are a few related studies on Turkey though the focus is on the productivity effects via horizontal linkages. For instance, using cross-sectional firm-level data of 1993, Aslanoğlu (2000) finds that labour productivity in domestic manufacturing firms is insignificantly related to the industry's FDI. Results also suggest that the presence of foreign firms increases competition in the covered industries. Second, Lenger and Taymaz (2004) detect negative (labour) productivity effects in manufacturing firms by utilizing industry-level panel data over 1983-2000. Unlike the former paper, this one addresses the endogeneity of foreign firm presence by using the Arellano-Bond type of GMM estimation. Finally, the results obtained Lenger and Taymaz (2006) suggest the absence of technology transfer from foreign firms to their Turkish counterparts. Furthermore, intra-industry FDI is insignificantly associated with the innovative capacities of domestic enterprises.

increase competition. While the former achieves this through adding new production capacity, the latter is likely to implement aggressive competitive strategies during the post-acquisition period.

As illustrated in the previous section, market-oriented foreign firms are more likely to create vertical linkages (both backward and forward) with their domestic counterparts, to gain a better understanding of local conditions. Özdemir (2002) shows that, although focusing on Istanbul, there was an increase in the number of Turkish firms (mostly cleaning and security companies) following the agglomeration of foreign firms in business districts. Tokatlı (2007), in her case study, elaborates on the success of a local supplier of a leading clothing company (Hugo Boss), and the way it emerges as a strong competitor after acquiring the necessary knowledge and expertise during the thirteen-year customer-supplier relationship. Finally, using survey data comprising of 15 foreign firms (operating in manufacturing, services, mining and agriculture) based in Istanbul, Sat (2005) reports that on average 91% of the respondents use locally sourced intermediate inputs.

To date there has been relatively little work on the autonomy of foreign firms in Turkey and its implications. One exception is Selekler-Gökşen and Uysal-Tezölmez (2007) who study the relationship between the level autonomy and performance in 45 foreign firms using survey data. Although not directly related to our work, it is of interest and warrants discussion. It has been reported that the majority of the firms in the sample are given a certain degree of independence to undertake operational decisions, such as choosing local suppliers. However, these firms are less autonomous in areas of strategic decisions, for instance, setting annual sales targets and dividend policy. One interesting aspect is that the majority of the surveyed firms do not have foreign managers appointed by the parent, which could be seen as higher autonomy.

Taking together with the general discussion in the previous subsection and its implementation to the Turkish case, we formulate the following hypotheses:

**Hypothesis 1a:** *A greater level of horizontal linkages with foreign firms will be associated with lower levels of domestic entrepreneurship.*

**Hypothesis 1b:** *A greater level of backward linkages with foreign firms will be associated with higher levels of domestic entrepreneurship.*

**Hypothesis 1c:** *A greater level of forward linkages with foreign firms will be associated with higher levels of domestic entrepreneurship.*

### *Manufacturing versus Service Industries*

Literature on linkages in the service sectors is limited (Miozzo et al., 2012). This is surprising as FDI into service sectors had grown remarkably over the last two decades. Its share in the global FDI stock increased from 49.04% in 1990 to 64.15% in 2012 (UNCTAD, 2014). A similar trend is also observed in Turkey whose details are presented in the next section.

Foreign firms in service sectors are often less capital intensive and have lower sunk costs compared to the manufacturing industries due to the intangible nature of service provision. These particular features render service firms less embedded within host countries, and they are able to relocate their operations to other countries at relatively low cost. We argue that their 'footloose' nature (Navaretti and Venables, 2004) restricts the scope of not only negative, but also positive effects of foreign firms in service sectors on

domestic entrepreneurship through horizontal and vertical linkages, respectively. Namely, we hypothesize that:

**Hypothesis 2a:** *A greater level of horizontal linkages with foreign firms will be associated with lower levels of domestic entrepreneurship in manufacturing industries compared to that in service sectors.*

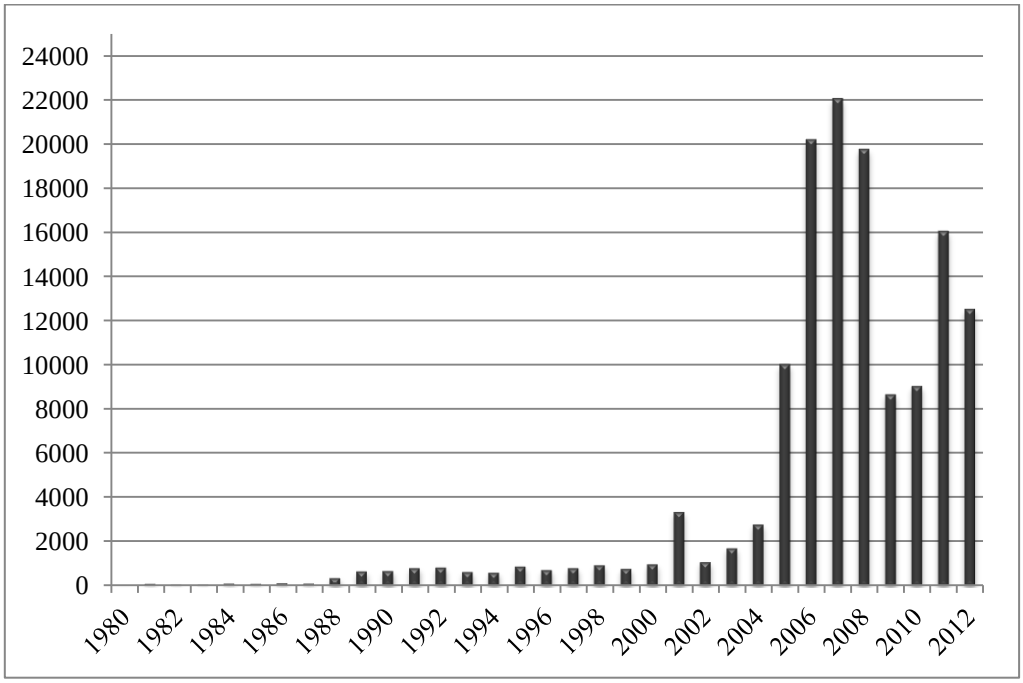
**Hypothesis 2b:** *A greater level of backward linkages with foreign firms will be associated with higher levels of domestic entrepreneurship in manufacturing industries compared to that in service sectors.*

**Hypothesis 2c:** *A greater level of forward linkages with foreign firms will be associated with higher levels of domestic entrepreneurship in manufacturing industries compared to that in service sectors.*

### 4.2.5. FDI Inflows in Turkey

Turkish Republic's legislative history with regards to FDI starts with the Foreign Capital Law, enacted in 1954, which brought almost no inflows into the economy. Turkey was virtually a closed economy to foreign investors in the pre-1980 period, where industrialization via an import-substitution strategy formed the main characteristic of these years.

**Figure 4-2:** FDI inflows into Turkey 1980 - 2012 (millions of US dollars)




*Source:* World Development Indicators (www.data.worldbank.org)

Subsequent to a deleterious balance of payment crisis in 1979, the government initiated a series of reforms aimed at the minimization of state intervention and a slow transmission to a free market economy. More broadly, the objective was to integrate into the global economic system. After 50 years, the country eventually embraced an outward-oriented strategy which involves attracting FDI, export promotion and the liberalization of

product and capital markets. The amount of FDI inflows significantly increased from $18 million in 1980[79] to a high of $663 million in 1989.

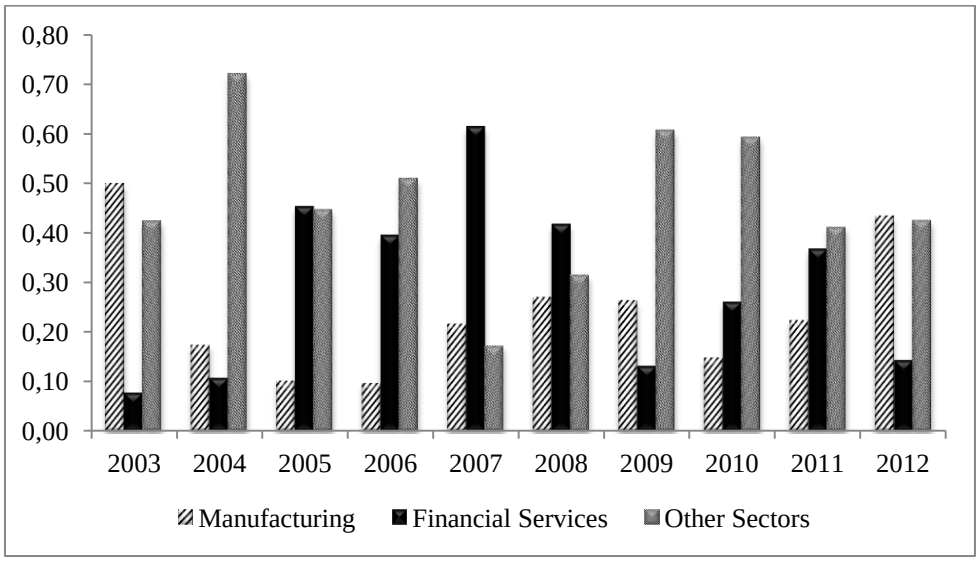
In the following decade, (1990s), Turkey suffered from political instability due to multi-party coalition governments which brought about heavy economic downturns. This period also witnessed two major economic crises in 1994 and 1999. Therefore, the volume of FDI inflows was rather static in the 1990s with a cumulative total of $7 717 million during 1994-1999. The decline in global FDI inflows in the early 2000s also reflected Turkey's economy which saw a 68% reduction in foreign investment from 2001 to 2002. The economic crisis in 2001 is also partly responsible for the sharp downturn in FDI.

The new FDI law introduced in 2003 brought a wide range of opportunities for potential investors. New system moved the policy from being an authorization and approval process to an information-providing scheme, increasing the likelihood of investment. Nonetheless, it was not until 2005 that the volume of FDI inflows experienced a sharp surge (see, Figure 4-2). Specifically, FDI in 2005 ($10 031 million) was 3.6 times greater than the value of 2004 ($2 785 million). The amelioration in macroeconomic indicators such as growth, inflation and interest rates as well as the onset of negotiations with the European Union (EU) authorities regarding the full membership to the union in 2005 raised the credibility of the Turkish economy, attracting more foreign investors. The period of 2005-2008 saw Turkey receive the highest amounts of FDI in economic history with a peak value of $22 047 million in 2007. Afterwards, the effects of the global economic crisis were strongly felt as FDI volumes dropped to $8 663 million in 2009 and $9 036 million in 2010. The corresponding value for 2011 is $16 047 million which indicates some recovery, but again this was followed by a decrease in 2012 with inflows of $12 519 million.

Sectorial breakdown of FDI inflows presented in Figure 4-3 shows that the manufacturing share fluctuates from 9.6% in 2006 to a high of 49% in 2003 with no apparent trend, year to year. In fact, FDI into manufacturing increased in absolute terms during 2005-2008 (not reported). This period is notable because Turkey also received massive inflows into the financial intermediation sector rendering the manufacturing share relatively small in comparison to 2003. A similar pattern is observed in 2011, where FDI into the financial sector grew faster than that of manufacturing. Regarding the remaining sectors represented by grey bars in Figure 4-3, the telecommunication industry was the main FDI recipient during 2004-2006, but this trend did not continue. With the onset of privatization of national companies active in electricity, gas and water supply sector from 2006 onwards, this sector took the lead in attracting FDI inflows. Regarding the home country of investment as shown in Figure 4-4, EU regions take the lead with the Netherlands, the United Kingdom, France, Germany and Italy most prominent. The United States and industrialized countries in Asia are also important sources of FDI inflows for the Turkish economy.

[79] World Development Indicators (from the World Bank) report FDI data for Turkey since 1973 and the total inflows for pre-1980 period equal to $324 million. However, as several reports by the Ministry of Economy indicate (see, 2012 issue below), data on FDI before 1980 is negligible and it is advised not to use this data in statistical analysis due to the lack of reliability.
The report elaborating on FDI into Turkey for 2012 is available at (retrieved on April, 24 2015):
http://www.economy.gov.tr/portal/content/conn/UCM/path/Contribution%20Folders/web_en/Home/FDI/Statistic/Foreign%20Direct%20Investment%20%28FDI%29/Foreign%20Direct%20Investment%20Information%20Report%20%28Annually%29/FDI_2012.pdf

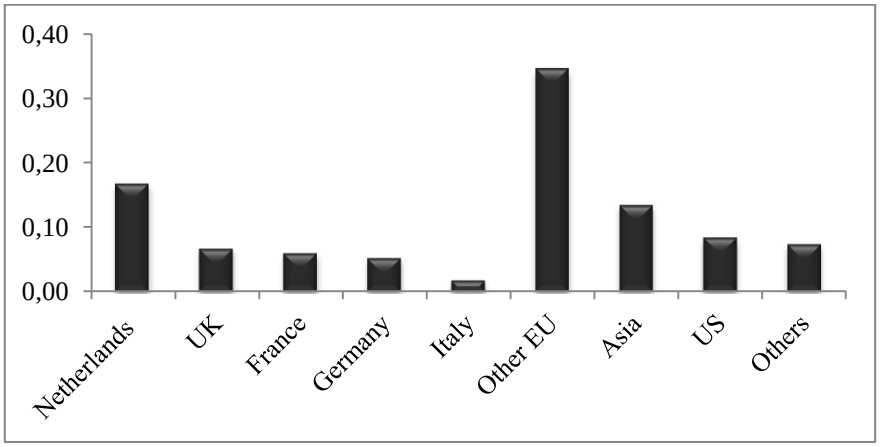
**Figure 4-3:** Relative shares of FDI into Turkey by industry 2003 - 2012[80]




*Source:* Own calculation based on data from the Republic of Turkey Ministry of Economy (www.economy.gov.tr).

Although the Turkish economy has evolved positively during the last decade, there are structural issues that need to be addressed, and are often raised by foreign investors as obstacles to investment. Among the common pitfalls are: the shortage of skilled labour force, insufficient R&D infrastructure combined with the country's negative image on issues such as corruption, bribery, misuse of public authority and a lack of transparency (Transparency International, 2012).

**Figure 4-4:** Relative shares of FDI into Turkey by source country 2003 - 2012




*Source:* Own calculation based on data from the Republic of Turkey Ministry of Economy. (www.economy.gov.tr)

[80] The group 'other sectors' covers NACE rev. 1.1 sections identified by an alphabetical code: C: Mining and quarrying; E: Electricity, gas and water supply; F: Construction; G: Wholesale and resale trade; I: Transportation and storage and communication; K: Real estate, renting and business activities; N: Health and social work; and O: Other community, social and personal service activities.

## 4.3. Data and Modelling of Domestic Entrepreneurship

### 4.3.1. Data

We utilize firm-level panel data collected annually by the Turkish Statistical Institute (TUIK) on manufacturing, service industries as well as mining, quarrying and construction from 2006-2008.[81] TUIK has conducted surveys on Annual Industry and Service Statistics (AISS) since 2003, prior to which separate surveys were undertaken for different sectors. Data coverage is good with approximately 75% of total production value per annum is represented by the sample firms. Furthermore, the sample incorporates not only medium- and large-sized companies, but also small and single-person firms. For example, in 2008, 46 686 enterprises with more than 20 employees and 53 465 firms with less than 20 employees are surveyed. Out of this total number, 1346 firms are foreign-owned whose share of equity exceeds 50% in total capital formation. The corresponding figures for 2006 and 2007 are 1283 and 1239, respectively.

AISS provides data on employment, output, sales, value-added, investment, stocks and each firm's expenditure on labour, material and service inputs. We utilized the employment and output data to construct the variables of interest. At the time of writing, however, we did not have access to the data at the firm level only at the aggregate industry level. Therefore, the aggregation of the firm-level information which is made publicly available on the TUIK's website forms the basis of our data collection. Specifically, all measures in the AISS surveys are reported at 4-digit NACE rev. 1.1 level with the exception of the variable measuring the extent of foreign presence which is retrieved only at 2-digit industry level. As this is the main independent variable of interest, we are constrained to perform the analysis at a relatively aggregated industry level. Furthermore, agriculture, fishing, financial intermediation, government and activities of households are excluded from the AISS, and are therefore outside the scope of this study.

Another point worth mentioning is that the time frame of our study is restricted by the availability of the information on foreign firm presence. Although AISS has collected data since 2003, the key measures needed to compute the existence of FDI across industries exist from 2006 onwards. Furthermore, TUIK changed the classification of economic activity from NACE rev. 1.1 to NACE rev. 2 in 2010, thereby making comparisons of data over time problematic. Since we only have access to industry level information, the matching of the group data from NACE rev. 1.1 to its newer version or vice versa introduce serious noise into the estimation procedure. In order to avoid this problem, we had to confine the analysis to the time period 2006-2008[82] in which data on

[81] In our empirical model, all right-hand-side variables are lagged by one year and the time dimension spans from 2006 to 2008 for these variables. In contrast, the dependent variable is constructed for the years 2007 through 2009 to regress its contemporary values against lagged independent variables.

[82] Some further clarification is needed concerning the availability of our data over years and its industrial classification scheme. All data except than the foreign presence is publicly available at 4-digit NACE rev. 1.1 level for the period 2003-2009, and at 2-digit NACE rev. 2 for 2010-2012. In contrast, we have access to foreign presence data only at 2-digit level based on NACE rev. 1.1 for 2006-2009 and on NACE rev. 2 for 2010-2012. Since the mapping of the aggregated foreign presence data from the latter to the former industrial scheme (or vice versa) results in serious inaccuracies in the data, the time dimension of our study is automatically restricted to the period of 2006-2009. Unfortunately, using lagged independent variables imposes an additional restriction as foreign presence data in 2009 necessitates the utilization of entrepreneurship data in 2010 which is again available at 2-digit NACE rev. 2, and its conversion to the earlier version of the same industrial classification causes distortions in the data. This leaves us with a panel of 49 2-digit NACE rev. 1.1 industries over the period 2006-2008 for the right-hand-side variables and 2007-2009 for the dependent variable. Nonetheless, TUIK has an ongoing project which involves the conversion of

(lagged) foreign presence across industries is available and NACE rev. 1.1 is the common industrial classification scheme.

### 4.3.2. Empirical Specification and Econometric Approach

We model domestic entrepreneurship (measured through net entry rate) as a function of foreign presence together with a set of industry-specific characteristics that have been found in prior empirical studies on firm entry (e.g., Acs and Audretsch, 1989; Barrios et al., 2005; Geroski, 1995; Mata, 1993; Orr, 1974). Our empirical specification takes the following form:

$$\begin{aligned} \text{ENTRY}_{jt} = {} & \beta_0 + \beta_1 \text{HORIZONTAL}_{jt-1} + \beta_2 \text{BACKWARD}_{jt-1} + \beta_3 \text{FORWARD}_{jt-1} + \\ & \beta_4 \text{SIZE}_{jt-1} + \beta_5 \text{GROWTH}_{jt-1} + \beta_6 \text{MES}_{jt-1} + \beta_7 \ln\text{CAPITAL}_{jt-1} + \\ & \beta_8 \ln\text{WAGE}_{jt-1} + \eta_j + \nu_t + \varepsilon_{jt} \end{aligned} \tag{4.1}$$

where $j$ and $t$ index industry and time respectively. While $\text{ENTRY}_{jt}$ denotes the net domestic entry rate, $\text{HORIZONTAL}_{jt-1}$, $\text{BACKWARD}_{jt-1}$ and $\text{FORWARD}_{jt-1}$ are the main explanatory variables of interest corresponding to the intra- and inter-industry foreign firm presence. $\text{SIZE}_{jt-1}$ refers to the size of the industry, $\text{GROWTH}_{jt-1}$ measures the annual industry growth rate and $\text{MES}_{jt-1}$ stands for the minimum efficient scale. $\ln\text{CAPITAL}_{jt-1}$ signifies the industry capital labour ratio whereas $\ln\text{WAGE}_{jt-1}$ measures the average industry wage. $\eta_j$ is the unobserved industry-specific term which affects entry in a fixed manner over time. Finally, while $\nu_t$ is the year-specific term, $\varepsilon_{jt}$ denotes the disturbance term.

As in Görg and Strobl (2002), and Ayyagari and Kosová (2010), we use fixed-effects panel data regression technique to estimate the entry model described in equation 4.1. The advantage of using panel data is that it enables us to control for unobserved heterogeneity caused by industry-level effects. It may be the case that foreign firms target specific industries to enter or entry rates may vary depending on the unobserved industry effects. By applying a fixed effects approach to equation 4.1, we avoid this potential endogeneity bias. Furthermore, all explanatory variables except the year dummies are lagged by one year to make them predetermined, and hence to mitigate the possibility of endogeneity that was not adequately accounted for with the use of industry-fixed effects. Next, all specifications include time dummies to remove the effects of any aggregate economic factors over time, e.g., business cycles, policy changes. Finally, robust standard errors are reported, and they are clustered by industry to deal with potential serial autocorrelation.

### 4.3.3. Variable Definitions

*The dependent variable,* the net entry rate ($\text{ENTRY}_{jt}$), is defined as the net change (gross entries minus exits) in the number of domestic firms over the period *t-1* to *t* divided by the total number of firms at time *t-1* in industry *j*. AISS data does not explicitly report the number of new firm entries and exits, rather it provides the total number of domestic firms active at the end of a particular year. Taking the difference between these aggregate values over consecutive years provides us with the net change even though the actual numbers of gross entries and exits are unknown.

pre-2010 AISS data to NACE rev. 2 with the purpose of generating comparable data across years. The project is expected to be completed in March 2015.

***Horizontal Linkages***

In this study, three different variables are employed to capture the extent of foreign presence in a given industry. The first variable is $HORIZONTAL_{jt-1}$ which is defined as the share of output produced by foreign firms in total output at industry level at time *t-1*. In other words,

$$HORIZONTAL_{jt-1} = \sum_{i\ for\ all\ i \in j} Y_{ijt-1}^{foreign} \Big/ \sum_{i\ for\ all\ i \in j} Y_{ijt-1}^{all\ firms} \tag{4.2}$$

where the numerator refers to the total production of foreign firms in industry *j* at time *t-1*, and the denominator is total output (i.e., output of foreign and domestic firms) of the same industry in the same year. This measure allows us to investigate to what extent foreign presence in a given industry is associated with the rates of domestic firm entry in the same industry. When foreign and domestic firms are in direct competition, this may lead to the exit of some local firms which fail to make the necessary adaptations to operate at higher productivity levels. As a measure of intra-industry foreign presence, this variable was used initially by Caves (1974) and in many papers since (see, Görg and Greenaway (2004) for a survey).[83]

Javorcik (2004) employs a close variant of our horizontal linkages measure where the author weights the output of foreign firms with their equity level. Namely:

$$HORIZONTAL_{jt-1} = \left[ \sum_{i\ for\ all\ i \in j} FOREIGN\ EQUITY_{ijt-1} * Y_{ijt-1}^{foreign} \right] \Big/ \sum_{i\ for\ all\ i \in j} Y_{ijt-1}^{all\ firms} \tag{4.3}$$

In the formula above, *i* captures firms belonging to industry *j* at time *t-1*. The value of this variable increases with the production volumes of foreign firms as well as the share of foreign equity in these firms. Such a treatment, however, requires firm level data on output and equity shares of which current study is unable to utilize. Specifically, we treat all firms with 50% or above foreign equity shares identically, and assume the entire output produced by these firms as foreign. As reported by Görg and Strobl (2001), and Görg and Greenaway (2004), both alternatives are generally highly correlated, and the choice is driven by data availability.

***Vertical Linkages***

In addition to the intra-industry FDI effects, inter-industry linkages between domestic and foreign firms are also considered. For this purpose, we make use of an input-output (IO) table for Turkey to calculate the indices of backward and forward linkages following Javorcik (2004) and others. TUIK prepares IO tables on a regular basis and the 2002 table contains the latest information. The IO tables demonstrate the value of goods and services

[83] Instead of output data, Haskel et al., (2007) and Kosová (2010) use, for instance, employment shares, and Djankov and Hoekman (2001) utilize capital shares. In their meta-analysis of the literature on productivity spillovers from FDI, Görg and Strobl (2001) show that the use of capital shares to capture intra-industry foreign presence produces lower estimates for spillovers compared to the use of employment and output. In contrast, there seems no difference in productivity effects of FDI when employment and output shares are utilized.

sold and purchased between all sectors in an economy, capturing the interrelations among industries. As the tables represent a one-year snapshot of the economy, it is plausible to assume that structural links between industries may improve or weaken over years. Therefore, the best alternative is to use multiple IO tables to account for this possibility. Nonetheless, as the tables for later periods are unavailable, we opted using the most recent for the sample years. Furthermore, the level of industry disaggregation used in the 2002 IO table corresponds to the 2-digit NACE rev. 1.1 breakdown.

We constructed two additional measures of FDI, using the IO table to investigate to what extent foreign presence in the upstream and downstream industries is associated with the domestic entry. First, $\text{BACKWARD}_{jt-1}$ captures the strength of the linkages between domestic firms (as suppliers) and their foreign customers in downstream industries. In other words:

$$BACKWARD_{jt-1} = \sum_{k\ if\ k\neq j} \left[ \left[ Y_{jk} \Big/ \sum_{k\ if\ k\neq j} Y_{jk} \right] * HORIZONTAL_{kt-1} \right] \tag{4.4}$$

where $Y_{jk}$ is the 2-digit upstream industry *j*'s output supplied to downstream industry *k* obtained from 2002 IO table. We focus here on the linkages between domestic and foreign firms, the output levels therefore exclude products supplied for final consumption. This procedure also applies to the imports and exports of intermediate products.[84] Furthermore, within industry input purchases are also omitted as the measure $\text{HORIZONTAL}_{jt-1}$ already accounts for this relation.[85] The above formula[86] suggests that the backward linkages are stronger: i) if the foreign presence in downstream industries is larger (second term in equation 4.4), and ii) if the share of industry *j*'s output purchased by downstream industries with foreign presence is larger (first term in equation 4.4). With intensive backward linkages, the presence of foreign firms as customers is expected to stimulate domestic firm entry since this creates extra demand for intermediate goods supplied to downstream industries.

Second, the variable $\text{FORWARD}_{jt-1}$ captures how strongly domestic firms (as customers) are linked to their foreign suppliers operating in upstream industries. To put it differently:

[84] Our approach is closely related to other papers in the field. For example, while Gorodnichenko et al., (2007) and Girma et al., (2008) exclude imported inputs from their measure, Ayyagari and Kosová (2010) remove imports as well as exports and final consumption in their computation as in our study. Furthermore, Javorcik (2004) excludes both exports and final consumption but not imports as the used IO table for Lithuania does not make this distinction. More specifically, the IO table also does not contain information on exported inputs but their detailed firm-level data provides the volumes of exported inputs, and therefore necessary corrections are made.

[85] We are aware of only one study (see, Blalock and Gertler, 2008) whose backward linkage variable includes purchases from its own sector. Nonetheless, similar to Javorcik (2004), our results are not sensitive to the inclusion of within sector purchases in the computation of the 'backward' measure.

[86] To provide an example how this measure is calculated; assume that wood industry supplies inputs to three different industries in equal proportions: i) paper manufacturing, ii) furniture manufacturing, and iii) construction. Furthermore, suppose that while there are no foreign firms producing papers, half of the furniture production as well as construction output come from foreign firms. Then the 'backward' measure is calculated as follows: (1/3 * 0 ) + (1/3 *1/2) + (1/3*1/2) = 0.33

$$FORWARD_{jt-1} = \sum_{m\ if\ m\neq j} \left[ \left[ Y_{mj} \Big/ \sum_{m\ if\ m\neq j} Y_{mj} \right] * HORIZONTAL_{mt-1} \right] \quad (4.5)$$

where $Y_{mj}$ is the 2-digit upstream industry *m*'s output supplied to downstream industry *j* as inputs obtained from 2002 IO table. As intermediate inputs sold and bought abroad are irrelevant to domestic market transactions, we exclude goods produced for exports[87] as well as the output volumes of imported inputs in the computation of the above formula. Furthermore, for the same reason mentioned above, within industry input procurement is also excluded. The larger the foreign presence in upstream industries (second term in equation 4.5) and the share of inputs secured from them (first term in equation 4.5), the larger the value of $FORWARD_{jt-1}$, and therefore the stronger the forward linkages between domestic and foreign firms. With higher levels of forward linkages new and better quality inputs may be offered to local markets, in turn, this may positively change the incentives towards the formation of domestic firms in downstream industries.

Even though input-output proportions that are obtained from the IO table are constant, there are changes in the level of foreign firm presence over the sample period. Hence, measures capturing both horizontal and vertical linkages alter over the years, that is, they are time-varying and sector-specific. Table 4-B-1 and Table 4-B-2 in the appendix B report data on the net entry rates and the variable $HORIZONTAL_{jt-1}$, that is the fraction of the output produced by foreign firms in total industry production, at the 2-digit NACE rev. 1.1 level over 2006-2008. The entrepreneurship measure is based on our own calculations whereas the proxy for foreign presence is publicly available via the TUIK's website.

As we see in Table 4-B-1, considerable fluctuations are observed in the values of entry rates across years. For example, it varies from -5.3% in the manufacture of office machinery and computers (NACE: 30) in 2007 to a high of 26.3% in the same industry in 2009. The share of output produced by foreign firms in Table 4-B-2 shows considerable variation across years reaching the maximum value of 83.2% in the manufacture of tobacco products (NACE:16) in 2008. Besides the marked changes in domestic entry rates and foreign presence across years, data in these tables report considerable sectorial differences.

### *Control Variables*

$SIZE_{jt-1}$ in equation 4.1 is defined as the total number of employees in industry *j* at time *t-1* which controls for industry size. Some of the newcomers into an industry partly substitute the exiting firms, and the extent of this replacement entry tends to vary as the market size grows or shrinks over time. Therefore, industry size is introduced to the analysis to account for this possibility (Mata, 1991). Furthermore, the incumbent firms in larger markets may have little incentive for the strategic entry deterrence behaviour which makes new entry easier. Hence, a positive association is predicted between industry size and net entry.

[87] As indicated in footnote 84, the elimination of export and import volumes in the computation of the linkage measures is in line with the pertinent literature. Adopting such a methodology requires, however, input-output tables that provide detailed breakdowns of all economic activities into exports, imports and final consumption categories as in our study. Some indirect approaches are also used in the literature to address this issue in the absence of detailed input-output tables. For instance, while Javorcik (2004) uses firm-level exports to mitigate this problem, Girma et al., (2008) uses a similar approach to remove imported inputs from their 'backward' and 'forward' linkages measures.

$GROWTH_{jt-1}$ is measured as the annual employment growth rate of industry *j*. It is suggested that business survival is more likely in growing industries. Furthermore, existing firms can still keep their market share in high growth industries while simultaneously business opportunities are created for new firms. Taken together, we expect a positive relationship to emerge between industry growth and entry.

$MES_{jt-1}$, the minimum efficient scale, is defined as the average size of firms (in terms of employment) in industry *j*. This variable intends to capture the extent to which entry barriers exist in a particular industry with higher values indicating higher barriers to entry. Given this, a negative relationship between minimum efficient scale and entry rates is predicted.

$lnCAPITAL_{jt-1}$ measures the capital labour ratio which is defined as gross investment in tangible assets divided by the number of total employment in industry *j*, and subject to logarithmic transformation due to its highly skewed distribution. In industries with higher capital intensity, the entry of new firms may be deterred due to the high absolute costs that entrants must incur. As such, the cost of the initial investment could be substantial and not many firms can raise sufficient funds in order to enter the sector.

$lnWAGE_{jt-1}$ is the log of the industry's inflation adjusted annual average wage[88] that is defined as the total wage bill (excluding benefits) divided by the number of employees in industry *j*. The occupational choice models applied to the selection into employment and entrepreneurship predict that individuals find it optimal to establish a business if this generates higher value than a wage (Parker, 2004). Alternatively, higher income may reduce financial constraints faced by prospective entrepreneurs and in doing so, may induce new firm formation (Cuervo, 2005). The observed impact on entry rates is the product of the combined effect of these two forces which hinges on their relative strength.

SIZE, GROWTH, MES, lnCAPITAL and lnWAGE are commonly utilized variables in firm entry literature as important determinants of firm entry rates (e.g., Barrios et al., 2005; Geroski, 1995; Görg and Strobl, 2002; Mata and Machado, 1996; Orr, 1974). All variables included in equation 4.1 are constructed by using AISS survey[89] data.[90] The final sample used in this study is a balanced panel of 49 industries at 2-digit NACE rev.1.1 level from 2006-2008. Summary statistics on the data are reported in Tables 4-1 through 4-3. Specifically, we report descriptive statistics on: i) manufacturing industries, ii) service industries and iii) mining and quarrying; construction; electricity, gas and water supply, separately, to be able to provide a comparison and to see where the differences lie across the subgroups of industries.

The descriptive statistics show that domestic net entry rate is, on average, highest in service industries with a value of 8.7% which is closely followed by the group of industries including mining and quarrying; construction; electricity, gas and water supply whose

[88] The annual inflation by year for Turkey during the period of 2006-2008 was 9.7%, 8.4% and 10.1% respectively (TUIK). To remove the inflation effects over time, wages at the industry level are deflated by the consumer price index (CPI) (the base year is 2003). In a similar vein, a given industry's gross investment in tangible assets is deflated by the economy-wide producer price index (PPI) (the base year is 2003). The absence of the sector-specific PPI motivates us to use a common PPI to deflate the gross investment for all industries in the sample. Specifically, TUIK provides PPI for only manufacturing and a set of limited industries. Hence, we have lack of PPI data for certain sectors in our sample. Nonetheless, using the PPI defined at the 2-digit NACE rev. 1.1 industry level where it is available, and substituting it with the economy-wide PPI for the sectors where the data is missing do not change the conclusions of our analysis. The results qualitatively and quantitatively remain similar.

[89] AISS survey data (except than foreign presence) over the sample years is available at (retrieved on December, 04 2014): http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=6148

[90] FDI presence in a given 2-digit NACE rev. 1.1 industry over 2006-2008 compiled by TUIK, and is available at (retrieved on December, 04 2014): http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=10717

**Table 4-1:** Descriptive statistics for manufacturing industries

| VARIABLES | Obs. | Mean | Std. Dev. | Min. | Max. | Std. Dev. (Within) |
|---|---|---|---|---|---|---|
| ENTRY | 69 | 0.061 | 0.188 | -0.287 | 1.045 | 0.138 |
| HORIZONTAL | 69 | 0.157 | 0.188 | 0 | 0.832 | 0.028 |
| BACKWARD | 69 | 0.114 | 0.054 | 0.028 | 0.289 | 0.006 |
| FORWARD | 69 | 0.134 | 0.032 | 0.056 | 0.19 | 0.006 |
| SIZE | 69 | 120565.6 | 117476 | 694 | 409795 | 7315.7 |
| GROWTH | 69 | 0.056 | 0.103 | -0.169 | 0.402 | 0.064 |
| MES | 69 | 49.5 | 140.8 | 2.407 | 834.3 | 22.9 |
| lnCAPITAL | 69 | 9.287 | 0.961 | 7.364 | 13.317 | 0.414 |
| lnWAGE | 69 | 9.268 | 0.484 | 8.627 | 10.589 | 0.026 |

**Table 4-2:** Descriptive statistics for service industries

| VARIABLES | Obs. | Mean | Std. Dev. | Min. | Max. | Std. Dev. (Within) |
|---|---|---|---|---|---|---|
| ENTRY | 57 | 0.087 | 0.266 | -0.2 | 1.706 | 0.13 |
| HORIZONTAL | 57 | 0.126 | 0.115 | 0 | 0.447 | 0.022 |
| BACKWARD | 57 | 0.112 | 0.030 | 0.031 | 0.179 | 0.009 |
| FORWARD | 57 | 0.126 | 0.021 | 0.069 | 0.163 | 0.005 |
| SIZE | 57 | 321914.7 | 438303.3 | 532 | 1779665 | 21430.6 |
| GROWTH | 57 | 0.100 | 0.240 | -0.2 | 1.375 | 0.161 |
| MES | 57 | 30.1 | 70.0 | 1.4 | 290.7 | 2.6 |
| lnCAPITAL | 57 | 9.172 | 1.179 | 6.772 | 11.813 | 0.293 |
| lnWAGE | 57 | 9.283 | 0.577 | 8.170 | 10.508 | 0.071 |

**Table 4-3:** Descriptive statistics for mining, quarrying; construction; electricity, gas, water supply

| VARIABLES | Obs. | Mean | Std. Dev. | Min. | Max. | Std. Dev. (Within) |
|---|---|---|---|---|---|---|
| ENTRY | 21 | 0.077 | 0.133 | -0.116 | 0.5 | 0.112 |
| HORIZONTAL | 21 | 0.097 | 0.110 | 0 | 0.355 | 0.028 |
| BACKWARD | 21 | 0.086 | 0.041 | 0.021 | 0.161 | 0.005 |
| FORWARD | 21 | 0.130 | 0.013 | 0.106 | 0.152 | 0.005 |
| SIZE | 21 | 127053.4 | 238764 | 5918 | 720541 | 13014.7 |
| GROWTH | 21 | 0.057 | 0.109 | -0.076 | 0.305 | 0.084 |
| MES | 21 | 138.9 | 154.9 | 6.7 | 497.8 | 26.4 |
| lnCAPITAL | 21 | 9.805 | 1.021 | 8.053 | 11.332 | 0.332 |
| lnWAGE | 21 | 9.517 | 0.559 | 8.591 | 10.388 | 0.038 |

entry rate is 7.7%. In contrast, average entry rate into manufacturing industries is relatively lower at 6.1%, compared to the two other subgroups. These results are reversed with respect to the intra-industry foreign presence (horizontal linkages) where 15.7% of total industry output is produced by foreign firms in manufacturing sectors. The corresponding

values for the service sector and the third industry bundle are 12.6% and 9.7%, respectively. Furthermore, the strength of backward linkages between domestic and foreign firms is similar in manufacturing and service industries, approximately 11%. Concerning the forward linkages, foreign firms in manufacturing sectors and mining, quarrying; construction; electricity, gas, water supply industries are connected to Turkish firms with comparable degree (13.4% vs. 13%), and they are closely followed by foreign firms operating in service industries (12.6%).

Regarding industry size, while on average each manufacturing industry employs approximately 120 566 workers, the corresponding value for service industries is 321 915. However, average firm size (MES) in manufacturing industries is larger than those reported for service industries—49.5 vs. 30.1 workers, respectively. This indicates that manufacturing industries are comprised of a small number of larger firms compared to the service sector. Finally, descriptive statistics show that service industries grow much faster than manufacturing firms (10% vs. 5.6%), and they are less capital intensive while paying similar wages.

## 4.4. Estimation Results

The general research question that guided this study is the relationship between foreign presence and domestic entry rates into 49 2-digit NACE rev. 1.1 industries in Turkey. More specifically, both horizontal and vertical linkages are considered with a further disintegration of the latter into backward (i.e., Turkish firms supply inputs to their foreign counterparts) and forward (i.e., Turkish firms buy inputs from foreign ones) linkages. We proposed two sets of hypotheses as follows:

H1: While the intra-industry foreign presence is expected to be a negative determinant of domestic entrepreneurship owing to increased competition (H1a), inter-industry linkages are likely to encourage entrepreneurship. The anticipated positive effects of backward (H1b) and forward (H1c) linkages are motivated by the expansion of demand for locally produced inputs upon foreign firm presence and by the availability of less costly and specialized inputs produced by foreign firms, respectively. Corresponding results are reported in Table 4-4

H2: The effects of foreign firm presence on net entry rates are expected to be stronger in manufacturing industries compared to other sectors, especially the service sector. More specifically, it is hypothesized that reductions in domestic entrepreneurship through horizontal linkages (H2a) on the one hand, and increases through backward (H2b) and forward (H2c) linkages on the other, are expected to be larger in manufacturing industries than non-manufacturing ones, especially the service sector. To test our second hypothesis, we created interaction terms between foreign presence measures and a dummy variable for the manufacturing industries, and included them into equation 4.1. Relevant estimation results are presented in Table 4-5.

### 4.4.1. Estimates for Hypothesis One

The following table, Table 4-4, shows the estimates corresponding to H1. While in column (1) we consider the effects of intra-industry FDI (H1a), in columns (2) and (3) the focus of the analysis is on the inter-industry effects on net firm entry, (H1b) and (H1c) respectively. Finally, in column (4) we include all measures of foreign presence in a single specification. Note that estimates shown in Panel A, Table 4-4, draw on the sample comprising all 49 industries: i) manufacturing, ii) services, and iii) mining and quarrying; construction; electricity, gas and water supply.

**Table 4-4:** Estimation results for hypothesis one

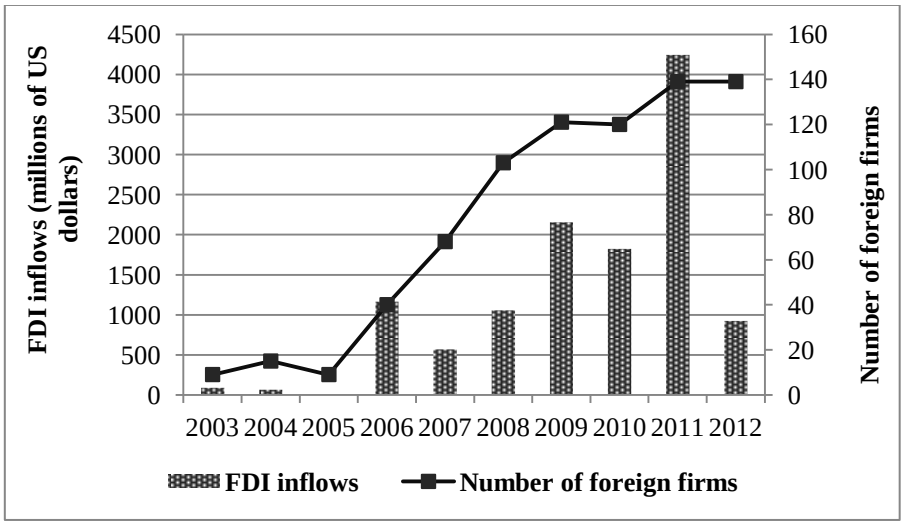
| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | -0.303 | | | -0.226 | -0.173 | | | -0.0176 |
| | (0.339) | | | (0.401) | (0.515) | | | (0.594) |
| $BACKWARD_{t-1}$ | | -0.044 | | -0.110 | | -0.395 | | -0.902 |
| | | (1.341) | | (1.377) | | (1.538) | | (1.624) |
| $FORWARD_{t-1}$ | | | 3.909 | 3.757 | | | 5.626* | 5.778* |
| | | | (3.263) | (3.409) | | | (3.280) | (3.402) |
| $SIZE_{t-1}$ | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.288* | 0.300* | 0.292* | 0.285 | 0.331** | 0.340** | 0.326** | 0.334** |
| | (0.157) | (0.159) | (0.160) | (0.171) | (0.150) | (0.150) | (0.156) | (0.164) |
| $MES_{t-1}$ | 0.001** | 0.001** | 0.001*** | 0.001** | 0.001 | 0.001 | 0.001** | 0.001 |
| | (0.000) | (0.000) | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| $lnCAPITAL_{t-1}$ | 0.013 | 0.014 | 0.010 | 0.009 | -0.027 | -0.029 | -0.037 | -0.040 |
| | (0.063) | (0.064) | (0.060) | (0.061) | (0.068) | (0.068) | (0.055) | (0.055) |
| $lnWAGE_{t-1}$ | 0.639*** | 0.648*** | 0.682*** | 0.674** | 0.531** | 0.534** | 0.565** | 0.566** |
| | (0.237) | (0.238) | (0.250) | (0.252) | (0.213) | (0.213) | (0.227) | (0.227) |
| Year Effects, 2008 | -0.077** | -0.075* | -0.056 | -0.059 | -0.102** | -0.103** | -0.077* | -0.082 |
| | (0.037) | (0.039) | (0.041) | (0.044) | (0.041) | (0.042) | (0.045) | (0.049) |
| Year Effects, 2009 | -0.062* | -0.061* | -0.074* | -0.074** | -0.094** | -0.094** | -0.117*** | -0.115*** |
| | (0.035) | (0.036) | (0.037) | (0.037) | (0.036) | (0.036) | (0.034) | (0.034) |
| Constant | -5.868** | -5.999** | -6.809*** | -6.660** | -4.475** | -4.464** | -5.495** | -5.392** |
| | (2.273) | (2.276) | (2.523) | (2.529) | (1.976) | (1.941) | (2.270) | (2.211) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.216 | 0.212 | 0.228 | 0.219 | 0.235 | 0.234 | 0.269 | 0.258 |

*Notes:* Results correspond to Hypothesis 1.The dependent variable is the net entry rate. Industry-specific variables are (SIZE, GROWTH and MES) computed based on the employment data. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.10

The models in Panel A, Table 4-4, demonstrate that contrary to our expectations, all three measures of foreign presence, HORIZONTAL, BACKWARD and FORWARD, are insignificantly associated with domestic entry rates in Turkey. These conclusions hold when they are included into the regressions one at a time as well as in combination. Thus, estimates in Panel A provide evidence against H1. The next step, in line with Ayyagari and Kosová (2010), restricts the sample to manufacturing and service industries, excluding mining and quarrying; construction; electricity, gas and water supply.[91] Nonetheless, the omission of certain industries should be well-motivated.

To begin with, foreign firms active in *mining and quarrying* sectors often have 'enclave' character with limited forward and backward linkages to the broader economy. Therefore, pooling of data on mining with that of other industries can generate misleading results (Addison and Heshmati, 2003). Furthermore, the mining industry in Turkey is strictly regulated (Arol, 2002), and under relevant legislation,[92] all natural resources belong to the state. Finally, it is mandatory for foreign firms investing in mining to establish partnerships (equity or non-equity forms) with local firms, full ownership is not permitted. Such policies are not in place with regard to other industries.

**Figure 4-5:** FDI into electricity, gas and water supply industries[93]




*Source:* Own calculation based on data from the Republic of Turkey Ministry of Economy (www.economy.gov.tr)

[91] The corresponding 2-digit NACE rev. 1.1 industry codes are (10, 11, 13, 14) for mining and quarrying; (45) for construction; (40, 41) electricity, gas and water supply.

[92] Mining and quarrying operations in Turkey are regulated by the Mining Law No 3213 dated 15 June 1985 (amended in 2005 by Law 5177 and in 2010 by Law 5995).
- Full text in Turkish is available at (retrieved on April, 24 2015):
http://www.mevzuat.gov.tr/MevzuatMetin/1.5.3213.pdf
- A shorter version in English is accessible at (retrieved on December, 09 2014):
http://www.juristurk.com/turkish-mining-law-no-3213-english-version/

[93] The right vertical axis in Figure 4-4 refers to the cumulative total number of foreign firms in a given year. It would be ideal to plot the number of new foreign entrants, but such detailed data is not available. Another alternative would be the use of net change in the number of foreign firms. However, this measure does not distinguish between gross entry and exits. The problem with this variable can be illustrated as follows:
While there are 121 and 120 foreign firms in 2009 and 2010 respectively (net change is -1), the corresponding value is 139 (net change is 0) for both 2011 and 2012. Even though the net change is negative over 2009-2010, and zero over 2011-2012, we see that the industry still attracted sizeable inflows. This possibly indicates there are new foreign entrants but also exits whose numbers cancel out each other rendering the net change negligible. Nonetheless, FDI inflows in 2010 and 2012 also might be due to capacity increase of existing foreign firms.

From 2006 onwards, state-owned firms in *electricity, gas and water supply* industries were privatized, which attracted sizable FDI flows into these sectors (see, Figure 4-5). Likewise, the number of foreign firms markedly increased. The incidence of these sharp changes in the industry dynamics overlaps with the time dimension of the current study from 2006-2008 (lagged). We believe that such drastic variations should be considered carefully as they may distort the results from one period of time to another, especially pre- and post-2006.

Since 2003, Turkey offers generous incentives to foreign investors such as tax deductions, land allocation, social security relief, special tax deductible items and exemptions from tariff payment.[94] However, firms active in the *construction* sector are not eligible for such assistance motivated by the sector's already vibrant, competitive[95] and innovative conditions.

Estimation results obtained from the sample excluding mining and quarrying; construction; electricity, gas and water supply industries due to their aforementioned peculiarities are presented in Panel B, Table 4-4. While the variables HORIZONTAL and BACKWARD remain insignificantly related to domestic entrepreneurship, forward linkages with foreign firms are positively associated with net entry rates, albeit with low significance level (p-value: 0.097). A one percent point increase in forward linkages is associated with a 5.8% rise in net entry rates in manufacturing and service industries (column 8, Table 4-4). Given that the mean value of net entry for this sample is 7.2%, our finding exhibits economic significance. In short, estimates in Panel B refute hypotheses H1a and H1b, and provide mild support for H1c.

In respect to the control variables, we find that, as expected, growing industries accommodate more firms, possibly due to higher survival rates. Second, in theory, the effect of wage rates is less clear. On the one hand, higher wages may induce people into salaried-employment owing to more security and less volatile sources of income compared to entrepreneurial earnings. On the other hand, higher wages may also relieve financial constraints faced by local entrepreneurs. The latter explanation is valid for Turkey. Third, MES, the average industry size, carries an unexpected significant and positive sign, especially in Panel A. Scale economies are expected to impede entrepreneurship since potential entrants are either forced to penetrate the market with large scale production, or face a cost disadvantage with lower profitability. Nonetheless, there are other studies (e.g., Chappell et al., 1990; Hirschey, 1981) which corroborate our finding (see, Siegfried and Evans, 1994 for an extensive survey on the topic). Chappell et al., (1990) infer the positive sign on MES as evidence that new firms enter in industries, where scale economies are important, to compete with and to drive cost-inefficient small firms out of business. It is suggested that although these small firms have a cost disadvantage, they can survive owing to the umbrella pricing strategy[96] implemented by the dominant incumbent firms. Fourth, industry size and capital-labour ratio appear to be less important determinants of Turkish

[94] The details of the incentive packages offered by Turkish authorities to foreign-owned companies are available at (retrieved on April, 24 2015):
http://www.economy.gov.tr/portal/faces/home/invest-incent/invest incentives?_afrLoop=270189534199397&_afrWindowMode=0&_afrWindowId=9o2z963ra_221#!%40%40%3F_afrWindowId%3D9o2z963ra_221%26_afrLoop%3D270189534199397%26_afrWindowMode%3D0%26_adf.ctrl-state%3D9o2z963ra_275

[95] The Herfindahl index is a widely-used measure of market concentration that is defined as the sum of the squares of the market shares of the firms in an industry. It varies from 0 (minimum concentration, maximum competition) and 1 (maximum concentration, minimum competition). The corresponding values for the construction industry are (0.035), (0.015) and (0.021) for the years 2006, 2007 and 2008, respectively.

[96] The umbrella pricing refers to case where there are a few dominant and large firms in a given industry which keep prices high, allowing room for smaller companies with high costs to operate beneath them.

firm entry. Similar results are found in Barbosa and Eiriz (2009), and Mata (1993) in terms of industry size and capital intensity, respectively. While both studies utilize data on Portuguese manufacturing industries, the former also focuses on service industries similar to our work.

Finally, the Turkish economy grew on average by 6.8% from 2002-2007 followed by a sharp decrease to 0.66% in 2008. In 2009, the country experienced another downturn where the output level contracted by 4.8%. In fact, negative and significant coefficients on time dummies, with 2007 being the reference category, are consistent with this overall decline.

### 4.4.2. Estimates for Hypothesis Two

Table 4-5 shows estimates to test the hypothesis H2, whether linkages with foreign firms have differential effects on domestic entry into manufacturing industries compared to non-manufacturing ones. In Panel A which draws on the full sample of 49 industries, the coefficients on the interaction terms between HORIZONTAL and BACKWARD measures, and MANUFACTURING dummy variable are insignificant which is in line with the findings reported in the previous subsection—against our initial expectations. This conclusion holds when we exclude mining and quarrying, construction, electricity, gas and water supply industries as before (Panel B) hence, we find no support for H2a and H2b.

In contrast, H2c which predicts that forward linkages in manufacturing have stronger positive effects on domestic entrepreneurship is confirmed as the coefficients on the relevant interaction terms in Panels A and B are significantly positive at the 5% level. This finding prevails when foreign presence variables added into the models one at a time as well as simultaneously (columns 3 and 4, Panel A, and columns 7 and 8, Panel B). More specifically, a one percent point increase in forward linkages with foreign firms is associated with 11.5% and 11.8% increase in net entry rates, indicating more new firm entries in manufacturing industries compared to non-manufacturing (column 4, Panel A) and service sectors (column 8, Panel A), respectively. As the average net entry rate is 6% in Turkish manufacturing industries over the sample period, these results reveal large economic effects.

### 4.4.3. Robustness Analyses

We have assessed the robustness of our results from the way we define control and linkages variables to accounting for the impact of industry concentration on net entry, and found our findings to be robust. These alternative strategies are applied to assess both of our hypotheses. Relevant estimates are presented in Tables 4-A-1 through 4-A-8 in the appendix A.

First, the main results in Tables 4-4 and 4-5 are replicated by substituting industry-specific variables (i.e., SIZE, GROWTH and MES) with their alternatives computed using sales and output[97] data instead of industry employment. Consistent with the earlier estimates, the variables HORIZONTAL (H1a, H2a) and BACKWARD (H1b, H2b) carry insignificant coefficients whereas domestic entry rates remain positively associated with increased FORWARD linkages with foreign firms (H1c, H2c). More specifically, for H1c, robustness Tables 4-A-1 (based on sales data, columns 7 and 8) and 4-A-2 (based on output data, columns 7 and 8) show that the size of the coefficients on FORWARD shows little variation compared to the benchmark specifications (columns 7 and 8, Table 4-4)

[97] Both industry sales and output are deflated by using the economy-wide PPI. For more information on the availability of sector specific PPI data, see the footnote 88.

**Table 4-5:** Estimation results for hypothesis two

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | -0.303 | | | -0.410 | 0.252 | | | 0.496 |
| | (0.743) | | | (0.808) | (0.775) | | | (0.690) |
| $HORIZONTAL_{t-1}$ * MANUFACTURING | -0.000 | | | 0.082 | -0.638 | | | -0.820 |
| | (0.958) | | | (1.052) | (0.892) | | | (0.963) |
| $BACKWARD_{t-1}$ | | -0.251 | | 0.838 | | -0.438 | | 0.855 |
| | | (1.182) | | (0.906) | | (1.201) | | (0.863) |
| $BACKWARD_{t-1}$ * MANUFACTURING | | 0.891 | | -1.882 | | 0.210 | | -2.214 |
| | | (3.503) | | (4.241) | | (4.235) | | (4.619) |
| $FORWARD_{t-1}$ | | | -1.827 | -3.188 | | | -0.825 | -1.579 |
| | | | (2.845) | (3.309) | | | (2.485) | (2.713) |
| $FORWARD_{t-1}$ * MANUFACTURING | | | 9.789** | 11.47** | | | 10.39** | 11.76** |
| | | | (4.204) | (5.151) | | | (4.377) | (5.018) |
| $SIZE_{t-1}$ | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.288* | 0.299* | 0.258 | 0.235 | 0.345** | 0.340** | 0.287* | 0.298 |
| | (0.161) | (0.160) | (0.167) | (0.187) | (0.154) | (0.153) | (0.163) | (0.179) |
| $MES_{t-1}$ | 0.001 | 0.001** | 0.001*** | 0.001 | 0.001 | 0.001 | 0.001** | 0.001 |
| | (0.001) | (0.001) | (0.000) | (0.001) | (0.001) | (0.001) | (0.000) | (0.001) |
| $lnCAPITAL_{t-1}$ | 0.013 | 0.015 | 0.007 | 0.004 | -0.030 | -0.028 | -0.042 | -0.049 |
| | (0.064) | (0.064) | (0.058) | (0.058) | (0.069) | (0.066) | (0.053) | (0.052) |
| $lnWAGE_{t-1}$ | 0.639*** | 0.651*** | 0.616** | 0.583** | 0.535** | 0.534** | 0.478** | 0.466** |
| | (0.236) | (0.238) | (0.245) | (0.241) | (0.215) | (0.211) | (0.223) | (0.224) |
| Year Effects, 2008 | -0.077** | -0.075* | -0.076* | -0.083* | -0.101** | -0.103** | -0.095** | -0.096* |
| | (0.036) | (0.039) | (0.040) | (0.044) | (0.041) | (0.043) | (0.045) | (0.049) |
| Year Effects, 2009 | -0.062* | -0.062* | -0.097** | -0.099*** | -0.096** | -0.094** | -0.144*** | -0.148*** |
| | (0.035) | (0.036) | (0.037) | (0.036) | (0.036) | (0.037) | (0.035) | (0.036) |
| Constant | -5.868** | -6.062** | -6.032** | -5.567** | -4.490** | -4.481** | -4.576** | -4.350** |
| | (2.254) | (2.263) | (2.371) | (2.258) | (2.018) | (1.854) | (2.087) | (1.996) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.210 | 0.207 | 0.258 | 0.244 | 0.231 | 0.228 | 0.298 | 0.282 |

*Notes:* Results correspond to Hypothesis 2. The dependent variable is the net entry rate. Industry-specific variables (SIZE, GROWTH and MES) are computed based on the employment. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. MANUFACTURING is a dummy variable for manufacturing industries (1=yes, 0= otherwise). lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.1

with no change in the significance level (10%). With respect to H2c, the prediction of stronger positive effects of forward linkages on entry into manufacturing industries compared to non-manufacturing ones is further confirmed by the estimates in robustness Tables 4-A-3 (based on sales data, columns 3, 4, 7 and 8) and 4-A-4 (based on output data, columns 3, 4, 7 and 8). Compared to the original specifications (columns 3, 4, 7 and 8, Table 4-5), the magnitudes of the coefficients on the interaction terms between FORWARD and the manufacturing dummy are relatively larger with an improved significance level (5% or less).

The second sensitivity analysis takes into account the impact of industry concentration on entry rates.[98] To this end, the main results in Tables 4-4 and 4-5 are reproduced by adding the Herfindahl index (HHI) as an additional right-hand-side variable into all specifications. Relevant estimates are displayed in Tables 4-A-5 (for H1) and 4-A-6 (for H2). Once more, the coefficients on the variables capturing horizontal and vertical linkages with foreign firms maintain a similar pattern consisted with the benchmark models.

Most studies exclude within industry input purchases (see, Barrios et al., 2011 for a survey) when computing the measures of backward and forward linkages, similar to our work. One exception is Blalock and Gertler (2008) who investigate the productivity effects of foreign firms on Indonesian firms transmitted through vertical linkages. Following Blalock and Gertler (2008), and Javorcik (2004),[99] we replicate our main results in Tables 4-4 and 4-5 by replacing current foreign presence measures with the alternatives incorporating within industry input procurement.[100] Relevant estimates are displayed in Tables 4-A-7 (for H1) and 4-A-8 (for H2). Once more, we found our results to be broadly robust using these substitute variables.

Concerning the effects of control variables on entry rates, two unexpected results are detected in the sensitivity analysis. First, one would expect that a large industry size is to be conducive to higher firm entry, all other things being equal. In contrast, the SIZE variable carries negative and significant coefficients in a few specifications, particularly in Table 4-A-2 although the magnitudes are negligible. Görg and Strobl (2002) report a similar finding using Irish manufacturing data. To explain this, the authors suggest the possibility that larger industries may experience less new entrants relative to the total number of existing firms. Those firms who do enter the market, however, are often of larger size due to the reduced risk of retaliation from existing firms. To support their argument, Görg and Strobl (2002) regress the average firm size (e.g., MES) of new domestic firms on industry size, and find them to be positively related. Such a relationship may also be present in our data though we are unable to examine this issue explicitly as the data on average size of new firms is currently unavailable.

Second, although the literature is inconclusive and presents contradictory findings, there is increasing evidence showing that concentrated industries deter new entry, often attributed to the potential collusive behaviour by dominant firms (see, Geroski, 1995 for a survey). Estimates in Tables 4-A-5 and 4-A-6 provide evidence against this commonly held view since coefficients on the Herfindahl index are positive and significant (often at

[98] Note that the correlation between HHI and lnCAPITAL is around 0.5 which motivated us to omit the former from the original specification but use it as an additional control variable in the robustness section.

[99] Examining the productivity effects of FDI in Lithuanian manufacturing firms, Javorcik (2004) also omits the volume of inputs an industry buys from itself in their main results. However, robustness checks (not reported) are conducted using alternative BACKWARD and FORWARD variables whose calculations include within industry procurement. The results are found to be robust.

[100] Note that as the variable HORIZONTAL accounts for intra-industry foreign presence, the exclusion or inclusion of inputs bought from one's own industry does not affect this variable.

the 5% level) in all specifications. Kleijweg and Lever (1996) report a similar result using data on Dutch manufacturing industries. One likely explanation is that the availability of above-normal profit in concentrated industries might motive higher entry rates.

### 4.4.4. Limitations

Our results should be interpreted bearing the following caveats in mind. First, we believe that utilizing a fixed effects estimator together with the inclusion of year dummies and lagged independent variables to some extent alleviate the endogeneity concerns especially related to the FDI variables. One alternative would be the use of the dynamic panel GMM estimator where the lagged values of linkages measures ($HORIZONTAL_{t-2}$ and $HORIZONTAL_{t-3}$) are employed as valid instruments in the first-differenced equation. However, the relatively short time span of the present work resulted in lower predictive power of the instruments motivating us not to proceed with this technique. Accordingly, our results should be viewed as correlations rather than causal effects.

Second, related to the first, the sample is smaller than usual in the field and the analysis is conducted at a relatively aggregate industry level. The consequence is that in the intra-industry analysis, we might be capturing vertical linkages between foreign and domestic firms. Such a situation occurs if there are some firms that supply inputs or buy outputs within the same 2-digit NACE rev.1.1 industry. Therefore, an analysis of vertical linkages with more detailed industry data would be better equipped to address this issue.[101]

Third, in the analysis a one-year lag structure is used due to the relatively short time span, and thus we at best capture the short-term effects of horizontal and vertical linkages on entry. It would also be interesting to explore the long-term responsiveness of entry rates to FDI presence.

Fourth, net entry rates, the entrepreneurship measure, did not distinguish between gross entry and exits. It means that to some extent, net entry rates can deviate from gross entry rates, and the size of the difference is determined by the level of firm exit. However, due to data constraints, we are unable to incorporate the firm exits into the analysis. Nonetheless, in the model by Markusen and Venables (1999), the focus is on the changes of the number of firms, which would make net entry rate a more suitable dependent variable.

Fifth, Barrios et al. (2011) propose alternative proxies for backward linkages arguing that foreign firms do not have the same input sourcing behaviour as domestic ones. Therefore, it is inappropriate to base the computation on the inter-industry relationships captured by the IO table of the host country—rather IO tables of the home countries of the foreign investors should be used. Such a strategy requires more extensive data which is currently unavailable.

The last limitation of this study concerns the lack of location and region-specific features. It is noted in the literature that the nature of the various types of linkages between firms is responsive to the locational factors such as being a part of a cluster or an agglomeration, situating in big cities. The integration of this dimension into the analysis requires knowing exactly where a given firm is located, its affiliation with large business

[101] To exemplify the issue, for example, 4-digit NACE manufacturing of carpets and rugs industry (code: 1751) purchases much of its intermediate inputs from two neighbouring sectors (i.e., 1712: preparation and spinning of woollen-type fibres, and 1722: woollen type weaving) which are classified in the same 2-digit industry (i.e., 17: manufacture of textiles). With the level of industry aggregation this study uses, we cannot explicitly account for the backward linkages between these 4-digit industries. Rather, our 2-digit HORIZONTAL variable captures them, and possibly veils a lot of potential variation in the data.

groups and networks, etc. Our data which is supplied at the industry level does not allow us to untangle the sensitivity of our results to the location specific elements. Moreover, Turkey is a large country with sizable regional economic gaps. Especially, the eastern regions suffer from low economic activity and high unemployment rates exacerbated by a three-decade-long political and armed struggle. Hence, controlling for the regional fixed effects would be ideal, but such data are unavailable. Related to this, literature suggests that FDI effects decay with distance (e.g., Lee et al., 2014), and tend to take place at the regional rather than country level. Recognizing this limitation, we recommend this issue as a future research opportunity.

## 4.5. Discussion and Concluding Remarks

In the context of a theoretical framework, Markusen and Venables (1999) examine the potential effects of foreign firm presence on entrepreneurship in host countries. The model yields two main predictions. First, owing to the increased competition transmitted through horizontal linkages, domestic entrepreneurship is reduced as some firms lose their market share to foreign competitors, and are forced to exit. Second, foreign firms increase the demand for locally produced inputs, and induce domestic entry in the supply industries through backward linkages. Although not explicitly considered in the model, foreign firms may also promote firm entry via forward linkages by the provision of new and high quality inputs. Our study attempted to empirically investigate these relationships using data on Turkish manufacturing and service sectors. .

Our results are in contrast with the predictions of the model of Markusen and Venables (1999). We discovered that while domestic entry rates are unresponsive to horizontal and backward linkages, industries with greater forward linkages with foreign firms experience more entrepreneurship.

It is essential to provide insights why new firm formation is not stimulated through backward linkages in the supplier industries. A straightforward explanation would be that the degree of linkages remains insufficient to adequately enable a desirable expansion in the domestic entrepreneurial base. Suffering from the repercussions of the three economic crises in 1994, 1999 and 2001, the Turkish economy picked up through 2000s with an average economic growth of 6.8% from 2002 to 2007. After the global crisis hit in late 2008, a much lower average growth rate, i.e., 3.3%, is realized during the 2008-2013 period. One salient feature of this recovery is that the economic growth in Turkey is heavily dependent on imports. While the share of imported intermediate inputs accounts for 65.8% of total imports in 2006, this figure increased to 71.2% in 2011. This is higher than the OECD[102] average which is 56% in 2011.

The sustained appreciation of the local currency during the last decade—which made imports less costly—and the shift away from labour-intensive production to capital-intensive techniques are seen as the main drivers of imported intermediate inputs. Although to a lesser degree, studies covering previous periods (Pamukçu and De Boer, 2000 for the period of 1968-1990; Senesen and Gunluk-Senesen, 2003 for the period 1973-1996) also suggest that production in Turkey is heavily reliant on imported inputs.

In order to better understand the reasons why firms prefer global rather than local sourcing, a comprehensive study is undertaken by the Central Bank (see, Saygılı et al., 2010). The results shed some light on why the strength of backward linkages with foreign firms remains in its infancy in the Turkish economy. Saygılı et al., (2010) rely on a sample of 145 large firms that account for 50% of value added in their sectors including textiles,

[102] Turkey is an OECD country.

garments, motor vehicles, white goods, machinery, basic metals and non-metallic minerals. Although the sample consists of both domestic and foreign firms, results are presented for each group and in combination.

To begin with, 97% of the foreign firms surveyed stated an absence of domestic production as the rationale behind the use of imported intermediate inputs. This situation is more severe especially in times of economic boom—when there is high demand for intermediate inputs. In turn, the shortage of local suppliers meeting the requirements of foreign firms induces the latter to import. The limited technological capabilities in supplier industries and the lack of investment incentives available to domestic entrepreneurs (e.g., start-up subsidies to ease the initial capital needs) are seen as the main obstacles to entrepreneurship in these sectors though increased demand by foreign firms is present.

Second, the quality and timely delivery of intermediate inputs coupled with lower costs led 75% of the foreign firms surveyed to import rather than source locally. Imported inputs embody advanced technology created abroad, and are more compatible with the modern production technologies of foreign firms that necessitate a range of high quality and sophisticated inputs. Since Turkey's entry into a custom union with the European Union in 1995, high quality European intermediate goods enter the country without any customs fee, increasing the tendency to import. Moreover, the Turkish lira gained considerable value against other major currencies which made imports relatively low cost compared to domestic inputs. The emergence of China and India as major forces in the global economy stands out in this respect, offering low-cost inputs of the same quality.

Approximately a quarter of the foreign firms surveyed (i.e., 24%) indicated that the decision on intermediate input purchases is made at headquarters. Imports from global supply chains are usually grounded on the uninterrupted provision of inputs and reduction in price, owing to the purchase of greater quantities used by foreign affiliates in other countries owned by the same parent. Survey results also suggest that foreign firms in Turkey are often allocated decision rights with regard to operational activities while headquarters retains control over strategic decisions.

Focusing on the period 1950 to 2004, the findings of Onwuka and Zoral (2009) corroborate those of the Central Bank, indicating that the higher demand for imports is driven, among other factors, by FDI inflows.

The aforementioned discussion suggests that it is not the unwillingness of foreign firms to locally source inputs that render weak backward linkages with Turkish suppliers rather, the absence of domestic (quality) production which is fuelled by technology deficiencies. There is heightened demand by foreign firms, but the local economy fails to produce domestic entrepreneurs to form competent local suppliers. Entrepreneurship requires a variety of resources to start including capital, appropriate infrastructure, technological know-how, and perhaps more importantly, innovative capacities to sustain and improve technological development. Recognizing this necessity, the government introduced the new investment incentives scheme from January 2012, which is specifically designed to encourage technology-driven investment in supplier industries to reduce dependency on importing intermediate inputs. Such a policy scheme may induce the creation of new domestic suppliers that reach the required quality standards demanded by foreign firms, thereby reversing the import trend.

An interesting finding of the Central Bank, which corroborates those reported by Aydın et al., (2009), is that over the last decade, Turkish firms producing final goods and services have become more competitive and achieve greater productivity. This is accomplished despite the lack of corresponding progress in the domestic supplier industries. The recent improvements in competitive capabilities of Turkish firms, as

suggested by Saygılı et al., (2010), are mainly realized due to the heavy use of imported inputs as their foreign counterparts. The substitution of local intermediate inputs with imported ones has helped Turkish firms to upgrade their technological endowments, and resulted in productivity gains through learning, variety and quality effects. Aker (2008) relates the use of intermediate inputs to the export-orientation of Turkish firms, and finds an insignificant relationship between the two. The author takes this finding as evidence that most of the imported inputs embodying higher quality are used to produce final goods to meet the local rather than export demand. As discussed before, foreign firms in Turkey also aim to serve local demand which brings them into direct competition with domestic counterparts which have recently achieved a sizable competitive advantage. In fact, the improvements in the competitiveness of Turkish firms might explain the absence of negative effects of foreign firms on entry rates expected to be transmitted through horizontal linkages.

# 4.6. Appendices

## Appendix A: Results Tables for Robustness Analyses

**Table 4-A-1:** Robustness analysis I: Industry-specific variables are based on sales data

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | -0.186 | | | -0.156 | -0.280 | | | -0.222 |
| | (0.470) | | | (0.469) | (0.454) | | | (0.443) |
| $BACKWARD_{t-1}$ | | -0.374 | | -0.631 | | -0.090 | | -0.699 |
| | | (1.247) | | (1.335) | | (1.234) | | (1.454) |
| $FORWARD_{t-1}$ | | | 2.760 | 2.863 | | | 4.699* | 4.838 |
| | | | (3.438) | (3.567) | | | (2.765) | (3.000) |
| $SIZE_{t-1}$ | -0.000 | -0.000* | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.140*** | 0.140*** | 0.140*** | 0.142*** | 0.158*** | 0.158*** | 0.158*** | 0.160*** |
| | (0.035) | (0.034) | (0.036) | (0.034) | (0.019) | (0.019) | (0.020) | (0.019) |
| $MES_{t-1}$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000*** | 0.000*** | 0.000*** | 0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $lnCAPITAL_{t-1}$ | 0.026 | 0.025 | 0.023 | 0.023 | 0.000 | -0.002 | -0.010 | -0.010 |
| | (0.057) | (0.057) | (0.056) | (0.055) | (0.059) | (0.059) | (0.050) | (0.049) |
| $lnWAGE_{t-1}$ | 0.462* | 0.466* | 0.494* | 0.491* | 0.213 | 0.217 | 0.248 | 0.248 |
| | (0.259) | (0.261) | (0.275) | (0.277) | (0.217) | (0.217) | (0.237) | (0.241) |
| Year Effects, 2008 | -0.049 | -0.049 | -0.035 | -0.040 | -0.052 | -0.050 | -0.031 | -0.037 |
| | (0.032) | (0.029) | (0.033) | (0.037) | (0.038) | (0.036) | (0.036) | (0.038) |
| Year Effects, 2009 | -0.054* | -0.052* | -0.063** | -0.062** | -0.052 | -0.053 | -0.072** | -0.070** |
| | (0.028) | (0.029) | (0.028) | (0.029) | (0.035) | (0.036) | (0.032) | (0.032) |
| Constant | -4.407* | -4.418* | -5.062* | -4.951* | -1.897 | -1.946 | -2.792 | -2.689 |
| | (2.601) | (2.592) | (2.908) | (2.905) | (2.054) | (2.056) | (2.455) | (2.445) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.288 | 0.288 | 0.295 | 0.287 | 0.392 | 0.389 | 0.413 | 0.406 |

*Notes:* Results correspond to Hypothesis 1. The net entry rate is the dependent variable. Industry-specific variables (SIZE, GROWTH and MES) are computed based on *sales* data instead of industry *employment*. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.10

**Table 4-A-2:** Robustness analysis II: Industry-specific variables are based on output data

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | -0.203 | | | -0.151 | -0.272 | | | -0.170 |
| | (0.484) | | | (0.483) | (0.497) | | | (0.483) |
| $BACKWARD_{t-1}$ | | -0.320 | | -0.646 | | 0.132 | | -0.578 |
| | | (1.259) | | (1.364) | | (1.217) | | (1.481) |
| $FORWARD_{t-1}$ | | | 3.303 | 3.379 | | | 5.558* | 5.631* |
| | | | (3.404) | (3.543) | | | (2.773) | (2.968) |
| $SIZE_{t-1}$ | -0.000 | -0.000* | -0.000* | -0.000* | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.145*** | 0.145*** | 0.146*** | 0.147*** | 0.167*** | 0.166*** | 0.169*** | 0.170*** |
| | (0.043) | (0.044) | (0.044) | (0.043) | (0.026) | (0.026) | (0.027) | (0.025) |
| $MES_{t-1}$ | -0.000 | -0.000 | -0.000 | -0.000 | 0.000*** | 0.000*** | 0.000*** | 0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $lnCAPITAL_{t-1}$ | 0.026 | 0.025 | 0.022 | 0.021 | 0.002 | 0.001 | -0.009 | -0.010 |
| | (0.056) | (0.057) | (0.054) | (0.054) | (0.061) | (0.061) | (0.051) | (0.050) |
| $lnWAGE_{t-1}$ | 0.438 | 0.440 | 0.472* | 0.471 | 0.201 | 0.201 | 0.235 | 0.237 |
| | (0.266) | (0.266) | (0.280) | (0.282) | (0.226) | (0.224) | (0.244) | (0.250) |
| Year Effects, 2008 | -0.046 | -0.045 | -0.029 | -0.033 | -0.050 | -0.046 | -0.024 | -0.029 |
| | (0.033) | (0.030) | (0.034) | (0.038) | (0.040) | (0.038) | (0.037) | (0.040) |
| Year Effects, 2009 | -0.048* | -0.047 | -0.059** | -0.060* | -0.048 | -0.049 | -0.071** | -0.069** |
| | (0.028) | (0.030) | (0.028) | (0.029) | (0.035) | (0.036) | (0.032) | (0.033) |
| Constant | -4.120 | -4.123 | -4.857 | -4.751 | -1.700 | -1.746 | -2.704 | -2.637 |
| | (2.647) | (2.634) | (2.921) | (2.904) | (2.132) | (2.120) | (2.530) | (2.521) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.281 | 0.280 | 0.292 | 0.283 | 0.371 | 0.369 | 0.403 | 0.394 |

*Notes:* Results correspond to Hypothesis 1. The net entry rate is the dependent variable. Industry-specific variables (SIZE, GROWTH and MES) are computed based on *output* data instead of industry *employment*. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.10

**Table 4-A-3:** Robustness analysis III: Industry-specific variables are based on sales data

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | 0.478 | | | 0.252 | -0.138 | | | 0.129 |
| | (0.623) | | | (0.581) | (0.711) | | | (0.592) |
| $HORIZONTAL_{t-1}$ * MANUFACTURING | -1.100* | | | -0.862 | -0.216 | | | -0.608 |
| | (0.618) | | | (0.723) | (0.747) | | | (0.723) |
| $BACKWARD_{t-1}$ | | -0.521 | | 1.020 | | -0.631 | | 0.665 |
| | | (1.153) | | (0.714) | | (1.264) | | (0.617) |
| $BACKWARD_{t-1}$ * MANUFACTURING | | 0.571 | | -2.421 | | 2.129 | | -1.296 |
| | | (3.358) | | (4.019) | | (3.358) | | (4.429) |
| $FORWARD_{t-1}$ | | | -5.459 | -5.879 | | | -2.277 | -2.901 |
| | | | (3.330) | (3.553) | | | (2.669) | (2.950) |
| $FORWARD_{t-1}$ * MANUFACTURING | | | 14.08*** | 15.12*** | | | 11.29** | 12.50** |
| | | | (4.306) | (4.953) | | | (4.215) | (5.341) |
| $SIZE_{t-1}$ | -0.000 | -0.000* | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.145*** | 0.140*** | 0.141*** | 0.145*** | 0.159*** | 0.158*** | 0.157*** | 0.159*** |
| | (0.032) | (0.034) | (0.029) | (0.027) | (0.019) | (0.019) | (0.018) | (0.017) |
| $MES_{t-1}$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000*** | 0.000*** | 0.000** | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $lnCAPITAL_{t-1}$ | 0.026 | 0.025 | 0.017 | 0.017 | -0.001 | 0.001 | -0.015 | -0.017 |
| | (0.058) | (0.057) | (0.052) | (0.052) | (0.059) | (0.059) | (0.047) | (0.045) |
| $lnWAGE_{t-1}$ | 0.465* | 0.468* | 0.369 | 0.351 | 0.216 | 0.217 | 0.161 | 0.156 |
| | (0.266) | (0.260) | (0.245) | (0.250) | (0.218) | (0.216) | (0.219) | (0.224) |
| Year Effects, 2008 | -0.043 | -0.049 | -0.058* | -0.056 | -0.051 | -0.047 | -0.050 | -0.053 |
| | (0.034) | (0.029) | (0.032) | (0.036) | (0.039) | (0.036) | (0.036) | (0.039) |
| Year Effects, 2009 | -0.049 | -0.053* | -0.088*** | -0.085*** | -0.056 | -0.054 | -0.100*** | -0.103*** |
| | (0.030) | (0.030) | (0.028) | (0.030) | (0.035) | (0.038) | (0.033) | (0.033) |
| Constant | -4.444 | -4.452* | -3.669 | -3.456 | -1.914 | -2.046 | -1.821 | -1.707 |
| | (2.704) | (2.564) | (2.477) | (2.518) | (2.077) | (2.035) | (2.214) | (2.208) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.295 | 0.283 | 0.366 | 0.363 | 0.387 | 0.387 | 0.452 | 0.439 |

*Notes:* Results correspond to Hypothesis 2. The net entry rate is the dependent variable. Industry-specific variables (SIZE, GROWTH and MES) are computed based on *sales* data rather than industry *employment*. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except than the time effects. MANUFACTURING is a dummy variable for manufacturing industries (1=yes, 0= otherwise). lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.10

**Table 4-A-4:** Robustness analysis IV: Industry-specific variables are based on output data

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | 0.311 | | | 0.188 | -0.315 | | | 0.031 |
| | (0.605) | | | (0.576) | (0.737) | | | (0.607) |
| $HORIZONTAL_{t-1}$ * MANUFACTURING | -0.897 | | | -0.741 | 0.069 | | | -0.389 |
| | (0.635) | | | (0.680) | (0.819) | | | (0.749) |
| $BACKWARD_{t-1}$ | | -0.545 | | 1.026 | | -0.462 | | 0.723 |
| | | (1.224) | | (0.778) | | (1.213) | | (0.565) |
| $BACKWARD_{t-1}$ * MANUFACTURING | | 0.905 | | -2.313 | | 2.510 | | -1.127 |
| | | (3.382) | | (4.108) | | (3.583) | | (4.599) |
| $FORWARD_{t-1}$ | | | -4.736 | -5.231 | | | -1.524 | -2.212 |
| | | | (3.582) | (3.830) | | | (2.697) | (2.986) |
| $FORWARD_{t-1}$ * MANUFACTURING | | | 13.78*** | 14.84*** | | | 11.45*** | 12.49** |
| | | | (4.539) | (5.242) | | | (4.189) | (5.340) |
| $SIZE_{t-1}$ | -0.000 | -0.000* | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.150*** | 0.145*** | 0.143*** | 0.147*** | 0.167*** | 0.167*** | 0.165*** | 0.166*** |
| | (0.041) | (0.044) | (0.040) | (0.038) | (0.026) | (0.028) | (0.026) | (0.025) |
| $MES_{t-1}$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000*** | 0.000*** | 0.000** | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $lnCAPITAL_{t-1}$ | 0.026 | 0.025 | 0.015 | 0.015 | 0.002 | 0.004 | -0.015 | -0.017 |
| | (0.058) | (0.056) | (0.051) | (0.052) | (0.062) | (0.061) | (0.048) | (0.046) |
| $lnWAGE_{t-1}$ | 0.440 | 0.442 | 0.361 | 0.349 | 0.200 | 0.197 | 0.144 | 0.141 |
| | (0.268) | (0.266) | (0.248) | (0.251) | (0.228) | (0.223) | (0.222) | (0.227) |
| Year Effects, 2008 | -0.042 | -0.045 | -0.055 | -0.055 | -0.050 | -0.042 | -0.045 | -0.048 |
| | (0.034) | (0.030) | (0.033) | (0.037) | (0.040) | (0.038) | (0.037) | (0.041) |
| Year Effects, 2009 | -0.044 | -0.048 | -0.088*** | -0.087*** | -0.048 | -0.051 | -0.100*** | -0.104*** |
| | (0.030) | (0.031) | (0.028) | (0.031) | (0.036) | (0.039) | (0.034) | (0.034) |
| Constant | -4.149 | -4.167 | -3.648 | -3.498 | -1.693 | -1.838 | -1.727 | -1.652 |
| | (2.709) | (2.606) | (2.498) | (2.523) | (2.144) | (2.092) | (2.256) | (2.236) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.284 | 0.275 | 0.356 | 0.349 | 0.366 | 0.367 | 0.442 | 0.426 |

*Notes:* Results correspond to Hypothesis 2. The net entry rate is the dependent variable. Industry-specific variables (SIZE, GROWTH and MES) are computed based on *output* data rather than industry *employment*. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. MANUFACTURING is a dummy variable for manufacturing industries (1=yes, 0= otherwise). lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.10

**Table 4-A-5:** Robustness analysis V: Industry concentration is taken into account

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | -0.155 | | | -0.098 | 0.078 | | | 0.216 |
| | (0.405) | | | (0.469) | (0.558) | | | (0.655) |
| $BACKWARD_{t-1}$ | | -0.0212 | | -0.113 | | -0.365 | | -0.841 |
| | | (1.148) | | (1.242) | | (1.301) | | (1.438) |
| $FORWARD_{t-1}$ | | | 3.033 | 2.979 | | | 5.011* | 5.327* |
| | | | (2.854) | (3.002) | | | (2.802) | (2.898) |
| $SIZE_{t-1}$ | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | 0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.121 | 0.126 | 0.125 | 0.124 | 0.121 | 0.124 | 0.117 | 0.129 |
| | (0.129) | (0.136) | (0.133) | (0.128) | (0.143) | (0.144) | (0.137) | (0.137) |
| $MES_{t-1}$ | 0.001*** | 0.001*** | 0.002*** | 0.002*** | 0.001* | 0.001* | 0.001*** | 0.001 |
| | (0.001) | (0.000) | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| $lnCAPITAL_{t-1}$ | 0.030 | 0.031 | 0.027 | 0.027 | -0.013 | -0.014 | -0.022 | -0.025 |
| | (0.058) | (0.059) | (0.056) | (0.057) | (0.057) | (0.057) | (0.046) | (0.045) |
| $lnWAGE_{t-1}$ | 0.437** | 0.440** | 0.473** | 0.471** | 0.252 | 0.253 | 0.289 | 0.290 |
| | (0.213) | (0.213) | (0.220) | (0.221) | (0.170) | (0.171) | (0.188) | (0.188) |
| $HHI_{t-1}$ | 1.251** | 1.264** | 1.223** | 1.216* | 1.501** | 1.493** | 1.449** | 1.468** |
| | (0.620) | (0.608) | (0.591) | (0.608) | (0.649) | (0.619) | (0.573) | (0.603) |
| Year Effects, 2008 | -0.069** | -0.068* | -0.054 | -0.056 | -0.098*** | -0.101*** | -0.078* | -0.080* |
| | (0.033) | (0.036) | (0.037) | (0.039) | (0.036) | (0.037) | (0.040) | (0.043) |
| Year Effects, 2009 | -0.066* | -0.066* | -0.076** | -0.076** | -0.105*** | -0.104*** | -0.124*** | -0.124*** |
| | (0.035) | (0.035) | (0.037) | (0.037) | (0.030) | (0.030) | (0.030) | (0.029) |
| Constant | -4.472* | -4.525* | -5.199** | -5.136** | -2.418 | -2.360 | -3.341* | -3.309 |
| | (2.267) | (2.294) | (2.365) | (2.419) | (1.782) | (1.765) | (1.969) | (1.987) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.297 | 0.296 | 0.306 | 0.296 | 0.347 | 0.347 | 0.374 | 0.366 |

*Notes:* Results correspond to Hypothesis 1.The net entry rate is the dependent variable. Herfindahl index (HHI) is added to the models to control for industry concentration. Industry-specific variables (SIZE, GROWTH and MES) are computed based on employment as in the original specifications. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.10

**Table 4-A-6:** Robustness analysis VI: Industry concentration is taken into account

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | -0.570 | | | -0.649 | -0.036 | | | 0.207 |
| | (0.793) | | | (0.822) | (0.790) | | | (0.729) |
| $HORIZONTAL_{t-1}$ * MANUFACTURING | 0.749 | | | 0.777 | 0.174 | | | -0.032 |
| | (1.183) | | | (1.266) | (1.139) | | | (1.239) |
| $BACKWARD_{t-1}$ | | -0.234 | | 0.759 | | -0.318 | | 0.539 |
| | | (0.956) | | (0.734) | | (0.891) | | (0.769) |
| $BACKWARD_{t-1}$ * MANUFACTURING | | 0.917 | | -1.994 | | -0.227 | | -2.479 |
| | | (3.252) | | (4.214) | | (3.958) | | (4.698) |
| $FORWARD_{t-1}$ | | | -1.920 | -3.238 | | | 0.306 | -0.294 |
| | | | (2.664) | (3.018) | | | (2.680) | (2.582) |
| $FORWARD_{t-1}$ * MANUFACTURING | | | 8.529** | 10.10** | | | 7.644* | 8.754* |
| | | | (3.711) | (4.443) | | | (4.203) | (4.487) |
| $SIZE_{t-1}$ | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | 0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.098 | 0.125 | 0.104 | 0.068 | 0.116 | 0.124 | 0.103 | 0.108 |
| | (0.143) | (0.137) | (0.139) | (0.151) | (0.158) | (0.145) | (0.144) | (0.158) |
| $MES_{t-1}$ | 0.002* | 0.001** | 0.001*** | 0.001 | 0.001 | 0.001 | 0.001*** | 0.001 |
| | (0.001) | (0.001) | (0.000) | (0.001) | (0.001) | (0.001) | (0.000) | (0.001) |
| $lnCAPITAL_{t-1}$ | 0.032 | 0.032 | 0.023 | 0.022 | -0.012 | -0.014 | -0.030 | -0.031 |
| | (0.057) | (0.060) | (0.055) | (0.054) | (0.057) | (0.056) | (0.044) | (0.043) |
| $lnWAGE_{t-1}$ | 0.415** | 0.443** | 0.426* | 0.380* | 0.248 | 0.252 | 0.244 | 0.230 |
| | (0.197) | (0.213) | (0.213) | (0.193) | (0.164) | (0.170) | (0.187) | (0.176) |
| $HHI_{t-1}$ | 1.314* | 1.264** | 1.162* | 1.203* | 1.514** | 1.493** | 1.352** | 1.362* |
| | (0.656) | (0.613) | (0.624) | (0.686) | (0.687) | (0.623) | (0.626) | (0.704) |
| Year Effects, 2008 | -0.069** | -0.068* | -0.071* | -0.078** | -0.099*** | -0.102** | -0.091** | -0.094** |
| | (0.033) | (0.036) | (0.037) | (0.038) | (0.036) | (0.038) | (0.040) | (0.044) |
| Year Effects, 2009 | -0.067* | -0.067* | -0.095** | -0.097*** | -0.105*** | -0.103*** | -0.144*** | -0.144*** |
| | (0.034) | (0.035) | (0.037) | (0.035) | (0.031) | (0.031) | (0.032) | (0.033) |
| Constant | -4.302** | -4.589* | -4.602** | -4.048* | -2.396 | -2.340 | -2.810 | -2.559 |
| | (2.116) | (2.317) | (2.217) | (2.017) | (1.735) | (1.747) | (1.859) | (1.729) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.296 | 0.292 | 0.327 | 0.316 | 0.341 | 0.341 | 0.388 | 0.370 |

*Notes:* Results correspond to Hypothesis 2. The net entry rate is the dependent variable. Herfindahl index (HHI) is added to the models to control for industry concentration. Industry-specific variables (SIZE, GROWTH and MES) are computed based on employment as in the original specifications. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. MANUFACTURING is a dummy variable for manufacturing industries (1=yes, 0= otherwise). lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.10

**Table 4-A-7:** Robustness analysis VII: Within-industry input purchases are considered

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | -0.303 | | | -0.220 | -0.173 | | | -0.022 |
| | (0.339) | | | (0.391) | (0.515) | | | (0.624) |
| $BACKWARD_{t-1}$ | | -0.521 | | -0.492 | | -0.759 | | -0.822 |
| | | (2.073) | | (1.921) | | (2.233) | | (2.087) |
| $FORWARD_{t-1}$ | | | 4.242 | 3.969 | | | 6.540 | 6.526 |
| | | | (4.090) | (4.232) | | | (4.111) | (4.195) |
| $SIZE_{t-1}$ | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000 | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.288* | 0.303* | 0.295* | 0.291* | 0.331** | 0.340** | 0.329** | 0.333** |
| | (0.157) | (0.159) | (0.159) | (0.168) | (0.150) | (0.150) | (0.155) | (0.163) |
| $MES_{t-1}$ | 0.001** | 0.001** | 0.001** | 0.001** | 0.001 | 0.001* | 0.001** | 0.001 |
| | (0.000) | (0.000) | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| $lnCAPITAL_{t-1}$ | 0.013 | 0.013 | 0.012 | 0.011 | -0.027 | -0.029 | -0.035 | -0.036 |
| | (0.063) | (0.064) | (0.061) | (0.061) | (0.068) | (0.067) | (0.057) | (0.056) |
| $lnWAGE_{t-1}$ | 0.639*** | 0.652*** | 0.691*** | 0.685** | 0.531** | 0.539** | 0.585** | 0.591** |
| | (0.237) | (0.240) | (0.256) | (0.259) | (0.213) | (0.217) | (0.235) | (0.238) |
| Year Effects, 2008 | -0.077** | -0.077* | -0.058 | -0.063 | -0.102** | -0.104** | -0.078* | -0.082 |
| | (0.037) | (0.040) | (0.040) | (0.045) | (0.041) | (0.042) | (0.044) | (0.049) |
| Year Effects, 2009 | -0.062* | -0.060 | -0.072* | -0.071* | -0.094** | -0.093** | -0.115*** | -0.113*** |
| | (0.035) | (0.036) | (0.037) | (0.037) | (0.036) | (0.038) | (0.034) | (0.034) |
| Constant | -5.868** | -5.983** | -6.858** | -6.683** | -4.475** | -4.492** | -5.678** | -5.642** |
| | (2.273) | (2.282) | (2.634) | (2.654) | (1.976) | (1.977) | (2.411) | (2.392) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.216 | 0.213 | 0.226 | 0.217 | 0.235 | 0.235 | 0.268 | 0.256 |

*Notes:* Results correspond to Hypothesis 1. The net entry rate is the dependent variable. Within-industry input procurement is included into the calculation of BACKWARD and FORWARD variables. Industry-specific variables (SIZE, GROWTH and MES) are computed based on employment as in the original specifications. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.10

**Table 4-A-8:** Robustness analysis VIII: Within-industry input purchases are considered

| | PANEL A | | | | PANEL B | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $HORIZONTAL_{t-1}$ | -0.303 | | | -0.522 | 0.252 | | | 0.458 |
| | (0.743) | | | (0.820) | (0.775) | | | (0.712) |
| $HORIZONTAL_{t-1}$ * MANUFACTURING | -0.000 | | | 0.155 | -0.638 | | | -0.786 |
| | (0.958) | | | (1.114) | (0.892) | | | (0.997) |
| $BACKWARD_{t-1}$ | | -0.679 | | 0.842 | | -0.810 | | 1.168 |
| | | (1.760) | | (1.369) | | (1.764) | | (1.250) |
| $BACKWARD_{t-1}$ * MANUFACTURING | | 0.870 | | -2.922 | | 0.268 | | -2.319 |
| | | (6.293) | | (5.449) | | (6.786) | | (5.669) |
| $FORWARD_{t-1}$ | | | -3.064 | -4.745 | | | -1.262 | -1.794 |
| | | | (3.196) | (3.997) | | | (2.957) | (3.242) |
| $FORWARD_{t-1}$ * MANUFACTURING | | | 12.94** | 14.83** | | | 12.96** | 14.00** |
| | | | (5.536) | (6.447) | | | (5.892) | (6.476) |
| $SIZE_{t-1}$ | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $GROWTH_{t-1}$ | 0.288* | 0.304* | 0.252 | 0.221 | 0.345** | 0.340** | 0.283* | 0.287 |
| | (0.161) | (0.158) | (0.170) | (0.191) | (0.154) | (0.149) | (0.166) | (0.184) |
| $MES_{t-1}$ | 0.001 | 0.001** | 0.001*** | 0.001* | 0.001 | 0.001* | 0.001** | 0.001 |
| | (0.001) | (0.000) | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| $lnCAPITAL_{t-1}$ | 0.013 | 0.014 | 0.008 | 0.006 | -0.030 | -0.028 | -0.039 | -0.043 |
| | (0.064) | (0.063) | (0.058) | (0.057) | (0.069) | (0.064) | (0.054) | (0.053) |
| $lnWAGE_{t-1}$ | 0.639*** | 0.650*** | 0.602** | 0.569** | 0.535** | 0.538** | 0.476** | 0.473* |
| | (0.236) | (0.241) | (0.248) | (0.248) | (0.215) | (0.222) | (0.229) | (0.238) |
| Year Effects, 2008 | -0.077** | -0.077* | -0.080** | -0.090** | -0.101** | -0.104** | -0.096** | -0.096* |
| | (0.036) | (0.040) | (0.040) | (0.045) | (0.041) | (0.042) | (0.044) | (0.049) |
| Year Effects, 2009 | -0.062* | -0.061 | -0.098** | -0.100*** | -0.096** | -0.093** | -0.143*** | -0.148*** |
| | (0.035) | (0.037) | (0.037) | (0.035) | (0.036) | (0.039) | (0.036) | (0.037) |
| Constant | -5.868** | -5.995** | -5.854** | -5.339** | -4.490** | -4.495** | -4.552** | -4.475** |
| | (2.254) | (2.273) | (2.411) | (2.337) | (2.018) | (1.954) | (2.168) | (2.190) |
| Observations | 147 | 147 | 147 | 147 | 126 | 126 | 126 | 126 |
| Industries, Years | 49, 3 | 49, 3 | 49, 3 | 49, 3 | 42, 3 | 42, 3 | 42, 3 | 42, 3 |
| Adjusted $R^2$ | 0.210 | 0.207 | 0.263 | 0.250 | 0.231 | 0.228 | 0.301 | 0.283 |

*Notes:* Results correspond to Hypothesis 2. The net entry rate is the dependent variable. Within-industry input procurement is included into the calculation of BACKWARD and FORWARD variables. Industry-specific variables (SIZE, GROWTH and MES) are computed based on employment as in the original specifications. Panel A includes all 49 2-digit NACE rev. 1.1 industries. PANEL B excludes industries mining and quarrying, construction, electricity, gas and water supply. All independent variables are lagged by one-year except the time effects. MANUFACTURING is the dummy variable for manufacturing industries (1=yes, 0= otherwise). lnCAPITAL and lnWAGE are subject to logarithmic transformation. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the industry level. *** p<0.01, **p<0.05, *p<0.1

## Appendix B: Additional Tables

**Table 4-B-1:** Net domestic entry rates (%)

| NACE rev. 1.1 Section | NACE rev. 1.1 Division | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| **C - MINING and QUARRYING** | | | | |
| Mining of coal and lignite; extraction of peat | 10 | 8.8 | 5.9 | -9.1 |
| Extraction of crude petroleum and natural gas | 11 | -7.7 | 50.0 | 16.7 |
| Mining of metal ores | 13 | 19.3 | 14.0 | 11.6 |
| Other mining and quarrying | 14 | 1.9 | 8.7 | -2.0 |
| **D - MANUFACTURING** | | | | |
| Manufacture of food products and beverages | 15 | -15.4 | 11.9 | 15.2 |
| Manufacture of tobacco products | 16 | 20.8 | -3.4 | -14.3 |
| Manufacture of textiles | 17 | -8.4 | 2.4 | -7.3 |
| Manufacture of wearing apparel | 18 | 9.0 | -5.8 | -3.2 |
| Tanning and dressing of leather | 19 | -12.6 | -14.7 | 3.4 |
| Manufacture of wood and of products of wood and cork | 20 | -3.9 | -0.7 | -3.7 |
| Manufacture of pulp, paper and paper products | 21 | 4.0 | -5.3 | -5.1 |
| Publishing, printing and reproduction of recorded media | 22 | 5.8 | -2.0 | 7.0 |
| Manufacture of coke, refined petroleum products and nuclear fuel | 23 | 24.0 | 25.8 | -28.7 |
| Manufacture of chemicals and chemical products | 24 | 2.0 | -7.4 | 1.2 |
| Manufacture of rubber and plastic products | 25 | 10.7 | 4.6 | 19.2 |
| Manufacture of other non-metallic mineral products | 26 | 11.0 | 0.9 | 2.1 |
| Manufacture of basic metals | 27 | 18.6 | -14.7 | -1.1 |
| Manufacture of fabricated metal product | 28 | 16.1 | 3.9 | -2.7 |
| Manufacture of machinery and equipment n.e.c. | 29 | 15.8 | 8.9 | -16.5 |
| Manufacture of office machinery and computers | 30 | -5.3 | 5.6 | 26.3 |
| Manufacture of electrical machinery and apparatus n.e.c. | 31 | 8.1 | 4.3 | 8.2 |
| Manufacture of radio, television and communication equipment | 32 | 29.1 | -22.3 | 7.4 |
| Manufacture of medical, precision and optical instruments, watches and clocks | 33 | 24.8 | 28.2 | -5.6 |
| Manufacture of motor vehicles, trailers and semi-trailers | 34 | 7.8 | -12.2 | 13.3 |
| Manufacture of other transport equipment | 35 | 38.7 | 14.7 | 4.6 |
| Manufacture of furniture; manufacturing n.e.c. | 36 | -6.4 | 3.2 | 4.5 |
| Recycling | 37 | 56.0 | 12.8 | 104.5 |
| **E - ELECTRUCITY, GAS and SUPPLY** | | | | |
| Electricity, gas, steam and hot water supply | 40 | 15.7 | 5.8 | 8.6 |
| Collection, purification and distribution of water | 41 | -3.9 | -5.6 | 7.6 |
| **F - CONSTRUCTION** | 45 | 13.8 | -11.6 | 12.8 |
| **G - WHOLESALE and RETAIL TRADE** | | | | |
| Sale, maintenance and repair of motor vehicles and motorcycles | 50 | -0.6 | 1.2 | -8.9 |
| Wholesale trade and commission trade | 51 | 4.4 | 0.7 | -7.7 |
| Retail trade, except of motor vehicles and motorcycles | 52 | 2.6 | 1.7 | -7.2 |
| **H - HOTELS and RESTAURANTS** | 55 | 0.8 | 0.8 | -4.3 |
| **I - TRANSPORT, STORAGE and COMMUNICATION** | | | | |
| Land transport; transport via pipelines | 60 | 3.2 | -1.3 | -4.8 |
| Water transport | 61 | 3.9 | -10.9 | -20.0 |
| Air transport | 62 | -1.6 | 4.9 | 3.1 |
| Supporting and auxiliary transport activities; activities of travel agencies | 63 | 0.5 | -1.2 | -3.9 |
| Post and telecommunications | 64 | 16.2 | 17.8 | 8.8 |
| **K - REAL ESTATE, RENTING and BUSINESS ACTIVITIES** | | | | |
| Real estate activities | 70 | 20.6 | 9.5 | -3.9 |
| Renting of machinery and equipment | 71 | 21.3 | 12.7 | -1.0 |
| Computer and related activities | 72 | 17.4 | 11.4 | 25.8 |
| Research and development | 73 | 170.6 | 82.6 | 53.6 |
| Research and development | 74 | 10.9 | 3.0 | 7.2 |
| **M - EDUCATION** | 80 | 8.2 | 3.5 | 10.9 |
| **N - HEALTH and SOCIAL WORK** | 85 | 4.1 | -3.6 | -8.1 |
| **O - OTHER COMMUNITY, SOCIAL and PERSONAL SERVICE ACTIVITIES** | | | | |
| Sewage and refuse disposal, sanitation and similar activities | 90 | 16.1 | 10.1 | -4.6 |
| Recreational, cultural and sporting activities | 92 | 16.1 | 3.2 | -9.5 |
| Other service activities | 93 | 8.2 | 3.3 | -2.2 |

*Source:* Own calculation based on the Annual Industry and Service Statistics data provided by TUIK.

**Table 4-B-2:** Horizontal (intra-industry) linkages (%)

| NACE rev. 1.1 Section | NACE rev. 1.1 Division | 2006 | 2007 | 2008 |
|---|---|---|---|---|
| **C - MINING and QUARRYING** | | | | |
| Mining of coal and lignite; extraction of peat | 10 | 0.0 | 0.0 | 0.0 |
| Extraction of crude petroleum and natural gas | 11 | 35.5 | 32.6 | 19.6 |
| Mining of metal ores | 13 | 20.7 | 23.9 | 19.7 |
| Other mining and quarrying | 14 | 6.6 | 7.7 | 6.4 |
| **D - MANUFACTURING** | | | | |
| Manufacture of food products and beverages | 15 | 11.2 | 11.6 | 13.3 |
| Manufacture of tobacco products | 16 | 61.4 | 69.0 | 83.2 |
| Manufacture of textiles | 17 | 1.7 | 1.6 | 2.5 |
| Manufacture of wearing apparel | 18 | 3.7 | 4.0 | 3.8 |
| Tanning and dressing of leather | 19 | 0.0 | 0.0 | 1.7 |
| Manufacture of wood and of products of wood and cork | 20 | 0.7 | 0.3 | 0.2 |
| Manufacture of pulp, paper and paper products | 21 | 16.4 | 17.7 | 18.9 |
| Publishing, printing and reproduction of recorded media | 22 | 2.3 | 2.5 | 2.1 |
| Manufacture of coke, refined petroleum products and nuclear fuel | 23 | 0.2 | 0.1 | 0.4 |
| Manufacture of chemicals and chemical products | 24 | 36.7 | 32.3 | 31.6 |
| Manufacture of rubber and plastic products | 25 | 16.7 | 18.8 | 20.6 |
| Manufacture of other non-metallic mineral products | 26 | 7.7 | 10.4 | 9.3 |
| Manufacture of basic metals | 27 | 2.5 | 2.4 | 2.2 |
| Manufacture of fabricated metal product | 28 | 11.9 | 11.1 | 12.6 |
| Manufacture of machinery and equipment n.e.c. | 29 | 15.7 | 16.9 | 15.8 |
| Manufacture of office machinery and computers | 30 | 0.0 | 0.0 | 0.0 |
| Manufacture of electrical machinery and apparatus n.e.c. | 31 | 34.7 | 32.7 | 35.3 |
| Manufacture of radio, television and communication equipment | 32 | 45.4 | 48.5 | 48.4 |
| Manufacture of medical, precision and optical instruments, watches and clocks | 33 | 14.0 | 11.4 | 6.8 |
| Manufacture of motor vehicles, trailers and semi-trailers | 34 | 47.2 | 50.3 | 46.8 |
| Manufacture of other transport equipment | 35 | 4.5 | 4.4 | 6.4 |
| Manufacture of furniture; manufacturing n.e.c. | 36 | 7.6 | 7.1 | 8.3 |
| Recycling | 37 | 17.2 | 0.0 | 0.0 |
| **E - ELECTRUCITY, GAS and SUPPLY** | | | | |
| Electricity, gas, steam and hot water supply | 40 | 7.9 | 6.3 | 6.2 |
| Collection, purification and distribution of water | 41 | 0.5 | 0.0 | 0.5 |
| **F - CONSTRUCTION** | 45 | 2.9 | 3.0 | 3.5 |
| **G - WHOLESALE and RETAIL TRADE** | | | | |
| Sale, maintenance and repair of motor vehicles and motorcycles | 50 | 12.8 | 10.9 | 12.2 |
| Wholesale trade and commission trade | 51 | 26.5 | 30.0 | 32.0 |
| Retail trade, except of motor vehicles and motorcycles | 52 | 15.5 | 13.2 | 17.2 |
| **H - HOTELS and RESTAURANTS** | 55 | 10.6 | 9.0 | 11.1 |
| **I - TRANSPORT, STORAGE and COMMUNICATION** | | | | |
| Land transport; transport via pipelines | 60 | 8.1 | 6.3 | 11.3 |
| Water transport | 61 | 10.6 | 14.9 | 16.7 |
| Air transport | 62 | 0.6 | 0.0 | 0.2 |
| Supporting and auxiliary transport activities; activities of travel agencies | 63 | 14.5 | 13.8 | 16.2 |
| Post and telecommunications | 64 | 44.7 | 43.3 | 41.7 |
| **K - REAL ESTATE, RENTING and BUSINESS ACTIVITIES** | | | | |
| Real estate activities | 70 | 13.8 | 6.7 | 7.0 |
| Renting of machinery and equipment | 71 | 27.9 | 17.4 | 17.2 |
| Computer and related activities | 72 | 29.2 | 23.5 | 34.8 |
| Research and development | 73 | 6.9 | 6.3 | 11.7 |
| Research and development | 74 | 13.9 | 13.1 | 9.6 |
| **M - EDUCATION** | 80 | 0.9 | 0.7 | 0.8 |
| **N - HEALTH and SOCIAL WORK** | 85 | 1.9 | 1.6 | 1.8 |
| **O - OTHER COMMUNITY, SOCIAL and PERSONAL SERVICE ACTIVITIES** | | | | |
| Sewage and refuse disposal, sanitation and similar activities | 90 | 0.0 | 0.1 | 1.2 |
| Recreational, cultural and sporting activities | 92 | 6.7 | 7.5 | 9.3 |
| Other service activities | 93 | 0.0 | 0.0 | 0.0 |

*Source:* Calculation by TUIK based on the Annual Industry and Service Statistics data.

# Chapter 5 : Foreign Aid Flows and Entrepreneurship: An Empirical Assessment across Developing Countries

## 5.1. Introduction

Developing countries absorbed more than half of the global FDI inflows in 2012 and 2013[103] (UNCTAD/WIR, 2014). This aggregate picture, however, veils the considerable diversity of FDI patterns prompted by variations in host countries' capacity to attract private investment. For example, 70% of FDI to developing countries in 2012 was directed to two regions (Asia and Latin America) and concentrated in fifteen economies[104] leaving Africa's share at 4.1%. Similarly, only 8% of inward FDI stock is held by African countries in 2012 (all data from UNCTAD/WIR, 2014). FDI favours countries with satisfactory conditions in terms of infrastructure, human capital, and economic, social and political environment (Navaretti and Venables, 2004). Lacking access to FDI due to their high-risk environment, many developing countries, especially in Africa, rely on foreign aid as an alternative source of external finance to fund activities leading to sustained economic development. To exemplify, in Africa in 2012, foreign aid as a percentage of gross national income (GNI) ranges from 0.03% in Algeria to 36.1% in Liberia with an average of 7.6% for the continent as a whole (WB/WDI).[105] The fact that aid compensates for the shortage of FDI is also recognized by the leading donor institutions. For example, Monterrey Consensus on International Financing for Development organized by the UN explicitly states that "ODA (official development assistance)[106] plays an essential role as a complement to other sources of financing for development, especially in those countries with the least capacity to attract private direct investment" (UN, 2003, p: 14).[107]

Since its origin at the end of World War II, foreign aid went through major changes in terms of its goals and objectives. In the 1950s and 1960s, the role of foreign aid was to relieve the deficiencies of domestic savings and foreign exchange which are identified as

[103] FDI to developing economies accounts for 54.8% and 53.6% of global inflows in 2012 and 2013 respectively.

[104] These countries are China, South Korea, Indonesia, Malaysia, Singapore, Thailand, India, Saudi Arabia, Turkey, Argentina, Brazil, Chile, Colombia, Peru and Mexico.

[105] Data is available via the World Bank's (WB) World Developent Indicators (WDI) database (Retrieved on January, 07 2015): data.worldbank.org/indicator/DT.ODA.ODAT.GN.ZS

[106] Foreign aid and official development assistance are used interchangeably in literature and practise.

[107] The idea that foreign aid, to some degree, complements or substitutes FDI has been a topic pursued in a number of studies. Theoretically, three main arguments are proposed in support of the complementary hypothesis which states that aid crowds in FDI. First, the 'infrastructure effect' may exist through which aid strengthens physical and social infrastructure in receiving countries. Second, the 'financing effect' may take place as aid eases fiscal constraints on profit repatriation from FDI. Third, the 'vanguard effect' might be at work whereby foreign aid from a particular donor country accompanies FDI from the same donor but not from others. On the other hand, the supplementary hypothesis which states that aid crowds out FDI is founded on two main arguments. First, the provision of aid may lead to rent-seeking activities, and thereby eroding incentives for investing in productive activities. Second, the "Dutch-disease effect" of aid may displace the allocation of resources from tradable to non-tradable sectors. Nonetheless, previous studies generally fail to find a direct relation between foreign aid and investment but significant effects of aid are found to be conditional on the use of interaction terms (e.g., Harms and Lutz, 2006; Karakaplan et al., 2005), disaggregation of aid into sectoral categories (e.g., Kimura and Todo, 2010) and the specific donor countries taken into account (e.g., Selaya and Sunesen, 2012).

potentially limiting factors on growth. The 1970s witnessed a greater focus on poverty reduction through direct interventions including rural development programs (e.g., food for the malnourished, water supply and sanitation, adult literacy campaigns and credit provision for small farmers). During the following two decades, pro-market reforms were seen as solutions to lagging growth and poverty alleviation in aid-recipient countries where structural adjustment programs and aid conditionality[108] were launched involving deregulation, privatization of national services, trade liberalization and financial opening.

After the acknowledged failure of these one-size-fits-all neo-liberal approaches, from the 2000s onwards, a shift towards private sector development (PSD) took place (Nelson, 2011; OECD/DAC, 2006; UNDP, 2004; World Bank, 2001, 2005). Rather than being a marked shift as in the previous decades, the emphasis on the role of foreign aid in unleashing entrepreneurship in low-income countries can be seen as an extension of the earlier pro-market moves. Recognizing that countries differ from one another; this new focus provides sufficient flexibility to match donors' intentions to the country-specific needs holding back PSD. To address the impediments in various areas, poor countries receive $21 billion in foreign aid per year, on average, for activities supporting PSD (World Bank, 2005). Specifically, during the period 2004-2010 European Commission (EC) disbursed a total of €2.4 billion of funds for the same purpose.[109] Likewise, the United States Agency for International Development (USAID)—a leading donor aligned its aid programs accordingly and designed new ones aiming at PSD whereby a value of more than $20 billion was released since 2001.[110] The question then arises whether this policy shift has any real impact on entrepreneurial endeavours in aid-receiving countries? This is the main question addressed in this chapter.

On a general level, the motivation of our empirical pursuit is to initiate a discussion and draw attention to the need for more research on the effectiveness of foreign aid in stimulating entrepreneurship. Given the high priority placed on the foreign aid-entrepreneurship nexus, it is surprising that there is a paucity of analysis at the aggregate level. Empirical scrutiny of this kind is crucial in deriving generalizable conclusions, and in the guidance of policy makers towards formulating more evidence-based policy responses. During the various shifts in the objectives of foreign aid over the previous decades, we generally witness a balanced blend of research and policy initiatives. The results of academic research focusing on aid effectiveness along different dimensions fed into policy design, implementation and evaluation which in turn generated further research questions. This process repeats itself until a new focus on the role of foreign aid in development emerges, and it begins anew. For instance, once the policy suggestion that aid helps countries to close the savings-investment gap is not substantiated by empirical evidence, alternative paths of research are opened up. Likewise, policy and research arena in the late 1990s and early 2000s are highly influenced by the results of Burnside and Dollar (2000) who concluded that aid spurs economic growth provided that recipient countries implement good macroeconomic policies. It would be fair to say that such a mutual dependence of research and policy efforts is largely absent in the current debate on entrepreneurship in relation to aid effectiveness. Most of the available written material is in the form of policy papers discussing strategies and roadmaps on how to utilize aid

[108] Aid conditionality refers to a set of obligations (imposed by donors) that aid-recipient countries need to fulfil (e.g., the privatization of state-owned enterprises) prior to the disbursement of aid flows.

[109] Details on the use of the funds can be found in the evaluation report published by the EC. Information retrieved on February, 07 2015 from:
http://ec.europa.eu/europeaid/how/evaluation/evaluation_reports/reports/2013/1317_vol1_en.pdf

[110] More information is available on the website of the USAID. Retrieved on February, 07 2015 from: http://www.usaid.gov/gda

effectively to support new business activities. Despite the voluminous policy documents, research efforts are limited to impact evaluation studies at the project or program level. However, given the heterogeneous nature of these programs, it is hard to make generalizations based on the findings of such studies. Impact evaluations ensure high internal validity, but provide limited external validity. To the best of our knowledge, no study has conducted an aggregate analysis relating foreign aid to entrepreneurial activities in recipient countries on a cross-country basis. A study of this kind is necessary to be able to draw inferences applicable to different settings and to develop policy recommendations that will complement existing strategy documents. Furthermore, this study disaggregates foreign aid flows by purpose, an empirical practice which has received scant attention in the literature. Drawing such a distinction allows us to trace and compare the potential effects of categorical aid on new business activity. Specifically, we separate out foreign aid flows supporting education, infrastructure and institutional reforms.

The prevailing argument in policy papers is that entrepreneurship provides the missing link between foreign aid and economic growth. With poverty alleviation being the main development goal, the consensus has been that equitable and sustained growth is essential to realize this outcome. In turn, economic growth is best achieved through the private sector (OECD/DAC, 2007), which needs to be adequately promoted. A vibrant private sector, among others, drives innovation, improves productivity, fosters new investment, contributes to self-regulating markets, expands job opportunities leading to rising wages, and augments tax revenues to fund public services and social programs and subsequently ameliorates poverty (Parker, 2004).

Accordingly, donor countries and institutions initiate and support a wide array of interventions aiming at PSD in aid-receiving countries. In reviewing existing programs, Schulpen and Gibbon (2002) classify them into macro, meso and micro level interventions depending on the field in which they are applied. Kindornay and Reilly-King (2013) provide a similar breakdown. At the macro level, the concern is to create and improve a 'business-enabling environment' through all-embracing economic, legal and regulatory reforms including physical infrastructure, trade and privatization policies, human capital, governance framework, property rights, financial regulations, etc., to guarantee the right mix of policies and instruments prevail for tapping entrepreneurial spirit. Meso level interventions are those attempting to eliminate market failures and imperfections through, for example, the provision of finance and transfer of technological innovations. A further aim is to enhance the synergy and coordination between various actors such as chamber of commerce, labour unions, employer organizations and training institutions, etc., where responsibilities and duties are clearly defined, and policy ownership among these partners is enhanced. Finally, at the micro level, direct assistance is given to businesses to upgrade their technical and managerial capacities to ensure healthy and sustained firm growth. Likewise, individuals equipped with an entrepreneurial idea but lack specific skills and knowledge about the market also benefit from micro-level donor interventions.

Donors differ considerably in the weight they attach to different means of support. For example, while the World Bank prioritizes modalities facilitating the 'business-enabling environment' through policies, laws and regulations at the macro level, the European Commission devotes comparatively more resources to micro-level interventions (Kindornay and Reilly-King, 2013). Within the donor community broadly, the tendency is to gradually refrain from firm-specific assistances as selective interventions may distort market forces rather than help them operate more efficiently by favouring individual firms more than others. Strengthening the business environment, however, benefits all firms regardless of size, form of organization or industry (Kindornay and Reilly-King, 2013; Kurokawa et al., 2008).

Within the wider PSD field, two strands of literature are of particular relevance to this study, one focusing on the impact of foreign aid on the trade performance of the receipt countries, and the other looking at the effects on privatization. With regard to the former, aid is expected to induce greater trade flows as until the late 1990s the disbursement of the majority of foreign aid is conditioned to trade which required the purchase of goods and services from firms in donor countries (Wagner, 2003). Perhaps, a more coherent view with the donor interventions discussed above is that a positive trade-aid relationship may also be observed due to advancements in the trading capacity of receipt countries following the use foreign aid in trade facilitation activities such as improving customs procedure and building infrastructure (Suwa-Eisenmann and Verdier, 2007). These theoretical perspectives have often found empirical support. While earlier studies predominantly attribute the affirmative association between foreign aid and trade to the conditionality issue (e.g., Lloyd et al., 2000; Nilsson, 1998; Osei et al., 2004; Wagner, 2003), more recent work bases their conclusions on the amelioration of the countries' internal constraints to trade through targeted foreign aid allocations (e.g., Calì and te Velde, 2011; Helble et al., 2012; Hühne et al., 2014; Vijil and Wagner, 2012).[111] There are also studies linking foreign aid and privatization of publicly-owned enterprises in aid-receiving countries, with inconclusive results (e.g., Banerjee and Rondinelli, 2003; Hemming and Unnithan, 1996).

One reasonable inference from both sets of literature is that foreign aid benefits, if any, the wider economy through its impact on existing firms rather than new entrants. First, if aid leads developing countries to export more, as the aforementioned studies using aggregate data suggest, the likely source of this augmented trade tends to be incumbents with complementary capabilities facilitating access to new markets. Exporter firms are often larger in size, older and more productive compared to non-exporters. These attributes are less likely to stand out in new entrants to a given industry offering limited potential for an export expansion. Confirming this perspective, a firm-level study carried out using Tunisian data shows that the average age of the sample firms whose export activities are partly subsidized through a foreign aid programme is 20.4 years with 83% of them having previous export experience (Gourdon et al., 2011). Second, the motivation of foreign aid in facilitating privatization of economic entities under government ownership is generally to make them operate more efficiently and to be profitable. Once again, the expected economy-wide gains from these reforms originate from existing establishments changing hands from public to private rather than from new entrants.

As indicated the complementary but underexplored area of research is the way in which foreign aid is related to new business activity, or entrepreneurship, in recipient countries. An interesting case study is Kurokawa et al., (2008), which extensively evaluates the performance of the Japanese development agency's 'One Village One Product' (OVOP) program in helping poor entrepreneurs through the exploitation of niche markets. Other works focusing on the assessment of individual aid programs supporting entrepreneurship include Zweig (2000) with a focus on China. Completing and extending these micro-oriented studies, in this chapter, we adopt an aggregate view, and investigate to what extent entrepreneurial activities are influenced by foreign aid inflows in aid-receiving countries. This perspective is especially important, given the wide diversity of aid programs aimed at nurturing the entrepreneurial capacity of the poor. Subsequently, we also disaggregate total aid flows by disbursement purposes. Specifically, we assess whether purpose-specific aid flows directed at activities supporting education, physical

[111] For a relatively recent survey of the literature, see Suwa-Eisenmann and Verdier (2007).

infrastructure and institutional reforms have an effect on the level of entrepreneurship in aid-receiving countries.

Our results are threefold. First, higher levels of foreign aid coincide with increased entrepreneurial activity, and this significant effect is substantiated by a set of robustness checks. Estimates based on one-, two- and three-year lag lengths are essentially indistinguishable. Second, while a positive association running from aid supporting physical infrastructure to entrepreneurship is detected, the effects of aid flows targeting education and institutional practises are not significantly different from zero. Yet, the positive effect of physical infrastructure is found to be sensitive to a variety of model specifications, and to the choice of the dependent variable. Finally, once all purpose-specific aid categories are taken into account we find that aid flows channelled for the provision of basic needs (e.g., basic health and education) and for the assurance of an adequate level of human security both in times of disaster and conflict are the main forces behind increases in entrepreneurship.

The remainder of this chapter is organized as follows. Section 5.2 touches briefly on the studies linking foreign aid and economic growth which account for the majority of literature on aid effectiveness. A review of literature provides a background for the present study. In section 5.3, we develop testable hypotheses on the aid-entrepreneurship link. While section 5.4 presents data, variables and methodology, section 5.5 discusses the results. Finally, section 5.6 concludes and summarizes the main findings.

## 5.2. Foreign Aid and Economic Growth

How much economic growth in developing countries is attributable to foreign aid inflows is a longstanding question that has yielded fragile and ambiguous results (Rajan and Subramanian, 2008). The literature mainly consists of cross-country growth specifications whereby the aid-growth link is assessed from different perspectives. Early literature is largely influenced by the Harrod-Domar model which implies that the lack of capital accumulation is the main barrier to economic progress. Under this perspective, aid flows are assumed to expand countries' capacity to close the savings-investment gap, and subsequently contribute to the accumulation of capital. More precisely, aid is seen as an exogenous net increment to the capital stock in receipt countries.

Papanek (1973), Mosley (1980) and Mosley et al., (1987) constitute the central studies during the early wave of foreign aid literature. Abandoning the prevailing standard of the time, Papanek (1973) is the first to isolate the effects of foreign aid on growth from those of foreign investment and other inflows. The author shows that aid significantly increases economic growth with disproportionately higher rates in Asian countries. Mosley's (1980) analysis is unique due to the introduction of lagged aid variables into the models and consideration of the potential endogeneity of aid with respect to growth. Mosley et al., (1987) improve on the past estimation approaches by using a simultaneous equation system. The results of these last two studies contrast sharply with those obtained Papanek (1973) with being statistically insignificant for different sub-periods and samples of developing countries. Boone (1994, 1996) argues that foreign aid does not lead to higher investment as opposed to what was expected. In contrast, it supports government consumption, and hence the undetected growth impact of aid is reasonable.

Boone (1994, 1996) stimulated a new stream of literature evolving around foreign aid, policies and growth. The main concern is not to resolve the question of whether aid works or not, rather to identify under which conditions foreign aid has a favourable impact on economic progress. Burnside and Dollar's (2000) very influential study concludes that

foreign aid helps poor countries to grow, provided that good macroeconomic policies are in place. The policy index is a weighted composite of inflation rate, budget surplus (deficit) as a percentage of GDP and the Sachs-Warner openness indicator (see, Sachs and Warner, 1995). These subcomponents are assumed to account for the conduct of monetary, fiscal and trade policies, respectively. Some studies corroborate[112] with their finding whereas many others cast serious doubt on its validity. Most notably, revisiting the same dataset, Easterly (2003), Easterly et al., (2004) and Roodman (2007) show that the conclusion of aid raises growth in good policy environment is fragile to updated data, to the choice of foreign aid and policy measures as well as a set of specification tests.

There is also a collection of studies evolving around the idea that foreign aid contributes favourably to economic growth but with a threshold level beyond which effects are reversed. Put differently, aid is subject to diminishing returns. For example, Hadjimichael et al., (1995) show a turning point of approximately 25% of GDP at which aid has a negative marginal impact on growth in Sub-Saharan African countries. The authors draw attention to the lack of absorptive capacity of the sample countries to justify this finding. Durbarry et al., (1998) and Lensink and White (2001) report[113] comparable results for expanded sample of countries where Dutch disease effects and institutional decay together with the use of inappropriate technology are seen as reasons of diminishing returns to aid. The threshold levels of aid to GDP revealed in these studies are 51% and 50%, respectively.

Another strand of research recognizes the role of other external conditions, instead of the widespread emphasis on policy environment, in driving aid effectiveness on growth. To begin with, Guillaumont and Chauvet (2001) find that the impact of aid on growth depends on the economic vulnerability of recipients. More specifically, countries confronted with the most adverse external conditions with regard to terms of trade, export shocks and natural disasters benefit more from aid flows. A reasonable explanation is that aid mitigates the negative consequences of external disturbances. Similarly, Dalgaard et al., (2004) show that aid is more effective in raising the income level in countries outside tropical regions, whereas the opposite prevails in countries within the tropics. This result is grounded on the potential influence of tropical diseases on growth along with the role of geographical conditions in economic progress transmitted through their indirect effects on institutional arrangements. Islam (2005) demonstrates that foreign aid acts as a catalyst for growth growth in politically stable environments. Finally, Lensink and Morrissey (2000) consider the issue of aid volatility which is defined as the discrepancy between actual aid disbursements and committed inflows. Results suggest that aid contributes to growth, but its positive impact fades away when the volatility of aid increases.

Askarov and Doucouliagos (2015) differ from past works in that the authors focus on a subset of countries, i.e., economies in transition to assess aid effectiveness on growth.

[112] First, Collier and Dehn (2001) extend the dataset of Burnside and Dollar (2000) by including variables on export price shocks, and confirm the result that aid positively affects growth in countries with good policies. It is further shown that increased aid flows counterbalance the adverse effects of export shocks on growth. Second, compared to the original data, Collier and Dollar (2002) use alternative measures of foreign aid and policies, employ a different set of control variables, include a few new countries and focus on a different time span. The results still lend support to Burnside and Dollar (2000). Finally, Collier and Hoeffler (2004) show that aid encourages growth particularly in countries that are in post-civil war period and that have good policies. Studies contradicting the results of Burnside and Dollar (2000) include Hansen and Tarp (2001), Lensink and White (2001), Dalgaard and Hansen (2001), Hudson and Mosley (2001), Ram (2004) and Jensen and Paldam (2006).

[113] Other studies confirming diminishing returns to aid include Dalgaard and Hansen (2001), Hansen and Tarp, (2000, 2001) and Dalgaard et al., (2004).

For this group of countries, increases in aid flows are, on average, associated with higher income growth, with no significant differences across bilateral and multilateral aid flows. Furthermore, no evidence is detected to suggest that aid is more effective within a supportive policy environment. The same conclusion also applies to the hypothesis that aid is subject to diminishing returns.

Clemens et al., (2012) argue that not all types of foreign aid are growth-enhancing and those that are (e.g., budget support, program aid and project aid) should be included into the estimation models with appropriate lag structures. The authors apply the proposed method to the original datasets of three influential studies[114] which produced contradictory results. After these alterations, the disagreement seems to disappear, and the findings suggest that foreign aid flows were followed by small increases in economic growth.

Using an extended sample of developing countries, Rajan and Subramanian (2008), (an all-inclusive study), combine multiple dimensions of the aid-growth nexus in the same framework. Prevailing results are in sharp contrast to those of the aforementioned studies. First, authors fail to establish a robust link between foreign aid and growth. Second, there is no evidence to support the view that aid works better when good policies are in place, that aid is subject to diminishing returns, that the type of aid matters (bilateral vs. multilateral), and that external conditions determine aid effectiveness on growth. In a series of meta-analysis studies Doucouliagos and Paldam (2008, 2009, 2011), surveying four decades of literature, indicate that the effect of foreign aid on growth is, on average, positive but small, insignificant and has a tendency to get smaller over time. Another survey study, (Hansen and Tarp, 2000, p: 375), however, leads to a more optimistic conclusion by stating "… a coherent and positive picture of the aid-growth link emerges" from the assessment of the literature. It seems that the diversity in the results becomes the norm rather than the exception which necessitates more empirical work in this direction.

## 5.3. Testable Hypotheses: Foreign Aid and Domestic Entrepreneurship

Reflecting on the literature, a well-established observation is that the rates of entrepreneurship vary across countries and time. These differences, in part, reflect the extent to which environmental factors are conducive or hostile to private sector development. Baumol (1990) argues that the allocation of entrepreneurial talent across productive ends is highly influenced by external conditions. Likewise, the OECD/DAC recognizes that "an efficient and hospitable environment is a prerequisite for business investment, transactions and management" (OECD/DAC, 1995, p: 12). This comprises well-working legal institutions (e.g., rule of law and property rights), low levels of corruption, functioning markets, skilled labour force, supportive physical and social infrastructure, and the provision of necessary training, advice and support services. To address constraints in various areas and to create a level playing field, multi-billion dollar aid packages are mobilized on a variety of entrepreneurship-enhancing activities over several years, in a large number of developing countries. At the initial stages of development, specifically, improvements in basic requirements including physical infrastructure, education (both general and vocational) and institutional arrangements are of crucial importance (Kelley et al., 2011; OECD/DAC, 2006). Donor efforts in these three aid categories form the basis of our attention. In what follows, specific hypotheses are developed on the relationship between purpose-specific aid flows and domestic entrepreneurship.

[114] These studies are Boone (1996), Burnside and Dollar (2000) and Rajan and Subramanian (2008).

### 5.3.1. Education

Considerable foreign aid is put into educational efforts in an attempt to unleash entrepreneurship in poor countries. This approach is buttressed by the widespread consensus among policymakers that entrepreneurship, at least some of its facets, can be taught. It is advocated that entrepreneurial behaviour is not an intrinsic personal trait, and can develop, evolve and change over time with the appropriate support (Kuratko, 2005). Realizations of entrepreneurial drive, as reflected in starting, running and expanding a new business, may not materialize due to knowledge gaps about market conditions and developments (Graevenitz, 2010). Similarly, if corrective measures are not undertaken, people who lack technical and business skills may experience higher failure rates at later stages of business development.

In contrast, entrepreneurial activities are taken to be exogenous to the system by others, leaving little space for entrepreneurship-targeting policies. According to this perspective, entrepreneurs are endowed with a collection of distinct characteristics that are fixed, inborn and enduring, manifesting themselves in entrepreneurial behaviour. These unique traits are assumed not to change, and are consistent across time and context (Cope, 2005). A logical extension of this pathway is that due to their innate nature, entrepreneurial characteristics cannot be acquired through education and training or professional experience (Haase and Lautenschläger, 2011). The assertion that entrepreneurs 'are born, not made' represents the conventional wisdom of the proponents of this view. Spurred by the ambiguities in theoretical grounds on whether entrepreneurship can be taught or not, a voluminous empirical literature has emerged to address this question where little consensus exists.

Van der Sluis et al., (2008), offering a meta-analysis of more than a hundred of papers focusing on developed countries, suggest that the association between general education– measured by years of formal schooling and starting a business is generally found to be insignificant (in 75% of all the studies). The same study, however, also reports that education positively affects entrepreneurial performance in terms of income generation, survival, profit and firm growth (in 67% of all the studies). With a focus on developing countries only, the meta-analysis by Van der Sluis et al., (2005) draws a similar conclusion that a positive link between attaining a general level of education and setting up a business remains unproven. Nonetheless, entrepreneurs with more years of formal schooling earn higher returns. In a more recent meta-analysis where the emphasis is on entrepreneurship education rather than general schooling, Martin et al., (2013) show that the provision of targeted training programs is positively associated with entrepreneurial outcomes, such as firm survival and growth rates. Dickson et al., (2008) combine both approaches, and systematically review empirical studies on the effects of general and entrepreneurship education on selection into business ownership and post-entry performance. They conclude that while general education seems to matter most for entrepreneurial success subsequent to firm formation, this is less so for the decision-making process regarding becoming an entrepreneur, whereas specific training programs are positively related to both outcomes.

It is also of interest to mention a few noteworthy individual studies. For example, Klinger and Schündeln (2011) find that participation in an entrepreneurship training program leads more individuals to start their own business or to expand an existing venture in El Salvador, Guatemala and Peru. On the other hand, Karlan and Valdivia (2011) report little or no evidence of an entrepreneurial training effect on a variety of performance indicators of individuals who received microcredit to start their own business in Peru. One reasonable explanation for the divergent findings is that individual education and training

programs vary widely amongst the target participants, the means they use, the objectives to be attained, skills and capacities that are addressed. The timing of the impact assessment is also an important element, and evaluations undertaken too early may underestimate the true contribution of the program against its stated goals.

### 5.3.2. Physical Infrastructure

Rates of entrepreneurial activities are not independent of infrastructure development. Poor infrastructure constitutes one of the major bottlenecks holding back private sector development in developing countries (Holl, 2004). The notion of infrastructure includes elements such as transportation networks, communication facilities and energy supply systems (Capello and Nijkamp, 2009). Modern infrastructure facilities lower the cost of input factors, and therefore countries with better physical infrastructures experience higher rates of entrepreneurship (Holl, 2004). Firms may be established in a specific area to benefit from more productive and less expensive infrastructure services, such as access to an advanced telecommunication network. Accordingly, since low-priced and highly reliable electricity decreases production costs in manufacturing, better and cheaper provision of this service stimulates the creation of manufacturing ventures (Hulten et al., 2006). Enhancement in water infrastructure is crucial in reducing the cost of irrigation, nurturing agriculture-related businesses. In turn, countries may benefit from increased employment and other welfare effects of entrepreneurship that are partly stimulated by a developed infrastructure. Empirical evidence supporting positive impacts of sound physical infrastructure on development outcomes including the private sector is vast and informative (Calderón and Serven, 2004; Esfahani and Ramìrez, 2002; Estache, 2003; Hulten et al., 2006).

### 5.3.3. Institutions

New institutional economics argues that human behaviour is shaped by the institutional context (North, 1990; Williamson, 2000). Economic agents decide on their course of action under uncertainty. Uncertainty, in turn, can be reduced through formal rules and informal norms–the fundamentals of institutions–that make human actions more predictable. According to North (1990, p: 77),

> *"Discovering markets, evaluating markets and techniques, and managing employees do not occur in a vacuum…The kind of information and knowledge required by the entrepreneur are in good part a consequence of a particular institutional context."*

The fact that institutions act both as constraints to, and enablers of, business activities is recognized in the literature. Higher entrepreneurship rates require a stable legal environment. Well-defined property rights and the rule of law are vital components of an institutional structure that encourages entrepreneurship (e.g., Aidis et al., 2012; Klapper et al., 2006). When entrepreneurs are assured that their interests are protected against expropriation and corruption through formal rules; their incentives to invest in productive activities are boosted (Baumol, 1993). Potential business founders must feel confident that their entrepreneurial efforts will not be ruined through a corrupt system so that long-term business plans become feasible. The better the quality of prevailing institutions is, the greater the reduction in the cost of doing business (Williamson, 1998). Government policies are fundamentally linked to prevailing institutional structures. Institutions, and thus the policies that shape and are shaped by them, define the room for entrepreneurial

actions. With that in mind, large sums of foreign aid flow into poor countries to policy reforms aimed at improving the local institutional framework which is expected to contribute to entrepreneurial development.

### 5.3.4. Aid Fungibility

One issue that arises when separate aid categories are considered is fungibility. Fungibility refers to the diversion of foreign aid flows to alternative purposes from previously agreed-upon targets. For instance, assume that a certain amount of foreign aid is released to be used in the construction of a hospital. From the donor perspective, this flow is seen as an additive resource transfer to the existing level of health expenditures of the recipient country. However, if the local government would have built the hospital anyway with own revenues in the absence aid, then the ramification is that the additional aid flows relax the government's budgetary constraint such that aid is spent on other items. At the end of the day, while the hospital may still be constructed, aid is used to substitute not to complement the overall health spending against the wishes of the donors.

The fungibility problem is more pronounced when donors and recipient countries have divergent preferences over the allocation of aid for various uses. If the government treats aid flows as a pure supplement to domestic resources to conform to its budget allocation preferences regardless of donor intentions, the fungibility of aid is likely. In the case of perfect alignment between aid receivers and donors, fungibility is less of an issue, and targeted aid flows even may not be required. Rather donors can provide lump sum budgetary support to finance various expenditure categories whose levels are determined by the recipient country. However, in practice, such incidents are hard to come by and some degree of fungibility is expected. One solution would be to monitor the governments' spending patterns of purpose-specific aid flows. The multiplicity of donors in a given recipient country and the wide range of aid receivers that a specific donor engages with could result in coordination problems, and the monitoring can be prohibitively costly to implement. Therefore, in most cases, the distribution of foreign aid into various categories is left to the discretionary behaviour of the administrative bodies in recipient countries.

Feyzioğlu et al., (1998) suggest that, in the presence of fungibility, the assessment of categorical aid flows in relation to development outcomes (in our case entrepreneurship) may be biased as one cannot be sure if the recipient country actually spent it on the focused area. A workable alternative would be to relate aggregate aid flows a country receives in a given year to the prevalence of entrepreneurial activities in the same country. The downside is that this approach does not provide insight into the role of individual aid components rather the effectiveness of combined aid is gauged. This perspective further supposes that, aid is fungible, if any, across categories targeted by aid flows. For instance, educational aid may be used to fund physical infrastructure projects. Similarly, foreign aid earmarked for health care may be diverted to improve educational outcomes. The list of possible combinations of fungibility is endless, but we just want to illustrate the basics. Supporting our premise, the redirection of categorical aid among themselves has been the topic of previous studies (e.g., Pack and Pack, 1990, 1993; Swaroop et al., 2000).

One concern often noted in earlier studies on fungibility is that the alternative use of purpose-specific aid is less productive than prearranged ones (Devarajan and Swaroop, 2000). With the availability of more and better quality data, however, more recent work supports the view that detecting fungibility should not be equated with the inefficient use of aid. For example, Pettersson (2007) reveals that sectoral foreign aid fungibility plays no role in the effectiveness of aid on economic growth. Similarly, Dreher et al., (2008) report that while educational aid is largely fungible, aid in this category is positively associated

with net school enrolment ratio. The notion that fungibility is intrinsically unfavourable is not self-evident. It rather hinges on the eventual use of aid flows. There is a good deal of cohesion between donors and aid recipient countries on needy areas requiring support. Undeniably, both sides would favour the construction of a primary school or family planning centre. However, priorities of donors amount to only a subset of overall government expenditures. Instead of funding schools, recipient countries can also direct aid flows to debt repayment[115], deficit reduction, tax relief and –perhaps the most unproductive category– military spending. Svensson (2000) also argues that foreign aid is a potential source of rents as it is distributed for free or in concessional terms to the officials in developing countries who have considerable discretion over its allocation and use. As such aid is a ready-made target for corruption. On balance, while the fungibility of purpose-specific aid flows toward military spending and rent-seeking activities can inherently be seen as undesirable, we believe that the diversion of flows across development-oriented categories (e.g., from education to health, from food aid to the vaccination of children, from transportation to communication facilities) cannot be treated as ex ante bad.

While acknowledging the switching of aid occurs to substitute both desirable and undesirable spending concurrently, and the impacts may be significant, in this paper, we abstract from the latter possibility to keep the analysis simple and in perspective. That is, our focus first is to investigate the effect of aggregate aid flows on domestic entrepreneurship with the aim being to account for fungibility across various aid categories. Second, we are interested in the identification of the links between aid into education, physical infrastructure and institutional practices and entrepreneurship. Previous studies are indicative on the degree of fungibility in the aid categories of our interest which offer contradictory results. For instance, while Feyzioğlu et al., (1998), in a cross-country sample, show that aid to energy, transport and communication sectors (subcomponents of the physical infrastructure category) are not diverted; aid to the education category is substantially switched to other uses. The authors argue that aid flows given to physical infrastructure projects are characterized by lump sum resource transfers. Hence, they are easy to monitor leaving little room for fungibility. In contrast, drawing on a sample of Sub-Saharan African countries, Devarajan et al., (1999) found the exact opposite results of those reported in Feyzioğlu et al., (1998). While both studies disagree on fungible aid categories, their results demonstrate the need for taking potential fungibility into account which is tackled through the use of aggregate aid flows in our analysis.

More specifically, in the light of (relatively) positive past experience of aid effectiveness on economic growth, we formulate the following hypotheses on the relationship between foreign aid and domestic entrepreneurship in recipient countries:

**Hypothesis 1:** *Higher levels of foreign aid are positively associated with entrepreneurship.*

**Hypothesis 2a:** *Higher levels of foreign aid in education are positively associated with entrepreneurship.*

**Hypothesis 2b:** *Higher levels of foreign aid in physical infrastructure are positively associated with entrepreneurship.*

[115] The vast majority of studies on aid fungibility are built on the assumption that aid flows first enter to the budget of the recipient government, and are subsequently allocated to the respective uses. Hence this approach neglects the portion of foreign aid bypassing the government budget. Van de Sijpe (2013) addresses this shortcoming and extends the literature by considering the fungibility of both on- and off-budget foreign aid.

**Hypothesis 2c:** *Higher levels of foreign aid in institutional practices are positively associated with entrepreneurship.*

## 5.4. Data and Methodology

### 5.4.1. Data and Variables

Individual country registries keep track of business activities, but collecting harmonized data on entrepreneurship is difficult due to variations across definitions and measurement. Lack of cross-country data has imposed a limitation on the expansion of the entrepreneurship literature (Carree and Thurik, 2003). The Global Entrepreneurship Monitor (GEM) is a survey-based study that provides comparable cross-country data on measures of entrepreneurship. In this regard, the GEM dataset is unique, being the product of the only research initiative that provides a consistent cross-country set of measures of entrepreneurship on a longitudinal basis.

GEM annual surveys use representative samples of randomly selected adults, with a sample size of at least 2000 individuals per country. Since survey samples are derived from the working-age population, all country samples include both entrepreneurs and non-entrepreneurs. A key strength of GEM is that the measures of entrepreneurial activity are at the individual level. In this study, we employ total early-stage entrepreneurship rate from the GEM project as our dependent variable. It is defined as the proportion of the adult population currently active in establishing a business or being owner-manager of a venture that is in operation for less than 42 months. The GEM dataset covers the time period between 2003 and 2013. However, additions and eliminations of the sample countries occur in each wave of the survey, leading to an unbalanced panel.

To construct our independent variables, we use data on foreign aid flows reported by the Creditor Reporting System (CRS) of the OECD (2014 version). CRS makes purpose-specific foreign aid data available annually, which offers the opportunity to track which countries foreign aid flows into, and what purposes this aid serves. The broad motivation behind the provision of foreign aid is "the promotion of the economic development and welfare of developing countries."[116]

We employ different versions of the CRS foreign aid measure that reflect a variety of purposes related to entrepreneurship development. Specifically, our foreign aid variables are: i) total foreign aid, ii) foreign aid for education, iii) foreign aid for improving physical infrastructure, and iv) foreign aid for institutional reforms that improve the stability of the investment climate.[117] Aid flows represent disbursements by donors rather than commitments as the former values reflect actual transfers. All foreign aid measures are in constant 2012 dollars, normalized by population which is extracted from the World Bank's (WB) World Development Indicators (WDI) database. Therefore, aid per capita is our unit of analysis. This is consistent with previous studies (e.g., Dalgaard et al., 2004; Chong and Gradstein, 2008; Brückner, 2011). Furthermore, the OECD does not recommend the use of CRS disbursements before 2002 due to the low coverage[118] of the purpose-specific foreign aid flows. Hence, our foreign aid data spans the period running from 2002 to 2012.

[116] More information on the definition and coverage of foreign aid flows is available on the OECD website. (retrieved on February, 22 2015):
www.oecd.org/dac/aidstatistics/officialdevelopmentassistancedefinitionandcoverage.htm

[117] Further details regarding the composition of each foreign aid subcategory are provided in Tables 5-C-1, 5-C-2 and 5-C-3 in the appendix C.

[118] Purpose-specific foreign aid commitments are recorded by the OECD as early as 1970s but it was not until the 1990s that aid disbursements by target category are reported separately. Even then, only a subset of

GEM and foreign aid data, reflecting our dependent and independent variables, are supplemented by a series of control variables that capture alternative determinants of entrepreneurship. First, in the literature, the level of economic development is often included into the estimation models as an important entrepreneurship predictor (e.g., Acs et al., 2008; van Stel et al., 2007). Therefore, GDP per capita is used to control for differences in development across our sample countries. Data on this measure is extracted from the WDI, measured in constant 2005 US dollars.

Second, capital shortage is a constraint for private sector development, preventing entrepreneurs from getting engaged in new business creation (Beck and Demirgüç-Kunt, 2006). The availability of capital is important to boost entrepreneurship. Hence, a control variable measuring the level of financial sector development is added to the analysis. This variable is defined as the fraction of total credit provided by commercial banks and other financial institutions to the private sector relative to GDP. When calculating this measure, the amount of credit given to governments and other public agencies is excluded. Furthermore, credit granted by the central bank is not incorporated into the computation either. Data on this measure is obtained from the WDI.

Third, there is a strand of literature relating the quality of institutions to countries' economic performance on several fronts. An institutional framework that minimizes the risk of predation and that effectively enforces laws and regulations (e.g., property rights and contracts) is seen as a critical factor in nurturing desirable economic behaviour (e.g., investment, production). Empirical evidence suggests that weak institutions are associated with sluggish economic growth (Knack and Keefer, 1995; Mauro, 1995), lower total factor productivity (TFP) (Hall and Jones, 1999), lower TFP growth (Olson et al., 2000) and lower average income (Acemoglu et al., 2001). This study utilizes two institutional variables of which the first is an indicator of regulatory barriers. It is widely acknowledged in the literature that business registration is a bureaucratic procedure that may well require much time that puts extra burden on potential entrepreneurs (Djankov et al., 2002; van Stel et al., 2007). To capture this effect, we use a control variable defined as the total number of days that is needed to register a new business. Data on this measure is derived from the WB's Doing Business database.[119]

Likewise, the prevailing corruption may act as a significant entry barrier for new business activity (Aidis et al., 2012; Anokhin and Schulze, 2009; Campos et al., 2010). Corruption is a serious distortion in the allocation of resources in an economy interfering with the efficient functioning of markets. Rampant corruption is characterized by the increased incentives of individuals to gain personal benefits at the expense of others

donors made disaggregated disbursements data available. The completeness is improved over time and full data coverage from all donors is reached by 2002 which is also the onset year our study. More information on this aspect of the OECD data is available at (retrieved on February, 22 2015):
stats.oecd.org/qwids/about.html

[119] This variable is available since 2004 up until 2015. Missing values for years 2002 onwards are replaced by 2004 data and subsequent years of the business registration variable on a yearly basis. Put differently, for 2002 we use 2004 data, for 2003 we use 2005 data and so on. Following this approach, the final year of our data set, 2012, utilizes business registration information from the year 2014. For Bangladesh, Brazil, China, India, Indonesia, Nigeria, Mexico and Pakistan, two different values of this variable are reported in 2014. These values measure the total number of days required to register a business in the two most prominent cities (e.g., Shanghai and Beijing for China) in each country. The average value represents the country score as a whole. This alteration in data collection is introduced in 2014 for the first time. In the previous years, the country value on this variable originated from a single city (e.g., Shanghai for China). In order to maintain consistency, in 2014, we do not use the average figure but the value coming from a single city on this variable is employed. Namely, Dhaka for Bangladesh, São Paulo for Brazil, Shanghai for China, Mumbai for India, Jakarta for Indonesia, Lagos for Nigeria, Mexico City for Mexico and Karachi for Pakistan.

utilizing authoritative power, political connections and other means of influence. By introducing insecurity and uncertainty into economic transactions, heightened corruption may discourage entrepreneurs from starting a business and making long-term productive investments. Given this possibility, we also control for corruption levels in the analysis. More specifically, the freedom from corruption index which is made available by the Heritage Foundation is used. The scores on this variable are mainly based on the Transparency International's Corruption Perceptions Index (CPI). It measures corruption embedded in the business environment including governmental, legal, judicial and administrative practices. Being the most commonly used metric of its variants, this variable brings the advantage of comprehensive coverage of countries[120] which maximizes our sample size. The index ranges from 0 to 100, where 100 correspond to the highest degree of freedom from corruption, and so its value decreases with rising corruption.

Finally, existing evidence suggests that FDI has a role to play in the pursuit of entrepreneurial activities though there are arguments, both in favour of and against, its advent and presence in host countries (Acs et al., 2007; Ayyagari and Kosová, 2010; De Backer and Sleuwaegen, 2003). As such FDI alters the underlying motives of owning a business by providing previously unavailable resources as well as by drawing scarce domestic endowments away from the reach of would-be entrepreneurs. On the one hand, foreign investors make innovation accessible and act as potential sources of better technology, improved management practices, feeding into new venture creation. Additional demand for domestically produced inputs and services may sow the seed for increased entrepreneurial behaviour. On the other hand, a greater prevalence of FDI often amounts to heighten competition in product and factor markets conceivably, leading to the crowding-out of the local enterprises. Foreign firms may bid up factor prices raising the opportunity cost of new firm entry. Employment in these firms may be more desirable for latent entrepreneurs due to persistently higher wages and potential volatility in entrepreneurial earnings. To account for these possibilities, we utilize the variable measuring FDI inflows relative to GDP extracted from the WDI. The figures are in net terms such that disinvestment amount is subtracted from new investment inflows.

### 5.4.2. Estimation Methodology

This paper attempts to pin down the effects of foreign aid flows on the rates of domestic entrepreneurship in developing countries. Our baseline regression takes the following form, and it is estimated using the random effects rather than the fixed effects model as the Hausman specification test favoured the former approach in all cases:

$$\text{Entrepreneurship}_{it} = \beta_0 + \beta_1 \text{lnAIDpc}_{it-1} + \beta_2 \text{GDPpc}_{it-1} + \beta_3 \text{FDI}_{it-1} + \beta_4 \text{Registration}_{it-1} + \beta_5 \text{Corruption}_{it-1} + \beta_6 \text{Credit}_{it-1} + \alpha_t + \varepsilon_{it} \quad (5.1)$$

where $i$ and $t$ index countries and years, respectively. $Entrepreneurship_{it}$, the dependent variable, is the total early-stage entrepreneurship rate in country $i$ at year $t$. $lnAidpc_{it-1}$ is the main independent variable of interest, which is the log of foreign aid per capita disbursed to country $i$ at year $t-1$. Depending on the estimated model, $lnAidpc_{it-1}$ stands for either per capita total foreign aid inflows or one of the foreign aid categories by purpose. The latter are the inflows that are spent on education activities ($lnAIDpc\ Education_{it-1}$), physical

[120] The index is currently available for a total of 183 countries and territories worldwide (retrieved on February, 23 2015): www.heritage.org/index/freedom-from-corruption

infrastructure (*lnAIDpc Infrastructure*$_{it-1}$) or institutional reforms supporting business development (*lnAIDpc Institutions*$_{it-1}$). The model includes a set of five control variables: GDP per capita (*GDPpc*$_{it-1}$), net foreign direct investment relative to GDP (*FDI*$_{it-1}$), the number of days required for business registration (*Registration*$_{it-1}$), freedom from corruption (*Corruption*$_{it-1}$) and credit given to the private sector as a fraction of GDP (*Credit*$_{it-1}$) which are country-specific control variables. Finally, $\alpha_t$ stands for time-specific effects, and $\varepsilon_{it}$ is the random error of the model.

Due to distributional considerations foreign aid measures are subject to logarithmic transformation. All independent variables are lagged by one year, except for the year dummies. The lagged foreign aid variable is preferred because we anticipate that it may take some time for foreign aid inflows to have an effect. Furthermore, using lagged predictor variables weakens any possible endogeneity issues that may exist between our left-hand-side entrepreneurship measure and the right-hand-side variables. Robust standard errors are reported, clustered by country to account for within-group correlation.

### 5.4.3. Sample

Data on population are non-missing for each country-year pair for which foreign aid data are also available in the dataset. This means when converting aid in absolute terms to per capita figures no information is lost. Accordingly, *lnAIDpc* is available for a total of 619 country-year observations spanning from 2002 to 2013. The same also applies to the purpose-specific aid variables: *lnAIDpc Education*, *lnAIDpc Infrastructure*, *lnAIDpc Institutions.* Subsequently, mapping entrepreneurship data into foreign aid data with a one-year lag structure leaves us with 228 observations at the country-year level. The coverage of total early-stage entrepreneurship rate is less complete than that of *lnAIDpc* for developing countries. Furthermore, gaps exist in the data due to the changes in the composition of countries included in each version of the GEM study over the years. It is imperative to stress that although entrepreneurship data is accessible as of 2001 until and including 2013, the first two years of data are not utilized due to the one-year lag relationship between the dependent and independent variables. Hence, the time dimension of the analysis starts in 2003 with the entrepreneurship data which is linked to the previous year's *lnAIDpc* value. Likewise, *lnAIDpc* in 2013 is also lost as no information on entrepreneurship variable is available in the succeeding year that is 2014. Our panel runs from 2003 to 2013 on *Entrepreneurship* and from 2002 to 2012 on *lnAIDpc*.

The panel is further reduced to 209 when control variables are matched to the sample of 228 country-year observations. First, out of 228 observations, *GDPpc* is missing for 13 observations; Argentina in 2007 through 2012, Syria in 2008, and Jamaica in 2004, 2007 through 2010, 2012. Second, *FDI* is not available for Syria in 2008. Third, *Corruption* is missing for Serbia in 2006 through 2008, and for Tonga Islands in 2008. Fourth, data on *Credit* is absent for three observations; Ethiopia in 2011, Syria in 2008 and Barbados in 2010. Finally, all data points are complete for *Registration* variable. After these adjustments, the final sample used in our baseline specification is composed of 53 countries, 209 country-year observations spanning from 2003-2013 on the dependent variable, and from 2002 to 2012 on the explanatory variables.

The countries Brazil, Chile and South Africa have the maximum available data, for 11, 10 and 10 years respectively. In contrast, Bangladesh, El Salvador, Jamaica, Kazakhstan, Lebanon, Libya, Montenegro, Morocco, Slovenia, Suriname, Vanuatu, Yemen and Vietnam are represented with a single year. The average number of years per country is approximately 4 (real value is 3.94). The majority of sample countries (i.e., 30) are upper-middle-income economies according to the classification of the WB with a GNP per

capita in the range of $4 126 - $12 745. The rest are classified into three income categories low-income, lower-middle-income and high-income economies which encompass 3, 15 and 5 countries respectively. The upper-middle-income group also accounts for the bulk of the observations (see, Table 5-C-4 in the appendix C). Around one third of the assessed countries (i.e., 18) are located in Latin America and the Caribbean, the remainder are almost evenly distributed across four regions; Europe and Central Asia (i.e., 7); East Asia and Pacific, South Asia (i.e., 10); Middle East and North Africa (i.e., 9); and Sub-Saharan Africa (i.e., 9). Latin America and the Caribbean make up the majority of the observations (see, Table 5-C-5 in the appendix C).

**Table 5-1:** Descriptive statistics

| Variable | N | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| $Entrepreneurship_{t}$ | 209 | 16.39 | 9.18 | 2.60 | 52.10 |
| $AIDpc_{t-1}$ | 209 | 32.93 | 53.81 | 1.35 | 552.08 |
| $lnAIDpc_{t-1}$ | 209 | 2.73 | 1.28 | 0.30 | 6.31 |
| AIDpc $Education_{t-1}$ | 209 | 3.30 | 6.09 | 0.09 | 68.97 |
| lnAIDpc $Education_{t-1}$ | 209 | 0.55 | 1.07 | -2.43 | 4.23 |
| AIDpc $Infrasructure_{t-1}$ | 209 | 4.90 | 17.28 | 0.0012 | 230.40 |
| lnAIDpc $Infrasructure_{t-1}$ | 209 | -0.17 | 2.16 | -6.73 | 5.44 |
| AIDpc $Institutions_{t-1}$ | 209 | 1.36 | 3.40 | 0.0027 | 34.57 |
| lnAIDpc $Institutions_{t-1}$ | 209 | -1.30 | 1.98 | -5.91 | 3.54 |
| $GDPpc_{t-1}$ | 209 | 4499.48 | 2873.90 | 258.96 | 16326.25 |
| $Credit_{t-1}$ | 209 | 44.50 | 30.50 | 6.82 | 133.66 |
| $Corruption_{t-1}$ | 209 | 37.00 | 12.70 | 18 | 75 |
| $Registration_{t-1}$ | 209 | 38.79 | 37.02 | 2 | 204 |
| $FDI_{t-1}$ | 209 | 3.86 | 3.66 | -5.98 | 37.26 |

*Notes:* Sample is based on our preferred model presented in column (2) in Table 5-2. The analysis utilizes log transformed aid measures, and their absolute values are presented for comparison purposes only.

Table 5-1 summarizes descriptive statistics on our sample. The mean value of total early-stage entrepreneurship rate is 16.39% for the whole sample with considerable variation between countries and over the years. One interesting observation is that as countries get richer, entrepreneurship rate, on average terms, declines. The corresponding mean values across income groups are 29.21% (low-income), 21.95% (lower-middle-income), 15.10% (upper-middle-income) and 12.25% (high-income) (not included in Table 5-1). Donors disbursed $32.93 on average for each citizen residing in recipient countries. One would expect *AIDpc* to have an inverse relationship with economic development such that average aid declines with the rising income. Partly, the opposite is the case. Simple averages show that low-income countries receive around $3 less aid compared to their lower-middle-income counterparts (i.e., $47.34 vs. $50.43, respectively). This might reflect the representation of low-income economies with only three countries in the sample, and hence the average $47.34 aid may not represent the true mean. This unexpected finding is no longer valid in respect of other income categories. For example, the richest countries get 60% less foreign aid per capita compared to the poorest ones ($18.51 vs. $47.34, respectively).

Addressing obstacles related to physical infrastructure development seems the highest priority of aid donors, as this category absorbs, on average, more flows compared to education and institutions. One noteworthy detail is that lower-middle-income economies receive substantially higher levels of infrastructure aid. The corresponding mean values across income groups are $5.05 (low-income), $11.81 (lower-middle-income), $3.92 (upper-middle-income) and $1.73 (high-income) (not reported in Table 5-1).

Table 5-1 also shows that an average of 44.50% of GDP is released to ease financial constraints on private sector. Sample countries are, on average, closer to the undesirable end of the freedom from corruption index with a mean value of 37. Iran and Chile are ranked as the most and least corrupt countries, respectively. Entrepreneurs spend 38.79 days of their time to register their businesses with Macedonia being the least demanding country on this aspect. In contrast, it takes as much as 204 days to formally establish a new venture in Suriname. Finally, FDI net inflows account for 3.86% of GDP of a representative sample country. Please note that this variable is negative for three observations indicating that disinvestment outnumbers new inflows. These country-year pairs are Venezuela-2009, Angola-2010 and 2012.

## 5.5. Estimation Results

### 5.5.1. Aggregate Effects on Entrepreneurship of Foreign Aid

Table 5-2 shows the assessment of foreign aid effects in relation to domestic entrepreneurship with no breakdown by purpose category. Besides the baseline specification of 5.1, its variants drawing on different lag structures of total aid and the inclusion/exclusion of year effects are estimated. Our choice of using random effects is backed by both Hausman and Breusch-Pagan Lagrange multiplier tests in all models incorporated in Table 5-2.

To begin with, the first model contains only control variables and year dummies where only the coefficient on income level is significantly different from zero telling us that entrepreneurship rates shrink with rising income. Its negative sign conforms to precedent literature (Wennekers et al., 2005). The opportunity cost of owning a business relative to its return tends to augment with the higher rates of economic development. Would-be entrepreneurs may, therefore, find it risky to pursue business opportunities while safe wage-employment is already on offer. Our finding is consistent across all specifications with the exception of model (7). The magnitude of the coefficient on $GDPpc_{t-1}$ is very stable though with varying significance levels.

Access to finance ($Credit_{t-1}$) is an insignificant determinant of total early-stage entrepreneurship rate in model (1), although this is reversed in models (2) and (6) with an unexpected negative sign. Aidis et al., (2012) detect a similar relationship using the same measure of entrepreneurship and credit provision in an extended sample embracing both developed and developing countries. However, once the whole sample is split into two sub-groups by income, negatively significant effect of credit to private sector on entrepreneurship is preserved in the developing country subset. Furthermore, the relationship becomes positive at higher levels of GDP per capita. The authors infer from the former result that formal finance is of less importance in developing countries, and that borrowing opportunities through formal intermediates such as banks conceivably crowd-out informal finance. Accordingly, a negative sign on $Credit_{t-1}$ is plausible. We believe that such an interpretation also justifies our finding.

**Table 5-2:** Aggregate effects on entrepreneurship of foreign aid

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| $lnAIDpc_{t-1}$ | | 1.835** | 2.152** | | | | |
| | | (0.921) | (0.913) | | | | |
| $lnAIDpc_{t-2}$ | | | | 2.356*** | 2.498*** | | |
| | | | | (0.824) | (0.799) | | |
| $lnAIDpc_{t-3}$ | | | | | | 2.254*** | 2.385*** |
| | | | | | | (0.827) | (0.801) |
| $GDPpc_{t-1}$ | -0.001*** | -0.001** | -0.001* | -0.001** | -0.001* | -0.001** | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $FDI_{t-1}$ | 0.267 | 0.183 | 0.017 | 0.127 | -0.034 | 0.199 | 0.050 |
| | (0.173) | (0.189) | (0.155) | (0.192) | (0.156) | (0.176) | (0.139) |
| $Registration_{t-1}$ | 0.019 | 0.024 | -0.003 | 0.015 | -0.009 | -0.003 | -0.035 |
| | (0.044) | (0.045) | (0.043) | (0.045) | (0.044) | (0.037) | (0.035) |
| $Corruption_{t-1}$ | 0.063 | 0.044 | 0.049 | -0.008 | 0.005 | -0.018 | -0.027 |
| | (0.087) | (0.078) | (0.081) | (0.078) | (0.085) | (0.073) | (0.078) |
| $Credit_{t-1}$ | -0.051 | -0.057** | -0.036 | -0.049 | -0.036 | -0.065** | -0.044 |
| | (0.032) | (0.029) | (0.030) | (0.031) | (0.031) | (0.032) | (0.032) |
| Constant | 21.388*** | 15.983*** | 13.371*** | 15.781*** | 14.285*** | 17.165*** | 15.991*** |
| | (3.979) | (4.879) | (4.645) | (4.484) | (4.091) | (4.090) | (3.748) |
| Year Effects | Yes | Yes | No | Yes | No | Yes | No |
| Observations, Countries | 209, 53 | 209, 53 | 209, 53 | 203, 53 | 203, 53 | 197, 53 | 197, 53 |
| $\alpha_t = \eta_t = 0$ | [0.268] | [0.430] | | [0.316] | | [0.173] | |
| Hausman test | [0.754] | [0.765] | [0.054] | [0.760] | [0.167] | [0.780] | [0.112] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.048 | 0.068 | 0.009 | 0.088 | 0.023 | 0.095 | 0.043 |
| Between $R^2$ | 0.221 | 0.254 | 0.232 | 0.263 | 0.252 | 0.244 | 0.209 |
| Overall $R^2$ | 0.308 | 0.272 | 0.173 | 0.258 | 0.189 | 0.229 | 0.144 |
| Chi-squared | 26.944 | 43.016 | 15.122 | 46.746 | 21.689 | 46.345 | 22.637 |

*Notes:* Results correspond to Hypothesis 1. Total early-stage entrepreneurship rate is the dependent variable. Model (1) incorporates only control variables. While models (1), (2), (4) and (6) include time effects, models (3), (5) and (7) do not. Control variables are lagged by one year. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 2 and 3), two-year (models 4 and 5) and three-year (models 6 and 7) lag lengths. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

The remaining control variables, $FDI_{t-1}$, $Registration_{t-1}$ and $Corruption_{t-1}$, have an insignificant relationship with entrepreneurship in model (1), a pattern that holds true for all specifications in Table 5-2. Nonetheless, Wald Chi2 test shows that our control variables model (1) are jointly significant at the conventional level with a p-value of 0.029.

Models (2) and (3) include the one-year lagged foreign aid per capita variable ($lnAIDpc_{t-1}$) along with the same set of controls. While the former model incorporates year effects, the latter does not to ascertain the sensitivity of the coefficient of interest to the choice of specification. In both models, higher levels of per capita aid are significantly associated with increased entrepreneurship rates at the 5% level, and comparable in size. Please note that aid per capita is subject to log-transformation. All else equal, a rise of 10% in aid per head of population coincides with an increase of 0.1835% and 0.2152% in total early-stage entrepreneurial activity in models with and without year effects, respectively. The first hypothesis is confirmed by the empirical results presented here. However, given the mean entrepreneurship rate of the sample countries is equal to 16.39%, the statistical significance of aid effects in models (2) and (3) does not translate into economic significance.

The use of $lnAIDpc_{t-1}$ assumes that an increase in aid flows in year *t-1* feeds into higher rates of entrepreneurship in the succeeding year *t*. All adjustments are expected to occur within a year of time. To explore whether there are relatively longer time effects of aid, results of the two- and three-year lag lengths are reported in models (4) and (6), respectively, where year dummies are also included. Models (5) and (7) echo these alternative specifications, but then, time effects are supplanted. Our first hypothesis finds further support as the coefficient estimates of per capita aid are slightly larger than that of one-year lag with an improved significance level.

Table 5-2 also reports two diagnostic tests that uphold the choice of random effects as our estimation technique. First, we conducted the Hausman specification test for each model included in Table 5-2 to select the more appropriate model between the fixed and the random effects. Fixed effects provide consistent estimates but it may fail to be the most efficient model. Random effects model can be a more efficient alternative but we need to ensure that the more efficient model also gives consistent results. Random effects are consistent provided that county-specific factors are not correlated with other regressors. The Hausman test checks if this assumption is met. Relevant p-values show a clear rejection of the fixed effects model except than the specification (3) whose p-value is borderline insignificant (0.054). Second, we run the Breusch-Pagan Lagrange multiplier (LM) test which is a widely-used procedure for the inspection of zero variances in random effects. The null hypothesis is that there are no significant differences across countries. Breusch-Pagan LM test results are clearly in favour of the random effects model.

One salient feature of the results in Table 5-2 is that the inclusion of the time effects has no discernible effects on the performance of per capita aid variables. To confirm this conclusion in a more rigorous way, we check whether the coefficients on all years are jointly insignificant in models (1), (2), (4) and (6). Indeed, we find this is the case.

Of the models in Table 5-2, our preferred specification is the model (2). It includes the one-year lagged per capita aid and time effects. This model offers the opportunity to conduct the analysis with a relatively larger sample size, larger than if we would opt for the two- and three-year lagged versions. Furthermore, the overall $R^2$ of the model (2) is higher though the Chi2 test performs slightly less well. Please note that although time-specific effects are proved to be jointly insignificant, they are kept in the preferred model due to their role in improving the overall $R^2$.

**Table 5-3:** Disaggregated effects on entrepreneurship of purpose-specific foreign aid

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| lnAIDpc Education$_{t-1}$ | 0.704 | | | | | | | | |
| | (1.010) | | | | | | | | |
| lnAIDpc Education$_{t-2}$ | | 0.570 | | | | | | | |
| | | (1.030) | | | | | | | |
| lnAIDpc Education$_{t-3}$ | | | -0.918 | | | | | | |
| | | | (0.907) | | | | | | |
| lnAIDpc Infrastructure$_{t-1}$ | | | | 0.184 | | | | | |
| | | | | (0.290) | | | | | |
| lnAIDpc Infrastructure$_{t-2}$ | | | | | 0.691** | | | | |
| | | | | | (0.288) | | | | |
| lnAIDpc Infrastructure$_{t-3}$ | | | | | | 0.753** | | | |
| | | | | | | (0.347) | | | |
| lnAIDpc Institutions$_{t-1}$ | | | | | | | -0.180 | | |
| | | | | | | | (0.496) | | |
| lnAIDpc Institutions$_{t-2}$ | | | | | | | | -0.532 | |
| | | | | | | | | (0.454) | |
| lnAIDpc Institutions$_{t-3}$ | | | | | | | | | -0.425 |
| | | | | | | | | | (0.375) |
| lnAIDpc$_{t-1}$ | 1.407* | | | 1.488 | | | 1.982** | | |
| | (0.802) | | | (1.079) | | | (0.934) | | |
| lnAIDpc$_{t-2}$ | | 1.953*** | | | 1.630* | | | 2.728*** | |
| | | (0.717) | | | (0.928) | | | (0.865) | |
| lnAIDpc$_{t-3}$ | | | 2.546*** | | | 1.545* | | | 2.557*** |
| | | | (0.719) | | | (0.909) | | | (0.776) |
| GDPpc$_{t-1}$ | -0.001** | -0.001** | -0.001** | -0.001** | -0.001* | -0.001* | -0.001** | -0.001** | -0.001** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| FDI$_{t-1}$ | 0.171 | 0.125 | 0.213 | 0.189 | 0.122 | 0.162 | 0.201 | 0.171 | 0.217 |
| | (0.190) | (0.193) | (0.175) | (0.198) | (0.192) | (0.183) | (0.202) | (0.193) | (0.177) |
| Registration$_{t-1}$ | 0.026 | 0.016 | -0.006 | 0.024 | 0.018 | 0.001 | 0.023 | 0.015 | -0.002 |
| | (0.047) | (0.046) | (0.038) | (0.045) | (0.045) | (0.039) | (0.046) | (0.044) | (0.036) |
| Corruption$_{t-1}$ | 0.044 | -0.009 | -0.025 | 0.043 | -0.017 | -0.017 | 0.039 | -0.014 | -0.016 |
| | (0.078) | (0.079) | (0.073) | (0.081) | (0.079) | (0.077) | (0.079) | (0.076) | (0.074) |
| Credit$_{t-1}$ | -0.055* | -0.051 | -0.066** | -0.055* | -0.058* | -0.073** | -0.060** | -0.059* | -0.068** |
| | (0.030) | (0.031) | (0.030) | (0.030) | (0.031) | (0.032) | (0.030) | (0.032) | (0.032) |
| Constant | 16.833*** | 16.917*** | 17.876*** | 17.200*** | 18.143*** | 18.975*** | 15.659*** | 14.763*** | 15.989*** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (4.628) | (4.202) | (3.709) | (5.561) | (4.860) | (4.154) | (4.805) | (4.604) | (4.093) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations, Countries | 209, 53 | 203, 53 | 197, 53 | 209, 53 | 202, 52 | 196, 53 | 209, 53 | 203, 53 | 197, 53 |
| $\alpha_t = \eta_t = 0$ | [0.447] | [0.296] | [0.129] | [0.484] | [0.377] | [0.095] | [0.454] | [0.346] | [0.130] |
| Hausman test | [0.686] | [0.886] | [0.943] | [0.839] | [0.409] | [0.670] | [0.898] | [0.892] | [0.899] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.073 | 0.089 | 0.105 | 0.060 | 0.111 | 0.125 | 0.069 | 0.092 | 0.098 |
| Between $R^2$ | 0.250 | 0.267 | 0.246 | 0.262 | 0.264 | 0.234 | 0.255 | 0.275 | 0.252 |
| Overall $R^2$ | 0.261 | 0.254 | 0.257 | 0.279 | 0.258 | 0.216 | 0.282 | 0.288 | 0.255 |
| Chi-squared | 45.255 | 50.693 | 52.630 | 46.730 | 59.340 | 53.919 | 42.892 | 50.259 | 50.992 |

*Notes:* Results correspond to Hypothesis 2. Total early-stage entrepreneurship rate is the dependent variable. While the coefficient estimates on educational aid are presented in models (1 through 3), estimates for aid to physical infrastructure and institutional reforms are included in models (4 through 6) and (7 through 9), respectively. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 1, 4 and 7), two-year (models 2, 5 and 8) and three-year lag (models 3, 6 and 9) lengths. $\ln AIDpc_{t-1}$ (also its two- and three-year lagged versions) measures the proportion of aid after the shares of respective sectoral aid flows are subtracted from total aid inflows. All models include time effects. Control variables are lagged by one year. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

### 5.5.2. Disaggregated Aid Effects on Entrepreneurship

Table 5-3 shows the estimation results for the second hypothesis that foreign aid targeting entrepreneurship constraints in the areas of education (H2a), physical infrastructure (H2b) and institutional arrangements (H2c) is positively associated with new business activity in the sample countries. Models incorporate time dummies and the same set of controls with a one-year lag structure as before. Concerning the per capita purpose-specific aid variables, we employ one-, two- and three-year lag relationships with the dependent variable. The first three specifications in Table 5-3 correspond to the assessment of H2a whereas the trio in the middle is for H2b, and the last three models are for H2c. Each of these nine specifications also includes the complementary aid per capita variable. For instance, in model (1), while *lnAIDpc Education*$_{t-1}$ refers to aid to education with one-year lag, *lnAIDpc*$_{t-1}$ covers all aid inflows but educational aid with the identical lag structure. Similarly, in the model (2), *lnAIDpc Infrasructure*$_{t-1}$ is physical infrastructure aid and *lnAIDpc*$_{t-1}$ amounts to the remaining inflows after the fraction of infrastructure aid is subtracted. It is necessary to emphasize that the proportion of aid flows captured by *lnAIDpc*$_{t-1}$ variable (also its two- and three-year lagged variants) varies depending on the model in focus. We adopt the same notation to fit Table 5-3 on one page.

Control variables display a consistent pattern of significance across specifications in Table 5-3 largely comparable to those of aggregate results. First, entrepreneurship rates drop with the rising average income. Second, a large portion of credit to private sector coincides with a subsequent slowdown in the rate of total early-stage entrepreneurship activity; an effect which is more pronounced when the focus is on purpose-specific rather than aggregate aid flows. Third, the coefficients on *FDI*$_{t-1}$, *Registraion*$_{t-1}$ and *Corruption*$_{t-1}$ are insignificantly different from zero. Fourth, relevant test statistics show that time effects are jointly insignificant except than the model 6 which is significant only at a level of 10%. Finally, Hausman and Breusch-Pagan LM tests clearly support the use of the random effects model over its alternatives; that are fixed effects and OLS estimators respectively.

Results on categorical aid effects point in two directions. First, in none of the models incorporating aid to education and institutions are the relevant coefficients significantly different from zero. This evidence indicates that aid disbursed in these areas failed to serve the desired end. In contrast, the complementary per capita aid variables, *lnAIDpc*$_{t-1}$ (also two- and three year lagged versions), persistently preserve a positively significant association with entrepreneurship at varying significance levels. Second, both higher values of aid to physical infrastructure and aid to the remaining domains correspond to increments in entrepreneurship when lagged two and three periods but not in one-year lag.

While these results mark the refusal of the hypotheses H2a and H2c, they provide a partial and tentative confirmation of the hypothesis H2b. This is because, as we demonstrate later, the robustness of the finding that larger aid to physical infrastructure translates into a surge in new business activity is far from satisfactory. One fairly robust conclusion is that the shares of aid after the purpose-specific inflows are separated out (i.e., *lnAIDpc*) maintain a significant and positive association with entrepreneurship rates, varying in magnitude and significance, as can be seen in models (1) through (9) in Table 5-3. This finding is interpreted to indicate that alternative combinations of targeted foreign aid, rather than aid to education, physical infrastructure and institutions, seem to be the driving force behind its positive effect on entrepreneurship. In what follows, we take a step in this direction, and consider other aid categories covering a wide range of development objectives.

### 5.5.3. What Explains the Positive Effects on Entrepreneurship of Aggregate Foreign Aid?

The two-fold fact that aggregate aid flows are but purpose-specific aid are not positively associated with entrepreneurial activity, necessitates further examination. Total aid flows earmarked for a recipient country are divided into 36 categories by the OECD based on its intended use.[121] One plausible way of evaluating each component's contribution to entrepreneurship is to add them into the equation 5.1 concurrently. Such an implementation, however, is not feasible to address the challenge in hand for the following reasons. First, there must be sufficient observations that have complete information on each of the individual aid groupings to estimate this regression. A quick examination of our data reveals that only 2 observations out of the main sample of 209 country-year pairs satisfy this criterion. Even when the within-sample restriction is relaxed, we end up with 10 observations having non-missing information on each of the 36 purpose-specific aid categories in the post-2002 period. Second, if we presume that the lack of overlapping observations was not an issue; the next limiting factor is high pairwise correlations between certain targeted aid flows (larger than 0.7 at times). Estimates under multicollinearity are not likely to be informative, as in this case regression coefficients become statistically unreliable and difficult to interpret. Third, we believe that our sample of 209 observations is insufficiently large to accommodate 36 aid measures simultaneously along with the addition of control variables and time dummies. We have to keep the number explanatory variables in the model to a minimum in order to have statistical power.

Due to the above-mentioned reasons, we opt for an alternative method to identify the underlying drivers of the positive association between aggregate foreign aid and entrepreneurship. More specifically, we proceed with our empirical scrutiny using factor analysis (FA) which is a widely used technique for multivariate data reduction. With FA, a set of factors are extracted from the original correlated variables (purpose-specific aid categories in our case) in order to simplify the dataset whilst maintaining its important characteristics as much as possible. The retained factors can be described as a collection of uncorrelated linear functions of the original variables.

We apply FA to the 36 measures of purpose-specific aid flows[122] to undercover the latent pattern in the data. Specifically, in the first step we obtain a set of factors that capture much of the information in the original data. Subsequently, we supplant foreign aid measures in the baseline equation 5.1 with the factor scores, to then estimate this alternative specification.

Before discussing the findings of FA, a few remarks are needed to clarify our treatment of aid categories in the analysis. The simultaneous incorporation of all 36 categorical aid measures in FA results in a sample of 10 country-year observations having full information in the post-2002 period. The year 2002 is proposed by the OECD as being a turning point where data on categorical aid are deemed to be reliable and consistent over the years. As expected the 10-observation sample is further reduced to 2 when we restrict the focus to our main sample of 209. Put differently, there are only 2 country-year pairs within our sample of 209 that have non-missing information on each of the 36 purpose-specific aid groups. These problems are also touched upon previously. There are two ways of getting around this difficulty: i) the exclusion of the aid categories causing insufficient data overlap, and ii) rather than omitting them from FA, they can be put together with other relevant aid categories at a higher level of aggregation guided by the OECD classification.

[121] See Table 5-B-1 in the appendix B for individual aid categories.

[122] To maintain consistency, per capita purpose-specific aid measures are log-transformed prior to the factor analysis.

We conducted FA using both alternatives. While the exclusion approach leaves us with 23 targeted aid categories, we end up with 22 aid categories under the aggregation strategy. Table 5-B-1 in the appendix B shows the excluded and aggregated categories.

**Table 5-4:** Estimation results based on the factor analysis

| | Exclusion<br>(1) | Aggregation<br>(2) |
|---|---|---|
| Factor $I_{t-1}$ | 3.090** | 2.670** |
| | (1.373) | (1.359) |
| Factor $II_{t-1}$ | 0.122 | 0.174 |
| | (1.535) | (1.469) |
| Factor $III_{t-1}$ | 1.096 | -0.192 |
| | (0.903) | (1.131) |
| $GDPpc_{t-1}$ | -0.000 | -0.001* |
| | (0.000) | (0.000) |
| $FDI_{t-1}$ | 0.264 | 0.267 |
| | (0.215) | (0.200) |
| $Registration_{t-1}$ | 0.075 | 0.064 |
| | (0.048) | (0.047) |
| $Corruption_{t-1}$ | -0.006 | 0.039 |
| | (0.083) | (0.077) |
| $Credit_{t-1}$ | -0.058* | -0.054 |
| | (0.034) | (0.037) |
| Constant | 20.873*** | 20.658*** |
| | (4.304) | (4.373) |
| Year Effects | Yes | Yes |
| Observations, Countries | 178, 49 | 182, 49 |
| $\alpha_t = \eta_t = 0$ | [0.087] | [0.000] |
| Hausman test | [0.206] | [0.153] |
| Breusch-Pagan LM test | [0.000] | [0.000] |
| Within $R^2$ | 0.069 | 0.059 |
| Between $R^2$ | 0.452 | 0.472 |
| Overall $R^2$ | 0.366 | 0.393 |
| Chi-squared | 102.508 | 99.065 |

*Notes:* Total early-stage entrepreneurship rate is the dependent variable. Factor scores substitute aid variables in both models. While Model (1) employs factors obtained from the exclusion of certain aid categories, Model (2) utilizes factors based on the aggregation of these categories. Time effects are included in both models. Retained factors as well as control variables are lagged one year. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

After the implementation of FA, we produce two scree plots using the eigenvalues of the extracted factors; one for the exclusion, and another for the aggregation approach (see, Figures 5-B-1 and 5-B-2 in the appendix B). To determine the number of retained factors, we initially followed the Kaiser criterion which suggests that factors with eigenvalues greater than one should be kept. This leads us to retain two factors after both FA. We argue that rather than relying on a single criterion, an all-embracing approach that also takes into account other benchmarks should be pursued. Supporting this view, a closer inspection of the scree plots and the total amount of variance explained by the two retained factors reveal that the Kaiser criterion does not seem to yield the best results for our

dataset. The desired pattern in a scree plot easing the determination of the number of retained factors is the presence of a steep curve or break point followed by a flat line. According to this, our scree plots suggest us to keep three factors which explain as much as 78% (exclusion approach) and 75% (aggregation approach) of the total variance in the data. Hence, we decided to retain three factors.

After the retention of three factors, we apply orthogonal rotation (via varimax method), generating the factor loadings displayed in the Tables 5-B-2 and 5-B-3 in the appendix B. While orthogonal rotation yields uncorrelated factors, its variant, oblique method, allows factors to be correlated with each other. The implementation of the oblique method using our data results in high correlations between the retained factors (above 0.62). As this level of correlation complicates the interpretation of the point estimates in the subsequent regression analysis where factor scores substitute aid variables, we opted for the orthogonal rather than oblique rotation in our analysis.

It is appropriate to mention that Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy is quite satisfactory for both factor analyses with corresponding values of 0.94 (exclusion sample) and 0.95 (aggregation sample) which are above the recommended 0.7 threshold level. Furthermore, a low level of 'uniqueness' is preferred for each variable included in FA as the lower the values on this parameter, the better explained the variables by the retained factors. It ranges from 0 to 1, and equals 0.31 (on average) for both factor analyses.

Table 5-4 shows the results obtained from the re-estimation of our baseline equation 5.1 using factor scores which replace the original aid per capita variables. While model (1) utilizes the scores derived from the factor analysis excluding certain aid categories, model (2) is based on scores available from the aggregation of these categories. Results suggest that coefficients on the first factor in both models are significantly positive at the 5% level. In contrast, *Factor* $II_{t-1}$ and *Factor* $III_{t-1}$ are found to be insignificant determinants of entrepreneurship in the sample countries.

On balance, evidence suggests that aid categories represented by *Factor* $I_{t-1}$ are better at explaining through which channels aid flows contribute to entrepreneurship development. As shown in Tables 5-B-2 and 5-B-3 in the appendix B, the first factors retained after both factor analyses, by and large, stand for the same purpose-specific aid categories including basic health, general health, population policies/programmes and reproductive health, basic education, emergency response and agriculture. Noteworthy is that the coverage of the first factor obtained through the aggregation of aid categories is more extensive than the one derived from the exclusion of aid categories. This difference occurs not because aid categories shift between retained factors but because the majority of aid categories excluded from the initial factor analysis also load to the first factor once they are taken into account in aggregate terms. These purpose-specific aid flows include, among others, development food aid/food security assistance, disaster prevention and preparedness, reconstruction relief and rehabilitation and conflict prevention and resolution, peace and security. Taken together, the composition of aid categories represented by *Factor* $I_{t-1}$ suggests that aid designed to address constraints in basic needs, and to strengthen the recipient countries' capacity to sustain an adequate level of human security (both in times of disaster and conflict) are the main drivers of increased entrepreneurship.

### 5.5.4. Robustness Analyses

We evaluate the robustness of our results in several directions including the use of alternative measures of foreign aid and entrepreneurship, the addition of different control

variables, the introduction of non-linear relationships and further disaggregation of sectoral aid. First, the effects of per capita aggregate and sectoral aid are reassessed by substituting total early-stage entrepreneurship with new business ownership and nascent entrepreneurship rates as the dependent variables. Both of these measures are obtained from the GEM dataset. While the former is defined as the proportion of the adult population who own a firm with a lifetime of 3-42 months, the latter represents the proportion of the adult population who are currently active in establishing a business with a positive cash flow no more than 3 months. Relevant findings are shown in Tables 5-A-1, 5-A-2 and 5-A-7 in the appendix A. We find no major changes in results.

Second, the use of the log transformation of the per capita aggregate aid in the baseline specification 5.1 is abandoned, with results displayed in Table 5-A-5. Furthermore, we supplant aid per capita with net aid flows relative to GNI extracted from the WDI, and the results are included in Table 5-A-6. The new evidence verifies that our results are robust to the withdrawal of the log transformation of the main independent variable of interest as well as the use of its alternative.

Next, we introduce additional control variables identified by previous research. To begin with, two conflicting perspectives are at work on the link between GDP growth rate in a country and the decision on being an entrepreneur. According to the recession-push view, when economic circumstances are poor (e.g., high unemployment rates), individuals are inclined to be self-employed due to the shortages in job availability. In contrast, the prosperity-pull argument postulates that entrepreneurship is pro-cyclical, that is it is high during booms and low during busts (Parker, 2004). We consider whether the conclusions drawn in the previous sections remain valid to the inclusion of GDP growth rate as an explanatory variable. Relevant data is obtained from the WDI. Moreover, there is a strand of literature focusing on the importance of geography on the economic performance of countries (Gallup et al., 1999; Sachs, 2001). Although receiving less attention, geographical conditions are also closely intertwined with entrepreneurship, constituting an essential part of the external environment in which entrepreneurs operate and make investment decisions. For instance, new firms' potential to expand overseas markets and to exploit economies of scale may be confined due to a particular geographical condition. Accordingly, we utilize two control variables—distance from the equator and a dummy for landlocked countries—to capture the geographical influence on entrepreneurial activities. With regard to the former, production conditions tend to be less favourable in countries proximate to the tropical regions due to adverse ecological effects. Nations closer to the equator also suffer from high disease burdens. Concerning the geographic isolation, landlocked countries face high costs of economic transactions (e.g., transportation costs), reflecting the remoteness from international markets. Data on both measures is obtained from the CEPII database by Mayer and Zignago (2011). Another alteration in the baseline specification here is the replacement of GDP per capita in absolute terms with the log form following Aidis et al., (2012). Tables 5-A-3 and 5-A-8 show new estimates with the former representing the aggregate aid effects and the latter displaying the impact of purpose-specific aid. Once again, we observe no major deviations from our original results. The main message of the paper that aggregate aid matters for entrepreneurship, but not the categorical ones, still holds true.

Fourth, Wennekers et al., (2005) allow for a nonlinear relationship between GDP per capita and entrepreneurial activity represented by a squared term of the continuous income variable. Similarly, previous studies provide evidence for the nonlinear dependence of entrepreneurship rates on FDI. For instance, while Barrios et al., (2005) report U-shaped FDI effects on the entry of domestic firms in Ireland, Lee et al., (2014) identify an inverted U-shaped association between intra- and inter-regional FDI, and entrepreneurship in South

Korea. Both studies rely on data from manufacturing sectors. Barrios et al., (2005) attribute the nonlinear FDI effects to the heightened competition which initially deters firm entry. However, its strength weakens over time, and eventually, the adverse effects of competition are outweighed by knowledge spillovers. Lee et al., (2014) make exactly the opposite argument in an effort to justify the revealed findings. We adjust the baseline model in ways suggested by the results of earlier work, and add quadratic terms for both GDP per capita and FDI along with the linear terms. GDP growth rate is also kept in the analysis. Corroborating prior literature, we detect curvilinear effects of both GDP (U-shaped) and FDI (inverted U-shaped) on total early-stage entrepreneurship rate but no bearings on the main results. Related findings are presented in Tables 5-A-4 and 5-A-9 with a focus on aggregate and categorical aid respectively.

Our fifth robustness check involves a further disaggregation of purpose-specific inflows into their subcomponents. One might conceive that certain types of education might be of greater or lesser importance to the formation of new businesses. Treating aid to education as a uniform array of disbursements may mask important variations in the effects of its constituents on entrepreneurship. The same thinking also extends to aid flows channelled towards the reinforcement of physical infrastructure and institutions. Against this backdrop, educational aid is split into higher education, vocational training, and advanced technical and managerial training. Likewise, aid to physical infrastructure is divided into three distinct parts; transport and storage, communication, and energy generation and supply. Finally, aid inflows supporting institutions are broken into the divisions of anti-corruption organizations and institutions, legal and judicial development, and business support services and institutions. The classification is performed based on the OECD list describing aid categories. Next, the baseline equation 5.1 is re-estimated using these detailed aid categories. Results are presented in Table 5-A-10 for the subcategories of educational aid, in Table 5-A-11 for the constituents of aid to physical infrastructure, and in Table 5-A-12 for aid to institutional practises. As shown, this robustness exercise ensures that our main results are resilient to further breakdown of data. A point of clarification is in order. Estimation with the subcategory of anti-corruption organizations and institutions yields a sample of only 85 observations, and it does not give a credible Wald chi-squared score. Hence results are not reported here but they corroborate with the main results.

Finally, the specification where factor scores substitute per capita aid measures are subjected to a set of aforementioned robustness checks including the use of alternative dependent variable, the addition of nonlinear terms and GDP growth rate along with the log transformed GDP per capita. Relevant estimates are displayed in Table 5-A-13, and they further validate the main results of our study.

## 5.6. Discussion and Concluding Remarks

Since its introduction in the 1950s, the focus of foreign aid has changed several times in order to identify the mechanisms that are the most effective for poverty reduction—the first and foremost objective. There is clarity on what needs to be achieved yet, the appropriate course of actions, means and methods in addressing the problem in hand vary during the seven-decade experience of aid. This is not to say that there are substantial differences in the utilized approaches with no traces of overlap. Rather, various policy instruments of poverty alleviation backed by donors are temporal, and they appear, disappear and recur again at a later phase at different orders of importance, often join forces together to improve the lives of economically- and socially-vulnerable people. Such efforts include direct interventions in the areas of education, health and social infrastructure at the micro-

level, support programs for social inclusion and economic participation, aid conditionality targeting at policy reforms, aid for privatization, the reinforcement of capacities in particular sectors such as agriculture, aid for trade facilitation and so on. The list is almost endless, and its components cut across micro- and macro-level dimensions of development initiatives.

The question of whether such efforts achieve their desired ends, so-called aid effectiveness, is frequently asked yet, little agreement exists on the answer. The empirical evidence on which the debate is based is the same. It is the differences in judgement and thinking of the proponents and opponents of foreign aid that cause diversity of opinion. On the one hand, the proponents argue that it is the moral responsibility of developed countries to give away resources to developing countries faced with the scarcity of financial means. However, foreign aid that is already allocated is simply insufficient for rapid and sustained growth. Furthermore, some aid recipients, particularly in Africa, suffer from peculiar problems in terms of sociocultural, political, and economic environment (e.g., being landlocked and located in tropical regions) whose adverse effects are mitigated by foreign aid. Proponents argue that realized levels of economic growth would have been lower, if foreign aid had not been released at all. On the other hand, the opponents contend that foreign aid hardly ever gets to those who need it most. Aid flows are seen as windfalls that are wasted by rent-seeking activities and corruption failing to meet the projected objectives of growth and eventual decline in poverty.

These diverging views seem to find a common ground with the recent shift towards the promotion of entrepreneurial activities in aid-receiving countries. Entrepreneurship is seen as a vital input for the development outcomes that foreign aid aims to achieve. The underlying argument is that boosting entrepreneurship, among others, empowers citizens particularly women, youth and disadvantaged groups and creates changes in the economic system through innovation and technological progress. Entrepreneurship generates job opportunities, provides productivity gains through pro-competitive forces and increases tax revenues to finance public services. Therefore, with the aim to add further insights as to our understanding of development, this study links two important areas of development thinking: entrepreneurship and foreign aid.

The analysis of the impact of foreign aid flows is performed for both aggregate and purpose-specific aid. We find a positively significant association between total foreign aid flows and entrepreneurship rates in our sample countries, using a random effects model. This finding is robust to the inclusion of a variety of control variables, as well as time effects. Furthermore, the positive effect of total foreign aid flows materializes over a three-year time horizon. In contrast, we reveal that foreign aid flows directed at activities supporting education and institutional reforms are not related to the total early-stage entrepreneurship rate. Although a positive impact of aid to physical infrastructure on entrepreneurship is detected, the robustness of this result is not substantiated by additional sensitivity analyses.

The detection of the aggregate effect of aid along with the inconclusive results from targeted aid requires additional analysis to identify what drives the former effect. In the examination of purpose-specific foreign aid, we only employ a small set of aid categories i.e., those that are argued to be particularly impactful for entrepreneurship development. In a subsequent analysis, we applied the factor analysis technique, utilizing all 36 main categories of foreign aid flows, as classified by the OECD, to obtain a few factors underlying the original data. In so doing, we attempted to find linear combinations of the categorical aid that may potentially generate positively significant effects on

entrepreneurship rates. The results achieved by using factor scores instead of aid variables provide some interesting insights into the potential triggers of entrepreneurship.

The additional analysis highlights the importance of basic needs provision for nurturing new business activity. Among others, aid relaxing the constraints in the areas of basic education and health, food supply, emergency response, reconstruction subsequent to political and economic instability, disaster preparedness, conflict prevention and human security matter most for entrepreneurship. Would-be entrepreneurs across developed and developing countries do not always have equitable access to opportunities such as predictable business environment (free of corruption and regulatory burden), economic and political stability, technology, knowledge of various kinds, higher education and other advanced learning opportunities and so on. It is reasonable to assume that individuals who adapt to conditions, and take a positive stance towards making the most of what is available to them increase their potential for success. For example, while, for a young girl in a developed country, the completion of basic education may mean the fulfilment of the requirement for the next level of schooling, it is likely to bear more significance for a girl living under more challenging conditions. Basic schooling may be seen a period of knowledge and skills acquisition, socialisation that will provide guidance the disadvantaged youth throughout her life and influence decisions taken. There is evidence, particularly in the microfinance literature, showing that female entrepreneurs, though equipped with lower level of educational attainment, increasingly participate in economic life by owning small- and micro-enterprises.

Entrepreneurs in developing countries may be more immune to instabilities of various kinds leading to economic downturns. What may seem unusual from the perspective of business owners in advanced economies may be an everyday experience for entrepreneurs active in some of the least income countries. For example, civil and armed conflicts constitute such undesirable situations. Previous evidence shows that firms operating under conflict conditions are able to survive through timely decisions including the relocation of operations, the avoidance of new investment, etc. With the appropriate post-conflict support and reconstruction, entrepreneurial activity may gain momentum once hostilities come to a halt (Brück et al., 2013). This line of reasoning resonates with our findings from factor analysis which suggest that the provision of an adequate level of human security tends to be positively associated with entrepreneurship.

# 5.7. Appendices

## Appendix A: Results Tables for Robustness Analyses

**Table 5-A-1:** Robustness analysis I: Aggregate results with new business ownership rate

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| $lnAIDpc_{t-1}$ | | 0.971* | 1.157** | | | | |
| | | (0.536) | (0.502) | | | | |
| $lnAIDpc_{t-2}$ | | | | 1.266*** | 1.333*** | | |
| | | | | (0.427) | (0.393) | | |
| $lnAIDpc_{t-3}$ | | | | | | 0.948* | 0.894* |
| | | | | | | (0.516) | (0.467) |
| $GDPpc_{t-1}$ | -0.001*** | -0.001*** | -0.001** | -0.001*** | -0.001** | -0.001*** | -0.001** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $FDI_{t-1}$ | 0.093 | 0.047 | -0.029 | 0.016 | -0.056 | 0.057 | -0.012 |
| | (0.108) | (0.115) | (0.099) | (0.111) | (0.092) | (0.110) | (0.087) |
| $Registration_{t-1}$ | 0.019 | 0.022 | 0.007 | 0.018 | 0.006 | 0.010 | -0.000 |
| | (0.025) | (0.026) | (0.023) | (0.026) | (0.024) | (0.023) | (0.022) |
| $Corruption_{t-1}$ | 0.034 | 0.024 | 0.004 | -0.011 | -0.020 | -0.025 | -0.026 |
| | (0.053) | (0.049) | (0.043) | (0.048) | (0.043) | (0.046) | (0.043) |
| $Credit_{t-1}$ | -0.006 | -0.009 | 0.004 | -0.004 | 0.002 | -0.008 | -0.004 |
| | (0.022) | (0.021) | (0.021) | (0.022) | (0.021) | (0.021) | (0.022) |
| Constant | 10.375*** | 7.519*** | 6.594*** | 7.333*** | 7.115*** | 8.959*** | 8.973*** |
| | (2.186) | (2.775) | (2.346) | (2.559) | (2.118) | (2.516) | (2.185) |
| Year Effects | Yes | Yes | No | Yes | No | Yes | No |
| Observations, Countries | 209, 53 | 209, 53 | 209, 53 | 203, 53 | 203, 53 | 197, 53 | 197, 53 |
| $\alpha_t = \eta_t = 0$ | [0.105] | [0.152] | | [0.141] | | [0.172] | |
| Hausman test | [0.986] | [0.994] | [0.497] | [0.985] | [0.769] | [0.932] | [0.755] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.058 | 0.073 | 0.013 | 0.083 | 0.028 | 0.048 | 0.001 |
| Between $R^2$ | 0.212 | 0.249 | 0.242 | 0.254 | 0.250 | 0.246 | 0.242 |
| Overall $R^2$ | 0.300 | 0.284 | 0.214 | 0.259 | 0.209 | 0.254 | 0.210 |
| Chi-squared | 26.828 | 35.143 | 14.205 | 42.412 | 21.343 | 36.681 | 13.719 |

*Notes:* Results correspond to Hypothesis 1. New business ownership rate is the dependent variable. Model (1) incorporates only control variables. While models (1), (2), (4) and (6) include time effects, models (3), (5) and (7) do not. Control variables are lagged by one year. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 2 and 3), two-year (models 4 and 5) and three-year lag (models 6 and 7) lengths. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-2:** Robustness analysis II: Aggregate results with nascent entrepreneurship rate

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| $lnAIDpc_{t-1}$ | | 1.113* | 1.250* | | | | |
| | | (0.666) | (0.639) | | | | |
| $lnAIDpc_{t-2}$ | | | | 1.236** | 1.322** | | |
| | | | | (0.629) | (0.586) | | |
| $lnAIDpc_{t-3}$ | | | | | | 1.423** | 1.599*** |
| | | | | | | (0.582) | (0.572) |
| $GDPpc_{t-1}$ | -0.000* | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $FDI_{t-1}$ | 0.172* | 0.112 | 0.023 | 0.098 | 0.010 | 0.125 | 0.042 |
| | (0.095) | (0.107) | (0.096) | (0.110) | (0.097) | (0.094) | (0.084) |
| $Registration_{t-1}$ | 0.007 | 0.010 | 0.000 | 0.006 | -0.005 | -0.005 | -0.024 |
| | (0.025) | (0.026) | (0.026) | (0.026) | (0.027) | (0.022) | (0.020) |
| $Corruption_{t-1}$ | 0.029 | 0.014 | 0.037 | 0.000 | 0.020 | -0.002 | -0.007 |
| | (0.051) | (0.046) | (0.052) | (0.048) | (0.058) | (0.045) | (0.049) |
| $Credit_{t-1}$ | -0.050** | -0.052*** | -0.047** | -0.049** | -0.045** | -0.059*** | -0.046** |
| | (0.021) | (0.019) | (0.019) | (0.021) | (0.020) | (0.022) | (0.022) |
| Constant | 12.047*** | 8.811*** | 7.484** | 8.977*** | 8.018*** | 8.877*** | 8.016*** |
| | (2.419) | (3.199) | (3.036) | (3.004) | (2.720) | (2.656) | (2.456) |
| Year Effects | Yes | Yes | No | Yes | No | Yes | No |
| Observations, Countries | 209, 53 | 209, 53 | 209, 53 | 203, 53 | 203, 53 | 197, 53 | 197, 53 |
| $\alpha_t = \eta_t = 0$ | [0.063] | [0.039] | | [0.045] | | [0.055] | |
| Hausman test | [0.996] | [0.423] | [0.210] | [0.553] | [0.305] | [0.868] | [0.145] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.064 | 0.076 | 0.003 | 0.081 | 0.005 | 0.092 | 0.055 |
| Between $R^2$ | 0.189 | 0.214 | 0.214 | 0.219 | 0.225 | 0.197 | 0.162 |
| Overall $R^2$ | 0.226 | 0.206 | 0.160 | 0.210 | 0.172 | 0.182 | 0.122 |
| Chi-squared | 28.093 | 46.547 | 14.642 | 46.951 | 17.841 | 42.670 | 19.563 |

*Notes:* Results correspond to Hypothesis 1. Nascent entrepreneurship rate is the dependent variable. Model (1) incorporates only control variables. While models (1), (2), (4) and (6) include time effects, models (3), (5) and (7) do not. Control variables are lagged by one year. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 2 and 3), two-year (models 4 and 5) and three-year (models 6 and 7) lag lengths. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-3:** Robustness analysis III: Aggregate results with additional control variables

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| $lnAIDpc_{t-1}$ | | 1.403 | 1.707* | | | | |
| | | (1.029) | (0.990) | | | | |
| $lnAIDpc_{t-2}$ | | | | 1.911** | 2.043** | | |
| | | | | (0.957) | (0.923) | | |
| $lnAIDpc_{t-3}$ | | | | | | 1.768* | 1.841** |
| | | | | | | (0.926) | (0.872) |
| $lnGDPpc_{t-1}$ | -4.225*** | -3.642*** | -2.690** | -3.777*** | -3.126** | -3.251*** | -2.368** |
| | (1.263) | (1.163) | (1.201) | (1.252) | (1.321) | (1.093) | (1.182) |
| GDP $growth_{t-1}$ | -0.021 | -0.030 | -0.047 | 0.020 | -0.005 | 0.053 | 0.033 |
| | (0.046) | (0.049) | (0.052) | (0.071) | (0.056) | (0.070) | (0.058) |
| $FDI_{t-1}$ | 0.281* | 0.216 | 0.074 | 0.165 | 0.022 | 0.223 | 0.090 |
| | (0.152) | (0.171) | (0.148) | (0.175) | (0.145) | (0.160) | (0.129) |
| $Registration_{t-1}$ | 0.018 | 0.020 | -0.007 | 0.012 | -0.012 | -0.006 | -0.037 |
| | (0.043) | (0.044) | (0.043) | (0.044) | (0.045) | (0.037) | (0.036) |
| $Corruption_{t-1}$ | 0.096 | 0.078 | 0.080 | 0.040 | 0.051 | 0.029 | 0.019 |
| | (0.077) | (0.072) | (0.078) | (0.073) | (0.082) | (0.068) | (0.073) |
| $Credit_{t-1}$ | -0.030 | -0.038 | -0.022 | -0.028 | -0.019 | -0.040 | -0.023 |
| | (0.030) | (0.027) | (0.029) | (0.029) | (0.031) | (0.029) | (0.031) |
| Landlocked dummy | 4.149 | 3.154 | 3.856 | 2.510 | 2.979 | 2.522 | 3.377 |
| | (3.588) | (3.661) | (3.798) | (3.807) | (3.896) | (3.983) | (4.116) |
| lnDistance from equator | -2.672*** | -2.661*** | -3.143*** | -2.660*** | -3.012*** | -2.729*** | -3.212*** |
| | (1.031) | (0.996) | (1.059) | (0.998) | (1.044) | (1.007) | (1.093) |
| Constant | 55.604*** | 47.935*** | 40.429*** | 48.182*** | 43.534*** | 45.897*** | 40.285*** |
| | (9.355) | (9.525) | (9.173) | (9.654) | (9.169) | (9.103) | (8.946) |
| Year Effects | Yes | Yes | No | Yes | No | Yes | No |
| Observations, Countries | 208, 52 | 208, 52 | 208, 52 | 202, 52 | 202, 52 | 196, 52 | 196, 52 |
| $\alpha_t = \eta_t = 0$ | [0.433] | [0.584] | | [0.405] | | [0.146] | |
| Hausman test | [0.994] | [0.997] | [0.598] | [0.992] | [0.885] | [0.988] | [0.560] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Between $R^2$ | 0.350 | 0.376 | 0.374 | 0.385 | 0.396 | 0.369 | 0.355 |
| Overall $R^2$ | 0.418 | 0.401 | 0.340 | 0.394 | 0.350 | 0.374 | 0.311 |
| Chi-squared | 57.142 | 68.798 | 34.338 | 93.161 | 48.293 | 83.252 | 39.281 |

*Notes:* Results correspond to Hypothesis 1. Total early-stage entrepreneurship rate is the dependent variable. All models include GDP growth, landlocked dummy and distance from equator (in absolute latitude degrees) as additional controls. Model (1) incorporates only control variables. While models (1), (2), (4) and (6) include time effects, models (3), (5) and (7) do not. Control variables except landlocked dummy and distance from equator are lagged by one year. GDPpc, distance from equator and aid variables are subject to logarithmic transformation, and the latter are added into the models with one-year (models 2 and 3), two-year (models 4 and 5) and three-year (models 6 and 7) lag lengths. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-4:** Robustness analysis IV: Aggregate results with nonlinear terms

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| $lnAIDpc_{t-1}$ | | 1.560* | 2.010** | | | | |
| | | (0.922) | (0.887) | | | | |
| $lnAIDpc_{t-2}$ | | | | 2.113** | 2.418*** | | |
| | | | | (0.838) | (0.795) | | |
| $lnAIDpc_{t-3}$ | | | | | | 2.068** | 2.328*** |
| | | | | | | (0.813) | (0.773) |
| $GDPpc_{t-1}$ | -0.004*** | -0.003*** | -0.003** | -0.003*** | -0.003** | -0.003*** | -0.002** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| $GDPpc_{t-1}$ * $GDPpc_{t-1}$ | 0.000** | 0.000** | 0.000 | 0.000** | 0.000* | 0.000** | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| GDP $growth_{t-1}$ | -0.021 | -0.033 | -0.058 | 0.010 | -0.020 | 0.042 | 0.015 |
| | (0.048) | (0.051) | (0.058) | (0.073) | (0.061) | (0.071) | (0.063) |
| $FDI_{t-1}$ | 0.542** | 0.476* | 0.206 | 0.455* | 0.161 | 0.528** | 0.254 |
| | (0.238) | (0.244) | (0.225) | (0.252) | (0.227) | (0.211) | (0.187) |
| $FDI_{t-1}$ * $FDI_{t-1}$ | -0.014* | -0.014** | -0.010 | -0.014** | -0.009 | -0.016*** | -0.011* |
| | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.006) | (0.006) |
| $Registration_{t-1}$ | 0.024 | 0.027 | -0.008 | 0.021 | -0.011 | 0.005 | -0.036 |
| | (0.040) | (0.042) | (0.041) | (0.043) | (0.043) | (0.037) | (0.035) |
| $Corruption_{t-1}$ | 0.086 | 0.064 | 0.061 | 0.023 | 0.027 | 0.006 | -0.015 |
| | (0.087) | (0.082) | (0.089) | (0.082) | (0.092) | (0.076) | (0.084) |
| $Credit_{t-1}$ | -0.043 | -0.049* | -0.028 | -0.041 | -0.026 | -0.053* | -0.031 |
| | (0.031) | (0.027) | (0.029) | (0.030) | (0.031) | (0.030) | (0.032) |
| Constant | 25.578*** | 20.736*** | 17.178*** | 19.429*** | 17.277*** | 19.920*** | 17.868*** |
| | (3.865) | (5.008) | (4.776) | (4.575) | (4.098) | (4.389) | (4.079) |
| Year Effects | Yes | Yes | No | Yes | No | Yes | No |
| Observations, Countries | 208, 52 | 208, 52 | 208, 52 | 202, 52 | 202, 52 | 196, 52 | 196, 52 |
| $\alpha_t = \eta_t = 0$ | [0.129] | [0.303] | | [0.204] | | [0.020] | |
| Hausman test | [0.151] | [0.319] | [0.261] | [0.998] | [0.331] | [0.780] | [0.838] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Between $R^2$ | 0.266 | 0.300 | 0.248 | 0.308 | 0.278 | 0.307 | 0.240 |
| Overall $R^2$ | 0.350 | 0.332 | 0.212 | 0.323 | 0.230 | 0.303 | 0.184 |
| Chi-squared | 49.046 | 58.804 | 26.371 | 66.757 | 33.483 | 68.039 | 32.295 |

*Notes:* Results correspond to Hypothesis 1. Total early-stage entrepreneurship rate is the dependent variable. All models include GDP growth, and the nonlinear terms of GDPpc and FDI as additional control variables. While models (1), (2), (4) and (6) include time effects, models (3), (5) and (7) do not. Control variables are lagged by one year. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 2 and 3), two-year (models 4 and 5) and three-year (models 6 and 7) lag lengths. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-5:** Robustness analysis V: Aggregate results with AIDpc in absolute terms

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| $AIDpc_{t-1}$ | | 0.045*** | 0.049*** | | | | |
| | | (0.015) | (0.014) | | | | |
| $AIDpc_{t-2}$ | | | | 0.030 | 0.035 | | |
| | | | | (0.026) | (0.026) | | |
| $AIDpc_{t-3}$ | | | | | | 0.045* | 0.048** |
| | | | | | | (0.024) | (0.023) |
| $GDPpc_{t-1}$ | -0.001*** | -0.001** | -0.001* | -0.001*** | -0.001** | -0.001** | -0.001 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $FDI_{t-1}$ | 0.267 | 0.192 | 0.042 | 0.184 | 0.018 | 0.169 | 0.017 |
| | (0.173) | (0.175) | (0.139) | (0.187) | (0.148) | (0.182) | (0.149) |
| $Registration_{t-1}$ | 0.019 | 0.019 | -0.012 | 0.009 | -0.019 | -0.014 | -0.047 |
| | (0.044) | (0.044) | (0.040) | (0.044) | (0.042) | (0.037) | (0.035) |
| $Corruption_{t-1}$ | 0.063 | 0.057 | 0.049 | 0.037 | 0.044 | 0.024 | 0.008 |
| | (0.087) | (0.080) | (0.084) | (0.082) | (0.089) | (0.079) | (0.084) |
| $Credit_{t-1}$ | -0.051 | -0.073** | -0.052 | -0.060** | -0.046 | -0.073** | -0.049 |
| | (0.032) | (0.030) | (0.032) | (0.029) | (0.031) | (0.029) | (0.031) |
| Constant | 21.388*** | 19.942*** | 18.604*** | 21.302*** | 20.083*** | 21.976*** | 21.098*** |
| | (3.979) | (3.797) | (3.666) | (3.954) | (3.807) | (3.551) | (3.482) |
| Year Effects | Yes | Yes | No | Yes | No | Yes | No |
| Observations, Countries | 209, 53 | 209, 53 | 209, 53 | 203, 53 | 203, 53 | 197, 53 | 197, 53 |
| $\alpha_t = \eta_t = 0$ | [0.268] | [0.394] | | [0.372] | | [0.256] | |
| Hausman test | [0.754] | [0.779] | [0.009] | [0.715] | [0.003] | [0.841] | [0.031] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.048 | 0.058 | 0.002 | 0.027 | 0.009 | 0.064 | 0.015 |
| Between $R^2$ | 0.221 | 0.377 | 0.355 | 0.383 | 0.398 | 0.305 | 0.273 |
| Overall $R^2$ | 0.308 | 0.296 | 0.213 | 0.311 | 0.238 | 0.246 | 0.152 |
| Chi-squared | 26.944 | 44.350 | 22.902 | 30.518 | 12.684 | 39.820 | 19.228 |

*Notes:* Results correspond to Hypothesis 1. Total early-stage entrepreneurship rate is the dependent variable. Model (1) incorporates only control variables. While models (1), (2), (4) and (6) include time effects, models (3), (5) and (7) do not. Control variables are lagged by one year. Aid variables are not subject to logarithmic transformation any more, and are used in regressions in absolute terms. Furthermore, they are added into the models with one-year (models 2 and 3), two-year (models 4 and 5) and three-year (models 6 and 7) lag lengths. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-6:** Robustness analysis VI: Aggregate results with net ODA received relative to GNI

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| $AID/GNI_{t-1}$ | | 0.554 | 0.611 | | | | |
| | | (0.418) | (0.375) | | | | |
| $AID/GNI_{t-2}$ | | | | 1.324*** | 1.389*** | | |
| | | | | (0.368) | (0.355) | | |
| $AID/GNI_{t-3}$ | | | | | | 0.985** | 1.021*** |
| | | | | | | (0.417) | (0.381) |
| $GDPpc_{t-1}$ | -0.001*** | -0.001** | -0.001 | -0.001 | -0.000 | -0.001 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $FDI_{t-1}$ | 0.267 | 0.251 | 0.101 | 0.178 | 0.009 | 0.206 | 0.051 |
| | (0.174) | (0.161) | (0.127) | (0.160) | (0.124) | (0.154) | (0.118) |
| $Registration_{t-1}$ | 0.020 | 0.023 | -0.010 | 0.014 | -0.014 | -0.005 | -0.038 |
| | (0.044) | (0.043) | (0.039) | (0.041) | (0.039) | (0.033) | (0.032) |
| $Corruption_{t-1}$ | 0.052 | 0.057 | 0.052 | 0.019 | 0.028 | 0.021 | 0.008 |
| | (0.091) | (0.085) | (0.090) | (0.081) | (0.089) | (0.078) | (0.086) |
| $Credit_{t-1}$ | -0.054 | -0.059* | -0.031 | -0.055* | -0.034 | -0.064** | -0.036 |
| | (0.034) | (0.031) | (0.033) | (0.032) | (0.031) | (0.032) | (0.033) |
| Constant | 21.873*** | 20.025*** | 18.404*** | 19.318*** | 17.525*** | 20.683*** | 19.478*** |
| | (4.187) | (4.259) | (4.097) | (4.123) | (3.870) | (3.812) | (3.677) |
| Year Effects | Yes | Yes | No | Yes | No | Yes | No |
| Observations, Countries | 206, 52 | 206, 52 | 206, 52 | 200, 52 | 200, 52 | 195, 52 | 195, 52 |
| $\alpha_t = \eta_t = 0$ | [0.269] | [0.345] | | [0.454] | | [0.230] | |
| Hausman test | [0.364] | [0.053] | [0.001] | [0.880] | [0.065] | [0.549] | [0.005] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.046 | 0.034 | 0.001 | 0.065 | 0.007 | 0.040 | 0.001 |
| Between $R^2$ | 0.225 | 0.383 | 0.391 | 0.451 | 0.439 | 0.405 | 0.371 |
| Overall $R^2$ | 0.316 | 0.369 | 0.294 | 0.363 | 0.293 | 0.337 | 0.248 |
| Chi-squared | 26.360 | 34.213 | 13.437 | 51.810 | 33.052 | 52.584 | 29.022 |

*Notes:* Results correspond to Hypothesis 1. Total early-stage entrepreneurship rate is the dependent variable. Model (1) incorporates only control variables. While models (1), (2), (4) and (6) include time effects, models (3), (5) and (7) do not. Control variables are lagged by one year. We utilize net ODA received relative to GNI (%) in all models instead of AIDpc, and this variable is added into the models with one-year (models 2 and 3), two-year (models 4 and 5) and three-year (models 6 and 7) lag lengths. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-7:** Robustness analysis VII: Disaggregated results with new business ownership rate

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| lnAIDpc Education$_{t-1}$ | -0.019 | | | | | | | | |
| | (0.673) | | | | | | | | |
| lnAIDpc Education$_{t-2}$ | | -0.066 | | | | | | | |
| | | (0.542) | | | | | | | |
| lnAIDpc Education$_{t-3}$ | | | -0.214 | | | | | | |
| | | | (0.495) | | | | | | |
| lnAIDpc Infrastructure$_{t-1}$ | | | | 0.111 | | | | | |
| | | | | (0.181) | | | | | |
| lnAIDpc Infrastructure$_{t-2}$ | | | | | 0.212 | | | | |
| | | | | | (0.145) | | | | |
| lnAIDpc Infrastructure$_{t-3}$ | | | | | | 0.283* | | | |
| | | | | | | (0.152) | | | |
| lnAIDpc Institutions$_{t-1}$ | | | | | | | -0.149 | | |
| | | | | | | | (0.248) | | |
| lnAIDpc Institutions$_{t-2}$ | | | | | | | | -0.304 | |
| | | | | | | | | (0.214) | |
| lnAIDpc Institutions$_{t-3}$ | | | | | | | | | -0.087 |
| | | | | | | | | | (0.210) |
| lnAIDpc$_{t-1}$ | 0.890* | | | 0.793 | | | 1.134** | | |
| | (0.501) | | | (0.575) | | | (0.537) | | |
| lnAIDpc$_{t-2}$ | | 1.185*** | | | 1.020** | | | 1.516*** | |
| | | (0.358) | | | (0.437) | | | (0.399) | |
| lnAIDpc$_{t-3}$ | | | 0.980** | | | 0.629 | | | 1.015** |
| | | | (0.413) | | | (0.510) | | | (0.488) |
| GDPpc$_{t-1}$ | -0.001*** | -0.001*** | -0.001*** | -0.001*** | -0.001** | -0.001** | -0.001*** | -0.001*** | -0.001*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| FDI$_{t-1}$ | 0.050 | 0.023 | 0.062 | 0.049 | 0.015 | 0.044 | 0.059 | 0.041 | 0.061 |
| | (0.118) | (0.113) | (0.110) | (0.119) | (0.111) | (0.111) | (0.117) | (0.111) | (0.111) |
| Registration$_{t-1}$ | 0.021 | 0.017 | 0.009 | 0.022 | 0.018 | 0.011 | 0.021 | 0.017 | 0.010 |
| | (0.027) | (0.026) | (0.024) | (0.026) | (0.026) | (0.023) | (0.026) | (0.026) | (0.023) |
| Corruption $_{t-1}$ | 0.023 | -0.014 | -0.027 | 0.023 | -0.014 | -0.024 | 0.021 | -0.015 | -0.025 |
| | (0.049) | (0.049) | (0.047) | (0.050) | (0.049) | (0.049) | (0.050) | (0.047) | (0.047) |
| Credit$_{t-1}$ | -0.009 | -0.005 | -0.009 | -0.008 | -0.007 | -0.011 | -0.012 | -0.009 | -0.009 |
| | (0.022) | (0.022) | (0.021) | (0.021) | (0.022) | (0.021) | (0.022) | (0.022) | (0.021) |
| Constant | 7.968*** | 7.954*** | 9.326*** | 8.140*** | 8.267*** | 9.799*** | 7.082*** | 6.614*** | 8.732*** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (2.601) | (2.405) | (2.313) | (2.881) | (2.628) | (2.503) | (2.671) | (2.476) | (2.534) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations, Countries | 209, 53 | 203, 53 | 197, 53 | 209, 53 | 202, 52 | 196, 53 | 209, 53 | 203, 53 | 197, 53 |
| $\alpha_t = \eta_t = 0$ | [0.143] | [0.130] | [0.145] | [0.339] | [0.222] | [0.172] | [0.167] | [0.059] | [0.180] |
| Hausman test | [0.997] | [0.996] | [0.971] | [0.997] | [0.991] | [0.927] | [0.998] | [0.996] | [0.937] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.071 | 0.080 | 0.050 | 0.068 | 0.079 | 0.056 | 0.079 | 0.092 | 0.048 |
| Between $R^2$ | 0.251 | 0.257 | 0.247 | 0.255 | 0.259 | 0.243 | 0.249 | 0.256 | 0.249 |
| Overall $R^2$ | 0.292 | 0.270 | 0.267 | 0.291 | 0.265 | 0.259 | 0.293 | 0.280 | 0.264 |
| Chi-squared | 35.419 | 46.922 | 46.154 | 37.181 | 44.998 | 46.919 | 34.334 | 47.262 | 37.174 |

*Notes:* Results correspond to Hypothesis 2. New business ownership rate is the dependent variable. While the coefficient estimates on educational aid are presented in models (1 through 3), estimates for aid to physical infrastructure and institutional reforms are included in models (4 through 6) and (7 through 9), respectively. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 1, 4 and 7), two-year (models 2, 5 and 8) and three-year lag (models 3, 6 and 9) lengths. $\ln AIDpc_{t-1}$ (also its two- and three-year lagged versions) measures the proportion of aid after the shares of respective sectoral aid flows are subtracted from total aid inflows. All models include time effects. Control variables are lagged by one year. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-8:** Robustness analysis VIII: Disaggregated results with additional control variables

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| lnAIDpc Education$_{t-1}$ | 0.771 | | | | | | | | |
| | (1.024) | | | | | | | | |
| lnAIDpc Education$_{t-2}$ | | 0.695 | | | | | | | |
| | | (1.049) | | | | | | | |
| lnAIDpc Education$_{t-3}$ | | | -0.649 | | | | | | |
| | | | (0.919) | | | | | | |
| lnAIDpc Infrastructure$_{t-1}$ | | | | 0.072 | | | | | |
| | | | | (0.292) | | | | | |
| lnAIDpc Infrastructure$_{t-2}$ | | | | | 0.578** | | | | |
| | | | | | (0.276) | | | | |
| lnAIDpc Infrastructure$_{t-3}$ | | | | | | 0.666* | | | |
| | | | | | | (0.365) | | | |
| lnAIDpc Institutions$_{t-1}$ | | | | | | | -0.134 | | |
| | | | | | | | (0.499) | | |
| lnAIDpc Institutions$_{t-2}$ | | | | | | | | -0.506 | |
| | | | | | | | | (0.452) | |
| lnAIDpc Institutions$_{t-3}$ | | | | | | | | | -0.417 |
| | | | | | | | | | (0.382) |
| lnAIDpc$_{t-1}$ | 0.955 | | | 1.200 | | | 1.510 | | |
| | (0.853) | | | (1.160) | | | (1.018) | | |
| lnAIDpc$_{t-2}$ | | 1.449* | | | 1.270 | | | 2.265** | |
| | | (0.786) | | | (1.024) | | | (0.976) | |
| lnAIDpc$_{t-3}$ | | | 1.956*** | | | 1.169 | | | 2.066** |
| | | | (0.756) | | | (1.012) | | | (0.839) |
| lnGDPpc$_{t-1}$ | -3.654*** | -3.764*** | -3.138*** | -3.702*** | -3.310** | -2.772** | -3.576*** | -3.651*** | -3.247*** |
| | (1.188) | (1.262) | (1.127) | (1.217) | (1.324) | (1.130) | (1.186) | (1.223) | (1.073) |
| GDP growth$_{t-1}$ | -0.030 | 0.025 | 0.054 | -0.028 | 0.120 | 0.045 | -0.031 | 0.012 | 0.048 |
| | (0.049) | (0.072) | (0.071) | (0.050) | (0.135) | (0.066) | (0.049) | (0.074) | (0.076) |
| FDI$_{t-1}$ | 0.206 | 0.162 | 0.231 | 0.220 | 0.141 | 0.189 | 0.229 | 0.206 | 0.242 |
| | (0.173) | (0.176) | (0.160) | (0.179) | (0.171) | (0.169) | (0.185) | (0.177) | (0.163) |
| Registration$_{t-1}$ | 0.022 | 0.014 | -0.008 | 0.020 | 0.016 | -0.004 | 0.019 | 0.011 | -0.005 |
| | (0.046) | (0.045) | (0.037) | (0.044) | (0.045) | (0.038) | (0.045) | (0.043) | (0.036) |
| Corruption $_{t-1}$ | 0.080 | 0.042 | 0.020 | 0.079 | 0.031 | 0.024 | 0.073 | 0.032 | 0.029 |
| | (0.074) | (0.075) | (0.067) | (0.075) | (0.072) | (0.070) | (0.073) | (0.072) | (0.069) |
| Credit$_{t-1}$ | -0.035 | -0.029 | -0.041 | -0.035 | -0.037 | -0.048 | -0.040 | -0.037 | -0.043 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (0.028) | (0.030) | (0.028) | (0.028) | (0.028) | (0.030) | (0.029) | (0.031) | (0.029) |
| Landlocked dummy | 3.068 | 2.357 | 2.822 | 3.140 | 2.676 | 2.646 | 3.164 | 2.596 | 2.584 |
| | (3.682) | (3.844) | (4.157) | (3.706) | (3.800) | (4.018) | (3.651) | (3.744) | (3.920) |
| lnDistance from equator | -2.695*** | -2.689*** | -2.580*** | -2.662*** | -2.576** | -2.842*** | -2.662*** | -2.646*** | -2.709*** |
| | (1.024) | (0.998) | (0.976) | (1.010) | (1.014) | (1.031) | (1.001) | (0.992) | (1.003) |
| Constant | 48.792*** | 49.212*** | 45.235*** | 49.078*** | 46.362*** | 44.491*** | 47.268*** | 46.286*** | 44.623*** |
| | (9.437) | (9.517) | (9.295) | (9.453) | (10.189) | (9.680) | (9.591) | (9.497) | (8.858) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations, Countries | 208, 52 | 202, 52 | 196, 52 | 208, 52 | 201, 51 | 195, 52 | 208, 52 | 202, 52 | 196, 52 |
| $\alpha_t = \eta_t = 0$ | [0.615] | [0.386] | [0.125] | [0.610] | [0.217] | [0.067] | [0.580] | [0.453] | [0.128] |
| Hausman test | [0.998] | [0.994] | [0.993] | [0.998] | [0.379] | [0.990] | [0.999] | [0.989] | [0.995] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.101 | 0.115 | 0.124 | 0.088 | 0.130 | 0.140 | 0.095 | 0.115 | 0.120 |
| Between $R^2$ | 0.375 | 0.390 | 0.359 | 0.379 | 0.391 | 0.360 | 0.377 | 0.395 | 0.373 |
| Overall $R^2$ | 0.392 | 0.389 | 0.383 | 0.404 | 0.405 | 0.363 | 0.406 | 0.414 | 0.393 |
| Chi-squared | 67.770 | 97.422 | 94.398 | 71.032 | 113.391 | 92.481 | 72.259 | 91.140 | 85.805 |

*Notes:* Results correspond to Hypothesis 2. Total early-stage entrepreneurship rate is the dependent variable. All models include GDP growth, landlocked dummy and distance from equator (in absolute latitude degrees) as additional controls. While the coefficient estimates on educational aid are presented in models (1 through 3), estimates for aid to physical infrastructure and institutional reforms are included in models (4 through 6) and (7 through 9), respectively. GDPpc, distance from equator and aid variables are subject to logarithmic transformation, and the latter are added into the models with one-year (models 1, 4 and 7), two-year (models 2, 5 and 8) and three-year lag (models 3, 6 and 9) lengths. $\ln AIDpc_{t-1}$ (also its two- and three-year lagged versions) measures the proportion of aid after the shares of respective sectoral aid flows are subtracted from total aid inflows. All models include time effects. Control variables except landlocked dummy and distance from equator are lagged by one year. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-9:** Robustness analysis IX: Disaggregated results with nonlinear terms

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| lnAIDpc Education$_{t-1}$ | 0.838 | | | | | | | | |
| | (0.951) | | | | | | | | |
| lnAIDpc Education$_{t-2}$ | | 0.619 | | | | | | | |
| | | (1.001) | | | | | | | |
| lnAIDpc Education$_{t-3}$ | | | -0.833 | | | | | | |
| | | | (0.895) | | | | | | |
| lnAIDpc Infrastructure$_{t-1}$ | | | | -0.011 | | | | | |
| | | | | (0.295) | | | | | |
| lnAIDpc Infrastructure$_{t-2}$ | | | | | 0.519* | | | | |
| | | | | | (0.265) | | | | |
| lnAIDpc Infrastructure$_{t-3}$ | | | | | | 0.608* | | | |
| | | | | | | (0.361) | | | |
| lnAIDpc Institutions$_{t-1}$ | | | | | | | -0.105 | | |
| | | | | | | | (0.467) | | |
| lnAIDpc Institutions$_{t-2}$ | | | | | | | | -0.516 | |
| | | | | | | | | (0.445) | |
| lnAIDpc Institutions$_{t-3}$ | | | | | | | | | -0.402 |
| | | | | | | | | | (0.371) |
| lnAIDpc$_{t-1}$ | 1.084 | | | 1.528 | | | 1.639* | | |
| | (0.799) | | | (1.049) | | | (0.921) | | |
| lnAIDpc$_{t-2}$ | | 1.689** | | | 1.577* | | | 2.472*** | |
| | | (0.728) | | | (0.882) | | | (0.854) | |
| lnAIDpc$_{t-3}$ | | | 2.337*** | | | 1.550* | | | 2.356*** |
| | | | (0.691) | | | (0.904) | | | (0.756) |
| GDPpc$_{t-1}$ | -0.003*** | -0.003*** | -0.003*** | -0.003*** | -0.003** | -0.002*** | -0.003*** | -0.003*** | -0.003*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| GDPpc$_{t-1}$ * GDPpc$_{t-1}$ | 0.000** | 0.000** | 0.000** | 0.000** | 0.000* | 0.000** | 0.000** | 0.000** | 0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| GDP growth$_{t-1}$ | -0.032 | 0.014 | 0.045 | -0.031 | 0.121 | 0.037 | -0.033 | 0.001 | 0.038 |
| | (0.052) | (0.075) | (0.071) | (0.051) | (0.143) | (0.068) | (0.052) | (0.075) | (0.077) |
| FDI$_{t-1}$ | 0.463* | 0.453* | 0.538** | 0.478* | 0.387 | 0.485** | 0.485* | 0.503** | 0.538*** |
| | (0.242) | (0.252) | (0.210) | (0.256) | (0.266) | (0.227) | (0.252) | (0.239) | (0.206) |
| FDI$_{t-1}$ * FDI$_{t-1}$ | -0.014** | -0.015** | -0.016** | -0.014* | -0.012* | -0.016** | -0.014** | -0.015** | -0.015** |
| | (0.007) | (0.007) | (0.006) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.006) |
| Registration$_{t-1}$ | 0.030 | 0.023 | 0.001 | 0.028 | 0.025 | 0.007 | 0.026 | 0.021 | 0.006 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (0.044) | (0.044) | (0.037) | (0.042) | (0.044) | (0.038) | (0.043) | (0.042) | (0.035) |
| Corruption $_{t-1}$ | 0.067 | 0.023 | -0.002 | 0.066 | 0.015 | 0.001 | 0.061 | 0.015 | 0.007 |
| | (0.084) | (0.085) | (0.076) | (0.086) | (0.080) | (0.078) | (0.083) | (0.080) | (0.076) |
| Credit$_{t-1}$ | -0.047 | -0.042 | -0.053* | -0.046 | -0.051* | -0.060* | -0.051* | -0.051* | -0.056* |
| | (0.028) | (0.030) | (0.029) | (0.029) | (0.029) | (0.031) | (0.029) | (0.030) | (0.030) |
| Constant | 21.520*** | 20.462*** | 20.373*** | 21.130*** | 20.468*** | 21.084*** | 20.584*** | 18.366*** | 18.811*** |
| | (4.760) | (4.280) | (3.998) | (5.248) | (4.723) | (4.406) | (4.940) | (4.693) | (4.335) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations, Countries | 208, 52 | 202, 52 | 196, 52 | 208, 52 | 201, 51 | 195, 52 | 208, 52 | 202, 52 | 196, 52 |
| $\alpha_t = \eta_t = 0$ | [0.321] | [0.188] | [0.018] | [0.315] | [0.076] | [0.007] | [0.305] | [0.218] | [0.022] |
| Hausman test | [0.369] | [0.374] | [0.933] | [0.269] | [0.045] | [0.350] | [0.313] | [0.310] | [0.867] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.120 | 0.128 | 0.131 | 0.105 | 0.137 | 0.146 | 0.111 | 0.125 | 0.125 |
| Between $R^2$ | 0.294 | 0.310 | 0.305 | 0.308 | 0.316 | 0.292 | 0.301 | 0.324 | 0.314 |
| Overall $R^2$ | 0.318 | 0.318 | 0.325 | 0.335 | 0.336 | 0.285 | 0.337 | 0.349 | 0.324 |
| Chi-squared | 59.952 | 78.531 | 74.932 | 61.122 | 79.416 | 70.915 | 59.125 | 71.719 | 72.397 |

*Notes:* Results correspond to Hypothesis 2. Total early-stage entrepreneurship rate is the dependent variable. All models include GDP growth, and nonlinear terms of GDPpc and FDI as additional control variables. While the coefficient estimates on educational aid are presented in models (1 through 3), estimates for aid to physical infrastructure and institutional reforms are included in models (4 through 6) and (7 through 9), respectively. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 1, 4 and 7), two-year (models 2, 5 and 8) and three-year lag (models 3, 6 and 9) lengths. lnAIDpc$_{t-1}$ (also its two- and three-year lagged versions) measures the proportion of aid after the shares of respective sectoral aid flows are subtracted from total aid inflows. All models include time effects. Control variables are lagged by one year. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-10:** Robustness analysis X: Results with subcategories of aid to education

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| lnAIDpc High Education$_{t-1}$ | -1.100 | | | | | | | | |
| | (1.099) | | | | | | | | |
| lnAIDpc High Education$_{t-2}$ | | -0.773 | | | | | | | |
| | | (0.804) | | | | | | | |
| lnAIDpc High Education$_{t-3}$ | | | -0.549 | | | | | | |
| | | | (0.866) | | | | | | |
| lnAIDpc Managerial Training$_{t-1}$ | | | | 0.517** | | | | | |
| | | | | (0.262) | | | | | |
| lnAIDpc Managerial Training$_{t-1}$ | | | | | 0.266 | | | | |
| | | | | | (0.247) | | | | |
| lnAIDpc Managerial Training$_{t-1}$ | | | | | | -0.283 | | | |
| | | | | | | (0.196) | | | |
| lnAIDpc Vocational Training$_{t-1}$ | | | | | | | 0.002 | | |
| | | | | | | | (0.272) | | |
| lnAIDpc Vocational Training$_{t-2}$ | | | | | | | | -0.366 | |
| | | | | | | | | (0.278) | |
| lnAIDpc Vocational Training$_{t-3}$ | | | | | | | | | -0.652** |
| | | | | | | | | | (0.300) |
| lnAIDpc$_{t-1}$ | 2.106** | | | 1.795** | | | 2.296*** | | |
| | (0.832) | | | (0.916) | | | (0.891) | | |
| lnAIDpc$_{t-2}$ | | 2.399*** | | | 1.888*** | | | 3.004*** | |
| | | (0.662) | | | (0.694) | | | (0.859) | |
| lnAIDpc$_{t-3}$ | | | 2.243*** | | | 1.775** | | | 3.005*** |
| | | | (0.663) | | | (0.754) | | | (0.870) |
| GDPpc$_{t-1}$ | -0.001** | -0.001** | -0.001** | -0.001*** | -0.001*** | -0.001** | -0.001*** | -0.001*** | -0.001*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| FDI$_{t-1}$ | 0.190 | 0.118 | 0.215 | 0.452** | 0.347 | 0.364* | 0.195 | 0.141 | 0.182 |
| | (0.186) | (0.183) | (0.181) | (0.230) | (0.234) | (0.196) | (0.189) | (0.195) | (0.197) |
| Registration$_{t-1}$ | 0.024 | 0.014 | -0.002 | 0.084* | 0.065 | 0.005 | 0.061 | 0.058 | 0.041 |
| | (0.043) | (0.043) | (0.036) | (0.045) | (0.040) | (0.040) | (0.044) | (0.041) | (0.034) |
| Corruption $_{t-1}$ | 0.033 | -0.024 | -0.030 | -0.016 | 0.010 | -0.028 | 0.039 | -0.017 | 0.008 |
| | (0.072) | (0.071) | (0.068) | (0.072) | (0.069) | (0.067) | (0.074) | (0.072) | (0.073) |
| Credit$_{t-1}$ | -0.055** | -0.045 | -0.063** | -0.059** | -0.078** | -0.079*** | -0.067** | -0.059* | -0.066** |
| | (0.026) | (0.029) | (0.029) | (0.029) | (0.032) | (0.031) | (0.029) | (0.032) | (0.031) |
| Constant | 14.938*** | 15.743*** | 17.226*** | 18.103*** | 17.497*** | 17.398*** | 15.362*** | 13.655*** | 12.611*** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (4.537) | (4.045) | (3.551) | (4.437) | (4.610) | (4.325) | (4.567) | (4.367) | (4.282) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations, Countries | 209, 53 | 203, 53 | 197, 53 | 197, 49 | 192, 50 | 186, 51 | 205, 50 | 198, 50 | 192, 51 |
| $\alpha_t = \eta_t = 0$ | [0.319] | [0.347] | [0.197] | [0.062] | [0.048] | [0.035] | [0.127] | [0.076] | [0.017] |
| Hausman test | [0.151] | [0.173] | [0.128] | [0.266] | [0.264] | [0.601] | [0.744] | [0.224] | [0.370] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.060 | 0.078 | 0.086 | 0.085 | 0.080 | 0.108 | 0.059 | 0.083 | 0.102 |
| Between $R^2$ | 0.307 | 0.299 | 0.271 | 0.437 | 0.432 | 0.274 | 0.424 | 0.449 | 0.397 |
| Overall $R^2$ | 0.331 | 0.306 | 0.269 | 0.368 | 0.358 | 0.266 | 0.341 | 0.349 | 0.337 |
| Chi-squared | 55.430 | 76.523 | 52.578 | 73.037 | 87.062 | 60.956 | 64.485 | 75.992 | 63.521 |

*Notes:* Results correspond to the effects of the subcategories of educational aid on total early-stage entrepreneurship rate. While the coefficients for higher education are presented in models (1 through 3), the estimates for advanced technical & managerial training and for vocational training are included in models (4 through 6) and (7 through 9), respectively. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 1, 4 and 7), two-year (models 2, 5 and 8) and three-year lag (models 3, 6 and 9) lengths. $\ln AIDpc_{t-1}$ (also its two- and three-year lagged versions) measures the proportion of aid after the shares of respective educational aid flows are subtracted from total aid inflows. All models include time effects. Control variables are lagged by one year. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-11:** Robustness analysis XI: Results with subcategories of aid to physical infrastructure

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| lnAIDpc Transportation$_{t-1}$ | 0.282 | | | | | | | | |
| | (0.264) | | | | | | | | |
| lnAIDpc Transportation$_{t-2}$ | | 0.484** | | | | | | | |
| | | (0.221) | | | | | | | |
| lnAIDpc Transportation$_{t-3}$ | | | 0.342 | | | | | | |
| | | | (0.276) | | | | | | |
| lnAIDpc Communication$_{t-1}$ | | | | 0.154 | | | | | |
| | | | | (0.322) | | | | | |
| lnAIDpc Communication$_{t-2}$ | | | | | -0.095 | | | | |
| | | | | | (0.581) | | | | |
| lnAIDpc Communication$_{t-3}$ | | | | | | 0.535 | | | |
| | | | | | | (0.476) | | | |
| lnAIDpc Energy$_{t-1}$ | | | | | | | 0.169 | | |
| | | | | | | | (0.159) | | |
| lnAIDpc Energy$_{t-2}$ | | | | | | | | 0.191 | |
| | | | | | | | | (0.254) | |
| lnAIDpc Energy$_{t-3}$ | | | | | | | | | 0.358 |
| | | | | | | | | | (0.289) |
| lnAIDpc$_{t-1}$ | 1.769* | | | 1.658* | | | 1.642 | | |
| | (0.976) | | | (0.856) | | | (1.052) | | |
| lnAIDpc$_{t-2}$ | | 1.805** | | | 2.663*** | | | 2.216** | |
| | | (0.875) | | | (1.030) | | | (0.932) | |
| lnAIDpc$_{t-3}$ | | | 1.921* | | | 1.925** | | | 1.918** |
| | | | (0.986) | | | (0.943) | | | (0.913) |
| GDPpc$_{t-1}$ | -0.001* | -0.001 | -0.001 | -0.001** | -0.001* | -0.001* | -0.001** | -0.001* | -0.001** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| FDI$_{t-1}$ | 0.168 | 0.224 | 0.186 | 0.173 | 0.139 | 0.250 | 0.176 | 0.132 | 0.228 |
| | (0.191) | (0.239) | (0.187) | (0.193) | (0.205) | (0.202) | (0.195) | (0.200) | (0.203) |
| Registration$_{t-1}$ | 0.019 | 0.022 | 0.001 | 0.024 | 0.018 | -0.001 | 0.017 | 0.014 | 0.002 |
| | (0.045) | (0.050) | (0.044) | (0.045) | (0.045) | (0.039) | (0.045) | (0.043) | (0.040) |
| Corruption $_{t-1}$ | 0.036 | 0.002 | -0.025 | 0.041 | -0.015 | -0.037 | 0.022 | -0.024 | -0.008 |
| | (0.075) | (0.086) | (0.079) | (0.076) | (0.086) | (0.080) | (0.081) | (0.087) | (0.078) |
| Credit$_{t-1}$ | -0.061** | -0.055* | -0.069** | -0.060** | -0.048 | -0.067** | -0.059** | -0.055* | -0.071** |
| | (0.030) | (0.031) | (0.033) | (0.028) | (0.033) | (0.033) | (0.029) | (0.033) | (0.034) |
| Constant | 16.539*** | 16.984*** | 18.552*** | 17.339*** | 14.299** | 19.577*** | 17.494*** | 17.003*** | 18.296*** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (4.969) | (4.684) | (4.699) | (4.618) | (6.719) | (5.186) | (5.530) | (5.175) | (4.176) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations, Countries | 202, 52 | 194, 50 | 189, 51 | 207, 53 | 198, 52 | 191, 52 | 207, 53 | 196, 51 | 190, 52 |
| $\alpha_t = \eta_t = 0$ | [0.326] | [0.187] | [0.288] | [0.399] | [0.285] | [0.223] | [0.286] | [0.471] | [0.219] |
| Hausman test | [0.860] | [0.427] | [0.809] | [0.310] | [0.843] | [0.743] | [0.903] | [0.910] | [0.877] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.078 | 0.111 | 0.093 | 0.063 | 0.097 | 0.112 | 0.066 | 0.087 | 0.109 |
| Between $R^2$ | 0.238 | 0.255 | 0.213 | 0.266 | 0.265 | 0.252 | 0.260 | 0.271 | 0.251 |
| Overall $R^2$ | 0.260 | 0.274 | 0.221 | 0.273 | 0.253 | 0.230 | 0.263 | 0.256 | 0.242 |
| Chi-squared | 57.151 | 63.668 | 42.279 | 41.847 | 50.676 | 50.002 | 58.687 | 49.607 | 47.328 |

*Notes:* Results correspond to the effects of the subcategories of aid supporting physical infrastructure on total early-stage entrepreneurship rate. While the coefficients for transport and storage are presented in models (1 through 3), the estimates for communication, and for energy generation and supply are included in models (4 through 6) and (7 through 9), respectively. Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 1, 4 and 7), two-year (models 2, 5 and 8) and three-year lag (models 3, 6 and 9) lengths. $\ln AIDpc_{t-1}$ (also its two- and three-year lagged versions) measures the proportion of aid after the shares of respective infrastructure aid are subtracted from total aid inflows. All models include time effects. Control variables are lagged by one year. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-12:** Robustness analysis XII: Results with subcategories of aid to institutional reforms

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| lnAIDpc Legal Development$_{t-1}$ | 0.313 | | | | | |
| | (0.404) | | | | | |
| lnAIDpc Legal Development$_{t-2}$ | | -0.351 | | | | |
| | | (0.350) | | | | |
| lnAIDpc Legal Development$_{t-3}$ | | | -0.355 | | | |
| | | | (0.311) | | | |
| lnAIDpc Business Support$_{t-1}$ | | | | -0.173 | | |
| | | | | (0.365) | | |
| lnAIDpc Business Support$_{t-2}$ | | | | | -0.204 | |
| | | | | | (0.339) | |
| lnAIDpc Business Support$_{t-3}$ | | | | | | -0.125 |
| | | | | | | (0.459) |
| lnAIDpc$_{t-1}$ | 1.607* | | | 2.066** | | |
| | (0.897) | | | (1.023) | | |
| lnAIDpc$_{t-2}$ | | 2.492*** | | | 2.663*** | |
| | | (0.860) | | | (0.963) | |
| lnAIDpc$_{t-3}$ | | | 2.500*** | | | 2.478*** |
| | | | (0.763) | | | (0.957) |
| GDPpc$_{t-1}$ | -0.001** | -0.001** | -0.001* | -0.001* | -0.001 | -0.001 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| FDI$_{t-1}$ | 0.169 | 0.151 | 0.196 | 0.183 | 0.119 | 0.198 |
| | (0.205) | (0.193) | (0.168) | (0.184) | (0.190) | (0.185) |
| Registration$_{t-1}$ | 0.025 | 0.015 | -0.006 | 0.023 | 0.015 | 0.004 |
| | (0.046) | (0.045) | (0.037) | (0.046) | (0.045) | (0.040) |
| Corruption $_{t-1}$ | 0.052 | -0.030 | -0.050 | 0.037 | -0.016 | -0.057 |
| | (0.086) | (0.079) | (0.077) | (0.078) | (0.079) | (0.074) |
| Credit$_{t-1}$ | -0.052* | -0.055* | -0.074** | -0.065** | -0.056* | -0.067** |
| | (0.030) | (0.032) | (0.034) | (0.030) | (0.033) | (0.033) |
| Constant | 16.979*** | 15.575*** | 17.236*** | 15.338*** | 14.721*** | 17.378*** |
| | (4.711) | (4.917) | (4.209) | (5.666) | (5.560) | (5.154) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations, Countries | 209, 53 | 202, 53 | 195, 52 | 205, 51 | 199, 51 | 192, 51 |
| $\alpha_t = \eta_t = 0$ | [0.309] | [0.378] | [0.156] | [0.509] | [0.314] | [0.000] |

| | | | | | | |
|---|---|---|---|---|---|---|
| Hausman test | [0.826] | [0.924] | [0.957] | [0.368] | [0.481] | [0.401] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.074 | 0.089 | 0.113 | 0.067 | 0.085 | 0.113 |
| Between $R^2$ | 0.251 | 0.272 | 0.244 | 0.236 | 0.253 | 0.216 |
| Overall $R^2$ | 0.260 | 0.276 | 0.236 | 0.275 | 0.259 | 0.233 |
| Chi-squared | 43.304 | 46.761 | 51.675 | 39.417 | 43.760 | 58.822 |

*Notes:* Results correspond to the effects of the subcategories of aid supporting institutional reforms on total early-stage entrepreneurship rate. While the coefficients for legal and judicial development are presented in models (1 through 3), the estimates for business support services and institutions are included in models (4 through 6). Aid variables are subject to logarithmic transformation, and they are added into the models with one-year (models 1 and 3), two-year (models 2 and 4) and three-year lag (models 3 and 6) lengths. $\ln AIDpc_{t-1}$ (also its two- and three-year lagged versions) measures the proportion of aid after the shares of respective institutional aid are subtracted from total aid inflows. All models include time effects. Control variables are lagged by one year. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

**Table 5-A-13:** Robustness analysis XIII: Additional estimates with factor scores

| | TOTAL EARLY STAGE ENTREPRENEURSHIP RATE | | | | NASCENT ENTREPRENEURSHIP RATE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Exclusion (1) | Aggregation (2) | Exclusion (3) | Aggregation (4) | Exclusion (5) | Aggregation (6) | Exclusion (7) | Aggregation (8) | Exclusion (9) | Aggregation (10) |
| Factor $I_{t-1}$ | 2.452* | 2.169* | 3.017** | 2.573** | 2.373*** | 2.286*** | 1.971** | 1.908** | 2.308*** | 2.169** |
| | (1.359) | (1.287) | (1.262) | (1.254) | (0.834) | (0.884) | (0.838) | (0.860) | (0.782) | (0.851) |
| Factor $II_{t-1}$ | 0.756 | 0.789 | 0.789 | 0.597 | 0.764 | 0.574 | 1.062 | 0.830 | 1.160 | 0.784 |
| | (1.625) | (1.493) | (1.518) | (1.396) | (1.091) | (1.011) | (1.107) | (1.008) | (1.062) | (0.960) |
| Factor $III_{t-1}$ | 0.650 | 0.081 | 0.717 | -0.048 | 0.551 | -0.199 | 0.389 | 0.094 | 0.387 | 0.011 |
| | (0.951) | (1.032) | (0.875) | (0.965) | (0.610) | (0.776) | (0.627) | (0.737) | (0.600) | (0.710) |
| $lnGDPpc_{t-1}$ | -3.647** | -4.111*** | | | | | -0.684 | -0.825 | | |
| | (1.434) | (1.255) | | | | | (0.944) | (0.923) | | |
| $GDPpc_{t-1}$ | | | -0.004*** | -0.004*** | 0.000 | 0.000 | | | -0.002* | -0.002** |
| | | | (0.002) | (0.001) | (0.000) | (0.000) | | | (0.001) | (0.001) |
| $GDPpc_{t-1}$ * $GDPpc_{t-1}$ | | | 0.000** | 0.000** | | | | | 0.000* | 0.000** |
| | | | (0.000) | (0.000) | | | | | (0.000) | (0.000) |
| GDP $growth_{t-1}$ | 0.139 | 0.118 | 0.067 | 0.046 | | | 0.224** | 0.207** | 0.209** | 0.191** |
| | (0.144) | (0.142) | (0.152) | (0.148) | | | (0.088) | (0.086) | (0.093) | (0.090) |
| $FDI_{t-1}$ | 0.259 | 0.247 | 0.539** | 0.538** | 0.131 | 0.146 | 0.123 | 0.126 | 0.110 | 0.114 |
| | (0.190) | (0.181) | (0.267) | (0.260) | (0.116) | (0.110) | (0.112) | (0.109) | (0.227) | (0.220) |
| $FDI_{t-1}$ * $FDI_{t-1}$ | | | -0.014* | -0.014* | | | | | -0.001 | -0.000 |
| | | | (0.008) | (0.008) | | | | | (0.007) | (0.007) |
| $Registration_{t-1}$ | 0.082* | 0.075* | 0.092** | 0.082* | 0.040 | 0.037 | 0.042 | 0.039 | 0.049 | 0.045 |
| | (0.046) | (0.046) | (0.046) | (0.046) | (0.033) | (0.033) | (0.033) | (0.033) | (0.032) | (0.033) |
| $Corruption_{t-1}$ | 0.042 | 0.072 | 0.036 | 0.070 | -0.007 | 0.014 | 0.024 | 0.038 | 0.029 | 0.046 |
| | (0.081) | (0.074) | (0.092) | (0.085) | (0.053) | (0.051) | (0.052) | (0.050) | (0.059) | (0.056) |
| $Credit_{t-1}$ | -0.050 | -0.047 | -0.045 | -0.043 | -0.053** | -0.052** | -0.050** | -0.047* | -0.045* | -0.043* |
| | (0.033) | (0.036) | (0.033) | (0.035) | (0.023) | (0.024) | (0.022) | (0.024) | (0.023) | (0.024) |
| Constant | 44.990*** | 47.976*** | 24.040*** | 23.650*** | 10.995*** | 10.507*** | 14.614** | 15.335** | 11.648*** | 11.266*** |
| | (11.080) | (10.065) | (4.357) | (4.229) | (2.705) | (2.782) | (7.255) | (7.210) | (2.869) | (2.803) |
| Year Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations, Countries | 177, 48 | 181, 48 | 177, 48 | 181, 48 | 178 | 182 | 177, 48 | 181, 48 | 177, 48 | 181, 48 |
| $\alpha_t = \eta_t = 0$ | [0.014] | [0.000] | [0.008] | [0.000] | [0.009] | [0.001] | [0.005] | [0.001] | [0.001] | [0.000] |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hausman test | [0.209] | [0.189] | [0.077] | [0.081] | [0.217] | [0.180] | [0.694] | [0.936] | [0.547] | [0.372] |
| Breusch-Pagan LM test | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Within $R^2$ | 0.085 | 0.078 | 0.158 | 0.131 | 0.108 | 0.131 | 0.128 | 0.125 | 0.176 | 0.162 |
| Between $R^2$ | 0.473 | 0.482 | 0.466 | 0.483 | 0.375 | 0.483 | 0.399 | 0.412 | 0.370 | 0.386 |
| Overall $R^2$ | 0.412 | 0.419 | 0.429 | 0.445 | 0.269 | 0.445 | 0.311 | 0.320 | 0.312 | 0.324 |
| Chi-squared | 124.819 | 125.132 | 115.933 | 143.136 | 96.635 | 143.136 | 98.466 | 84.404 | 139.871 | 128.232 |

*Notes:* While total early-stage entrepreneurship rate is the dependent variable in models (1through 4), the remaining models employ nascent entrepreneurship rate. Factor scores substitute aid variables in all models. The models (1, 3, 5, 7 and 9) employ factors obtained from the exclusion of certain aid categories whereas models (2, 4, 6, 8 and 10) utilize factors based on the aggregation of these categories. GDP pc is subject to logarithmic transformation in models (1, 2, 7 and 8). GDP growth is used as an additional control variable in all models except (5 and 6). The nonlinear terms of GDPpc and FDI are added into the models (3, 4, 9 and 10). Retained factors as well as control variables are lagged one year. Time effects are included in all models. P-values of the joint significance test of the time effects, Hausman and Breusch-Pagan LM tests are in square brackets. Robust standard errors in parentheses: they are heteroskedasticity-consistent, clustered at the country level. *** p<0.01, ** p<0.05, * p<0.10

## Appendix B: Figures and Tables for the Factor Analyses

**Figure 5-B-1:** Scree plot for factor analysis based on the exclusion of aid categories

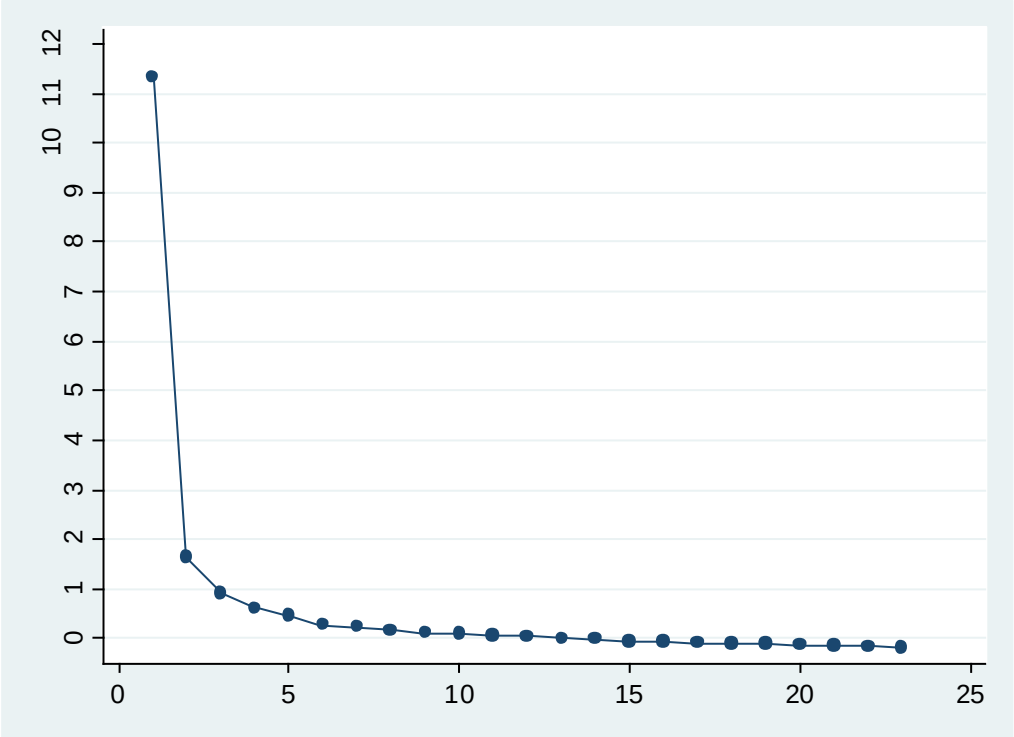



**Figure 5-B-2:** Scree plot for factor analysis based on the aggregation of aid categories

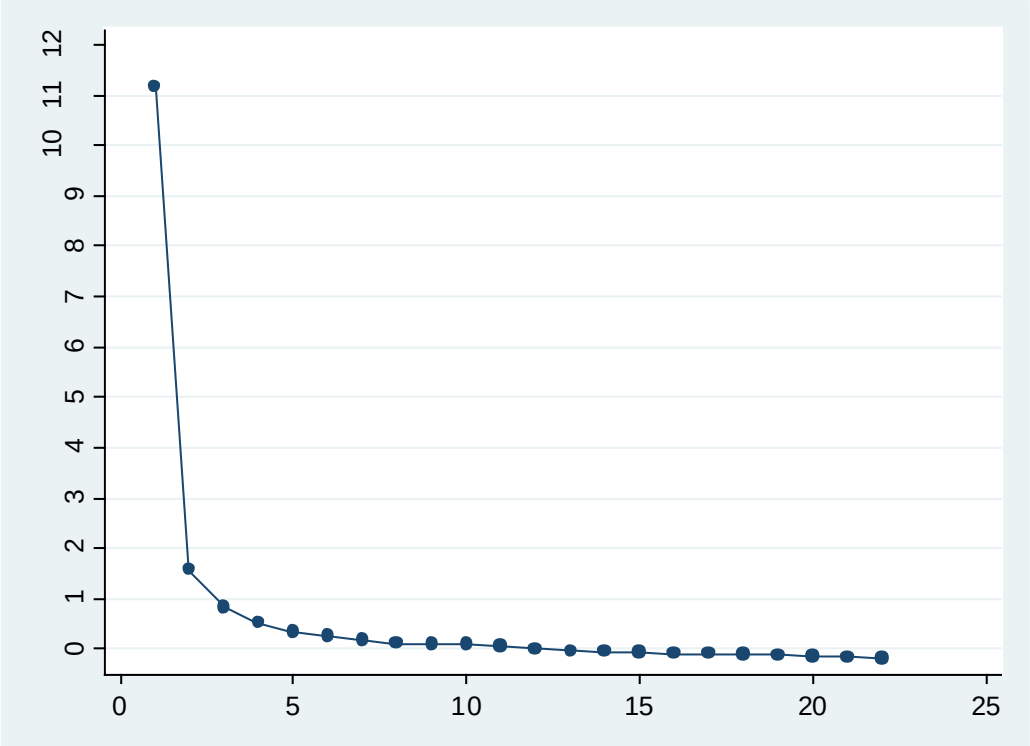


**Table 5-B-1:** Purpose-specific aid categories

| Code | Purpose Category | Model 1 in Table 5-4 | Model 2 in Table 5-4 |
|---|---|---|---|
| 111 | Education, level unspecified | | |
| 112 | Basic education | | |
| 113 | Secondary education | | |
| 114 | Post-secondary education | | |
| 121 | Health, general | | |
| 122 | Basic health | | |
| 130 | Population policies/programmes and reproductive health | | |
| 140 | Water and sanitation | | |
| 151 | Government and civil society, general[a] | | [a] Combined |
| 152 | Conflict prevention and resolution, peace and security[a] | Excluded | [a] Combined |
| 160 | Other social infrastructure and services | | |
| 210 | Transport and storage | | |
| 220 | Communication | | |
| 230 | Energy generation and supply | | |
| 240 | Banking and financial services | | |
| 250 | Business and other services | | |
| 311 | Agriculture[b] | | [b] Combined |
| 312 | Forestry[b] | Excluded | [b] Combined |
| 313 | Fishing[b] | Excluded | [b] Combined |
| 321 | Industry[c] | | [c] Combined |
| 322 | Mineral resources and mining[c] | Excluded | [c] Combined |
| 323 | Construction[c] | Excluded | [c] Combined |
| 331 | Trade policy and regulations and trade-related adjustment[d] | | [d] Combined |
| 332 | Tourism[d] | Excluded | [d] Combined |
| 410 | General environment protection[e] | | [e] Combined |
| 430 | Other multi-sector[e] | | [e] Combined |
| 510 | General budget support[f] | Excluded | [f] Combined |
| 520 | Development food aid/Food security assistance[f] | Excluded | [f] Combined |
| 530 | Other commodity assistance[f] | Excluded | [f] Combined |
| 600 | Action relating to debt[f] | Excluded | [f] Combined |
| 720 | Emergency response[f] | | [f] Combined |
| 730 | Reconstruction relief and rehabilitation[f] | Excluded | [f] Combined |
| 740 | Disaster prevention and preparedness[f] | Excluded | [f] Combined |
| 910 | Administrative cost of donors[g] | | [g] Combined |
| 930 | Refugees in donor countries[g] | Excluded | [g] Combined |
| 998 | Unallocated/Unspecified | | |

*Source:* OECD Statistics (stats.oecd.org)

**Table 5-B-2:** Factor loadings based on the exclusion of aid categories

| Code | Purpose Category | Factor I | Factor II | Factor III |
|---|---|---|---|---|
| 122 | Basic health | **0.875** | 0.031 | 0.145 |
| 130 | Population policies/programmes and reproductive health | **0.802** | -0.011 | 0.152 |
| 112 | Basic education | **0.712** | 0.254 | 0.187 |
| 121 | Health, general | **0.656** | 0.180 | 0.339 |
| 311 | Agriculture | **0.621** | 0.144 | 0.234 |
| 111 | Education, level unspecified | **0.618** | 0.402 | 0.320 |
| 151 | Government and civil society, general | **0.601** | 0.446 | 0.263 |
| 160 | Other social infrastructure and services | **0.516** | 0.441 | 0.050 |
| 720 | Emergency response | **0.482** | 0.310 | 0.091 |
| 430 | Other multi-sector | **0.472** | 0.450 | 0.267 |
| 331 | Trade policy and regulations and trade-related adjustment | **0.380** | 0.360 | 0.358 |
| 114 | Post-secondary education | -0.122 | **0.805** | 0.181 |
| 910 | Administrative cost of donors | 0.308 | **0.751** | 0.133 |
| 113 | Secondary education | 0.395 | **0.484** | 0.212 |
| 140 | Water and sanitation | 0.363 | **0.423** | 0.382 |
| 250 | Business and other services | 0.383 | **0.412** | 0.387 |
| 220 | Communication | 0.305 | **0.381** | 0.359 |
| 410 | General environment protection | 0.171 | **0.335** | 0.287 |
| 998 | Unallocated/Unspecified | 0.184 | **0.197** | 0.041 |
| 230 | Energy generation and supply | 0.240 | 0.206 | **0.690** |
| 240 | Banking and financial services | 0.272 | 0.248 | **0.637** |
| 210 | Transport and storage | 0.368 | 0.095 | **0.548** |
| 321 | Industry | 0.265 | 0.419 | **0.460** |

**Table 5-B-3:** Factor loadings based on the aggregation of aid categories

| Code | Purpose Category | Factor I | Factor II | Factor III |
|---|---|---|---|---|
| 122 | Basic health | **0.867** | 0.008 | 0.141 |
| 130 | Population policies/programmes and reproductive health | **0.765** | -0.042 | 0.257 |
| 112 | Basic education | **0.703** | 0.204 | 0.278 |
| | Combined category: | **0.645** | 0.232 | 0.154 |
| 510 | - General budget support | | | |
| 520 | - Development food aid/Food security assistance | | | |
| 530 | - Other commodity assistance | | | |
| 600 | - Action relating to debt | | | |
| 720 | - Emergency response | | | |
| 730 | - Reconstruction relief and rehabilitation | | | |
| 740 | - Disaster prevention and preparedness | | | |
| 121 | Health, general | **0.634** | 0.179 | 0.151 |
| 111 | Education, level unspecified | **0.599** | 0.350 | 0.323 |
| | Combined category: | **0.560** | 0.397 | 0.542 |
| 151 | - Government and civil society, general | | | |
| 152 | - Conflict prevention and resolution, peace and security | | | |
| | Combined category: | **0.535** | 0.128 | 0.383 |
| 311 | - Agriculture | | | |
| 312 | - Forestry | | | |
| 313 | - Fishing | | | |
| 210 | Transport and storage | **0.383** | 0.098 | 0.155 |
| 230 | Energy generation and supply | **0.241** | 0.192 | 0.099 |
| 114 | Post-secondary education | -0.114 | **0.800** | 0.198 |
| | Combined category: | 0.283 | **0.708** | 0.246 |
| 910 | - Administrative cost of donors | | | |
| 930 | - Refugees in donor countries | | | |
| 113 | Secondary education | 0.360 | **0.442** | 0.397 |
| 140 | Water and sanitation | 0.353 | **0.395** | 0.289 |
| 220 | Communication | 0.284 | **0.353** | 0.314 |
| | Combined category: | 0.345 | 0.388 | **0.604** |
| 410 | - General environment protection | | | |
| 430 | - Other multi-sector | | | |
| 160 | Other social infrastructure and services | 0.461 | 0.360 | **0.595** |
| 250 | Business and other services | 0.326 | 0.315 | **0.562** |
| | Combined category: | 0.370 | 0.388 | **0.420** |
| 331 | - Trade policy and regulations and trade-related adjustment | | | |
| 332 | - Tourism | | | |
| | Combined category: | 0.278 | 0.341 | **0.374** |
| 321 | - Industry | | | |
| 322 | - Mineral resources and mining | | | |
| 323 | - Construction | | | |
| 250 | Business and other services | 0.242 | 0.188 | **0.322** |
| 998 | Unallocated/Unspecified | 0.153 | 0.234 | **0.269** |

## Appendix C: Additional Tables

**Table 5-C-1:** Subcategories of aid to physical infrastructure

| Code | Purpose Category |
|---|---|
| | **PHYSICAL INFRASTRUCTURE** |
| **210** | **Transport and Storage** |
| 21010 | Transport policy and administrative management |
| 21020 | Road transport |
| 21030 | Rail transport |
| 21040 | Water transport |
| 21050 | Air transport |
| 21061 | Storage |
| 21081 | Education and training in transport and storage |
| **220** | **Communication** |
| 22010 | Communications policy and administrative management |
| 22020 | Telecommunications |
| 22030 | Radio/television/print media |
| 22040 | Information and communication technology (ICT) |
| **230** | **Energy Generation and Supply** |
| 23010 | Energy policy and administrative management |
| 23020 | Power generation/non-renewable sources |
| 23030 | Power generation/renewable sources |
| 23040 | Electrical transmission/ distribution |
| 23050 | Gas distribution |
| 23061 | Oil-fired power plants |
| 23062 | Gas-fired power plants |
| 23063 | Coal-fired power plants |
| 23064 | Nuclear power plants |
| 23065 | Hydro-electric power plants |
| 23066 | Geothermal energy |
| 23067 | Solar energy |
| 23068 | Wind power |
| 23069 | Ocean power |
| 23070 | Biomass |
| 23081 | Energy education/training |
| 23082 | Energy research |

*Source:* OECD Statistics (stats.oecd.org)

**Table 5-C-2:** Subcategories of aid to education

| Code | Purpose Category |
|---|---|
| **110** | **EDUCATION** |
| **111** | **Education, level unspecified** |
| 11110 | Education policy and administrative management |
| 11120 | Education facilities and training |
| 11130 | Teacher training |
| 11182 | Educational research |
| **112** | **Basic education** |
| 11220 | Primary education |
| 11230 | Basic life skills for youth and adults |
| 11240 | Early childhood education |
| **113** | **Secondary education** |
| 11320 | Secondary education |
| 11330 | Vocational training |
| **114** | **Post-secondary education** |
| 11420 | Higher education |
| 11430 | Advanced technical and managerial training |

*Source:* OECD Statistics (stats.oecd.org)

**Table 5-C-3:** Subcategories of aid to institutions

| Code | Purpose Category |
|---|---|
| | **INSTITUTIONS** |
| **15113** | Anti-corruption organizations and institutions |
| **15130** | Legal and judicial development |
| **25010** | Business support services and institutions |

*Source:* OECD Statistics (stats.oecd.org)

**Table 5-C-4:** Sample countries by income group

| **Low-income economies ($1 045 or less)** | **Lower-middle-income economies ($1 046 to $4125)** | **Upper-middle-income economies ($4 126 to $12 745)** | **High-income economies ($12 746 or more)** |
|---|---|---|---|
| Bangladesh (1) | Bolivia (2) | Algeria (4) | Chile (10) |
| Malawi (2) | Egypt (3) | Angola (4) | Croatia (9) |
| Uganda (6) | El Salvador (1) | Argentina (5) | Slovenia (1) |
| | Ghana (3) | Bosnia & Herzegovina (6) | Trinidad & Tobago (2) |
| | Guatemala (4) | Botswana (2) | Uruguay (8) |
| | India (4) | Brazil (11) | |
| | Indonesia (2) | China (9) | |
| | Morocco (1) | Colombia (8) | |
| | Nigeria (2) | Costa Rica (2) | |
| | Pakistan (3) | Dominican Republic (3) | |
| | Philippines (2) | Ecuador (6) | |
| | Vanuatu (1) | Iran (6) | |
| | Vietnam (1) | Jamaica (1) | |
| | Yemen (1) | Jordan (2) | |
| | Zambia (3) | Kazakhstan (1) | |
| | | Lebanon (1) | |
| | | Libya (1) | |
| | | Macedonia (4) | |
| | | Malaysia (6) | |
| | | Mexico (7) | |
| | | Montenegro (1) | |
| | | Namibia (2) | |
| | | Panama (4) | |
| | | Peru (9) | |
| | | South Africa (10) | |
| | | Suriname (1) | |
| | | Thailand (6) | |
| | | Tunisia (3) | |
| | | Turkey (7) | |
| | | Venezuela (5) | |
| 9 observations | 33 observations | 137 observations | 30 observations |

*Notes:* Numbers in brackets refer to the number of available observations per country.

**Table 5-C-5:** Sample countries by region

| **Latin America and the Caribbean** | **Europe and Central Asia** | **East Asia and Pacific** | **South Asia** | **Middle East and North Africa** | **Sub-Saharan Africa** |
|---|---|---|---|---|---|
| Argentina (5) | Bosnia & Herzegovina (6) | China (9) | Bangladesh (1) | Algeria (4) | Angola (4) |
| Bolivia (2) | Croatia (9) | Indonesia (2) | India (4) | Egypt (3) | Botswana (2) |
| Brazil (11) | Kazakhstan (1) | Malaysia (6) | Pakistan (3) | Iran (6) | Ghana (3) |
| Chile (10) | Macedonia (4) | Philippines (2) | | Jordan (2) | Malawi (2) |
| Colombia (8) | Montenegro (1) | Thailand (6) | | Lebanon (1) | Namibia (2) |
| Costa Rica (2) | Slovenia (1) | Vanuatu (1) | | Libya (1) | Nigeria (2) |
| Dominican Republic (3) | Turkey (7) | Vietnam (1) | | Morocco (1) | South Africa (10) |
| Ecuador (6) | | | | Tunisia (3) | Uganda (6) |
| El Salvador (1) | | | | Yemen (1) | Zambia (3) |
| Guatemala( 4) | | | | | |
| Jamaica (1) | | | | | |
| Mexico (7) | | | | | |
| Panama (4) | | | | | |
| Peru (9) | | | | | |
| Suriname (1) | | | | | |
| Trinidad & Tobago (2) | | | | | |
| Uruguay (8) | | | | | |
| Venezuela (5) | | | | | |
| 89 observations | 29 observations | 27 observations | 8 observations | 22 observations | 34 observations |

*Notes:* Numbers in brackets refer to the number of available observations per country.

# Chapter 6 : Conclusions

This dissertation studies the role of FDI and foreign aid in domestic entrepreneurship in host countries, where both types of inflows can be seen as additions to the available tangible (e.g., capital equipment) and intangible (e.g., managerial know-how) resources. The related questions of who becomes an entrepreneur, why does entrepreneurship take place and what are the drivers of new firm formation, etc., receive growing attention from both policy circles and the academic world due to the wider economic impact of entrepreneurship on society. From the perspective of the allocation of scarce resources, in the simplest sense, entrepreneurship is a choice comparable to everyday economic decisions such as which cell phone to purchase or whether to go to a movie. People have finite resources but unlimited needs and wants. Accordingly, individuals need to exercise choice in how to use their constrained resources in order achieve the best or the optimal results. They compare the costs and expected benefits of their choices, and proceed if the latter outweigh the former. In this regard, the decision on becoming an entrepreneur is no different from any other economic decision that we all have to make.

Yet, engaging in entrepreneurial activities has distinctive characteristics. To begin with, it entails a high degree of risk, a substantial time investment, involves careful planning and preparation, and requires balancing the interests of various stakeholders with whom the entrepreneur interacts: investors, employees and customers. Furthermore, the decision of establishing a new firm is made less frequently compared to other economic choices that individuals face in daily life. Despite being a less widespread decision, owning a new venture and subsequent investment commitments have far-reaching economic consequences at local, regional and global scales which contribute to the livelihoods of people often unknown to the entrepreneur. The economy-wide benefits of the entrepreneurial decision occur whilst entrepreneurs are primarily interested in potential gains from new business activity contributing to their own well-being and for their immediate family at best.

As higher entrepreneurship tends to bring desirable economic outcomes for the society as a whole, the understanding of its determinants has been a major concern of policymakers, and the issue has drawn increasing attention from academics. The list of factors affecting entrepreneurship is vast, ranging from elements at the individual level, such as personality traits and education to external conditions including the institutional context, macroeconomic conditions, and factors at the industry level. It is hard to specify ex ante which of these factors prove to be most important, but it conceivably depends upon the focus of the analysis. A hybrid form of the underlying causes of entrepreneurship often occurs in that they interact, and may act as substitutes and complements for one another. Furthermore, the interplay between various factors may be different at different time periods and context while their importance may also evolve over time. For instance, prevailing macroeconomic conditions may not be very favourable for entrepreneurship. Yet, an innovative business idea targeting a new or underserved market may get underway through the persistent character of the entrepreneur where he/she may get the first customers through his/her personal network. As aggregate economic conditions improve, the new business may flourish and expand during upturns in the market.

As countries increasingly integrate into the world economy, they need to adjust their competitive positions accordingly. Given the influence of globalization, national economies should take into account the responsiveness of their local circumstances including domestic entrepreneurship to the changing world scene. In particular, capital flows in the form of FDI and foreign aid, which are important manifestations of global

integration, bear strong implications for new business activities in host countries. Surprisingly, existing studies on the determinants of entrepreneurship largely overlook this aspect. Therefore, a comprehensive work considering this subject in a systematic way was required.

Foreign aid bridges advanced economies to their developing counterparts where the former group is guided by altruistic motives in the allocation of aid flows. In contrast, FDI finds its way across countries based on economic incentives. Foreign investors choose to locate in countries offering the highest return on investment. What is common for both FDI and aid is that capital, skills, technological and organizational know-how move across national boundaries. These are valuable resources that can be utilized in entrepreneurial activities, both during the establishment and subsequent expansion period, in host countries. The plausible inference to draw is that FDI and aid inflows into a country alter the balance of resources available to domestic entrepreneurs. Such a change in the level of resources in the host countries may arise, for instance, due to both the introduction of innovation and new market opportunities by foreign firms and the diversion of domestic endowments (e.g., labour, finance) away from would-be entrepreneurs at the same time. Likewise, aid flows are often spent in entrepreneurship-enhancing practices such as physical infrastructure which expand the resource base in receiving countries. In turn, the surplus and shortage of various resources ensuing FDI and aid inflows tend to alter the motives of prospective entrepreneurs in relation to owning a business. In this respect, in the introductory chapter, we draw on the analogy between the effects of FDI and aid on domestic entrepreneurship on the one hand, and the effects of external conditions (e.g., the institutional context) on the other. While the latter aspect has been extensively researched, surprisingly, empirical evidence focusing on the former dimension is rather limited. This dissertation is therefore intended to advance research in this direction.

While the next section summarizes the main findings of each chapter, section 6.2 discusses the policy implications of our results, with the limitations and future research opportunities are provided in the last section.

## 6.1. Empirical Results

The introductory chapter offers a general background for the work presented in this thesis, and already reflects on possible research paths, setting the scene for the chapters to follow. In the empirical analyses, we investigate the association between FDI and foreign aid, and domestic entrepreneurship in host countries from various aspects. While the focus of Chapters 2, 3 and 4 are on FDI effects, Chapter 5 examines the role of foreign aid in new business activities in aid-recipient countries.

In Chapter 2, we utilize cross-country variation over time in FDI in the form of M&A and domestic entrepreneurship to pin down the aggregate effects of the former. This cross-country study is essential to the understanding of Chapters 3 and 4, which are individual country studies, as we bring out general tendencies with respect to the responsiveness of entrepreneurship rates to FDI. Our aim here is to identify broad regularities in the data and draw a general picture of the FDI-entrepreneurship link. Furthermore, industries are heterogeneous in many of their characteristics including innovation patterns, technological levels, while varying widely in their reliance on and ability to attract FDI. In turn, these discrepancies are likely to affect the way entrepreneurship rates react to FDI presence in the respective industries. To account for this essential feature, we consider two levels of industrial breakdown. While the aggregate analysis conveys useful insights into the way the sum of horizontal and vertical FDI effects

across the economy as a whole affects entrepreneurship, the industry level estimates focus on horizontal effects of FDI.

The results provide evidence that adverse effects from FDI counterbalance potential positive effects, leaving the net impact on domestic entrepreneurship negative though it is economically very small. This relationship holds true both at the aggregate and industry level analysis. Heightened competition in product and factor markets ensuing FDI is viewed as the main cause of crowding-out of domestic firms in local markets (e.g., Aitken and Harrison, 1999). Unable to catch up with their peers in technological terms, domestic firms may eventually withdraw from the market. In contrast, difficulties in the propagation of foreign knowledge may arise due to the fact that foreign firms actively protect their intellectual property and ensure profit realization, at the expense of less advantageous domestic firms. In addition, by pulling scarce domestic resources out of the reach of would-be entrepreneurs, foreign firms may increase the opportunity cost of owning a new business. Hence, entrepreneurially-talented individuals may be employed in foreign firms due to higher wages and potential volatility in entrepreneurial income. In this chapter, even though we do not directly test the competition effects, the results of the industry level analysis can be taken as suggestive evidence. The majority of FDI inflows in the data are heavily concentrated on the transformative (mainly manufacturing) and service industries, rather than the extractive ones (e.g., mining). The negative association between FDI and the rates of domestic entrepreneurship is more pronounced in the former groups. In contrast, the magnitude of this effect is markedly weakened and became insignificant in the extractive sectors where the coexistence of foreign and domestic firms is limited, as are the observed levels of competition. Finally, nascent entrepreneurship, the incipient intention to become an entrepreneur, is found to be the most vulnerable type of new business activity. The younger the start-up, the stronger are the negative effects of FDI. This finding suggests that entrepreneurs with the least market experience and firm tenure are affected the most by FDI, with the size of the negative effect amplifying as the new domestic firms advance in age.

While a negative association between FDI and entrepreneurship is established in Chapter 2, we cannot be sure what mechanisms drive this relationship. Having the findings of the previous chapter in mind, in Chapter 3, we consider the underlying dynamics of such an outcome. Namely, we propose that both industry competition (thus concentration) and wage levels act as two possible channels of transmission of FDI effects on domestic entrepreneurship measured via gross firm entry. The credibility of each assertion is tested by using data from Dutch manufacturing industries. We found evidence to suggest that higher levels of FDI coincide with increased wage and concentration levels. The implications of these FDI-induced effects for domestic entrepreneurship are twofold: i) increased wages translate into reductions in gross entry rates, and ii) higher market concentration is positively related to entrepreneurial activity.

The former finding indicates that higher industry wages attract prospective entrepreneurs into wage-employment rather than pursuing a career as a new venture owner. One possible explanation for the positive relationship between industry concentration and gross firm entry is that concentrated markets enjoy higher rents which, in turn, may attract new entrants. Put differently, in Dutch manufacturing sectors, FDI does not seem to be able to build up market barriers against domestic entry. Furthermore, these findings maintain coherence when the entry of single-owner firms is excluded from the analysis. This suggests that even though this type of new firm entry accounts for the majority of entrepreneurial activities in the Netherlands, their role in the observed results is indistinguishable. This might be the case because sole entrepreneurs often serve niche markets where foreign firms avoid entering due to the small market size and limited

growth potential. This in turn restricts the encounter of solo entrepreneurs and foreign firms, as is the direct competition between them. Another result revealed in Chapter 3 is that once the indirect effects of FDI are separated out, no direct relationship between foreign firm presence and gross entry exists in the sample. This indicates that both industry concentration and wage mechanisms play crucial roles in transmitting FDI effects on domestic entry. Finally, the breakdown of data into industries based on their technological intensity demonstrates that the main results of the analysis are driven by FDI effects in low-tech, but not high-tech industries.

A strand of theoretical literature draws attention to the embeddedness of foreign firms in local markets through linkages established with domestic firms. Most notably, Markusen and Venables (1999) demonstrate that subsequent to foreign entry there will be an increase in demand for locally-produced inputs which may stimulate domestic entry into the supply industries via backward linkages. The size of this desired effect hinges on the input buying tendencies of foreign firms operating in host countries. As part of international supply chains, if intermediate goods are procured from the home country or some other third countries, then the use of local inputs would be limited, and this would lead to less scope for benefits through backward linkages. Markusen and Venables (1999) also suggest that foreign firms may introduce new goods and services into the market, or alternatively produce currently available ones at less cost for domestic firms which use them as inputs. In turn, this may foster domestic entry into the final goods industries through forward linkages. Given these theoretical predictions, an empirical understanding of the interplay between vertical linkages and domestic entry is essential. Motivated by the lack of empirical work in the field, in Chapter 4, we study the effects of FDI on local firm entry from the perspective of vertical linkages in a developing country context, specifically Turkey. Focusing the analysis on a developing economy merits particular attention as inter-industry linkages with foreign firms are often argued to serve as catalysts for industrial development. The current study design considers both backward and forward linkages. Furthermore, as the quantification of overall FDI effects requires the inclusion of horizontal linkages into the analysis, we also explore this dimension. Finally, the investigation focuses on both manufacturing and service industries.

We found that while domestic entrepreneurship measured through net entry rates is unresponsive to horizontal and backward linkages, industries with large forward linkages with foreign firms accommodate more entrepreneurship. Previous studies (e.g., Saygılı et al., 2010) suggest that Turkish industries rely heavily on the use of imported intermediate inputs in their production process, an observation that is valid for both foreign and domestic firms. The preference of foreign firms for global sourcing rather than using local inputs in turn, renders weak backward linkages with Turkish suppliers. This might explain the absence of the association between FDI and net entry rates through backward linkages. Possible reasons for the widespread use of imported inputs include the absence of domestic production, limited technological capabilities of local suppliers, high sophistication of required inputs, difficulties in timely delivery and the level of autonomy of foreign firms granted by their parent companies. Furthermore, the appreciation of the Turkish lira against other major currencies in the last decade reduced the cost of importing, making it a more attractive alternative compared to domestic inputs. Finally, the customs union agreement between Turkey and the EU allows foreign firms to import high quality inputs on privileged terms without having to pay a tariff, increasing the tendency to import.

Most FDI inflows into Turkey are the market-seeking type. Foreign firms with this motive are expected to accelerate competition more fiercely as they directly compete with domestic peers serving the local market, and thereby leading to the crowding-out of domestic entrepreneurship as predicted by Markusen and Venables (1999). However, such

a relationship is not observed in the Turkish context. Previous research suggests that Turkish enterprises operating in the final goods and service industries have gradually increased their competitive capabilities in the last decade mainly due to the extensive use of imported inputs. The replacement of local inputs with imports has contributed to productivity growth in domestic firms through learning, variety and quality effects. Our educated guess is that increases in the competitiveness of Turkish firms may account for the absence of the adverse effect of FDI on entrepreneurship which is expected to be conveyed via horizontal linkages.

Based on the collection of results discussed until now, one may reasonably ask what the proper conclusion is to be drawn from Chapters 2 through 4. Does FDI contribute to or impair domestic entrepreneurship? Alternatively, an insignificant relationship is also evident. Our results are heterogeneous; all three kinds of findings are discerned from the analysis. Although this may appear as a concern to some, we hold the opposite view especially with regard to FDI effects transmitted via the channel mechanisms in Chapters 3 and 4. The expectation of uniform influences on domestic entrepreneurship via diverse channels seems questionable given the differences in the underlying forces of each channel effect. Furthermore, the direct impact of FDI in the respective chapters also varies, suggesting a move away from one-size-fits-all results. Chapters 2 through 4 differ in a number of dimensions such as the level of industry disaggregation, time span, the country context, entrepreneurship measures, types of FDI inflows, each of which may be responsible for the divergent results. Review studies focusing on a particular literature oftentimes characterize the current state of the available findings as *inconclusive*, *mixed* indicating a lack of consensus on the conclusions derived from the individual papers. Surveys of the literature on FDI in various aspects are not any different (see, Görg and Greenaway, 2004). Hence, the diversity of our results with respect to the FDI-entrepreneurship link simply echoes what has been the dominant trend in the literature.

Chapter 5 focuses on foreign aid as a potential determinant of new business activities in aid-recipient countries. Within the last two decades, sizable aid flows were channelled into areas considered important for unleashing the entrepreneurial potential of the poor. While FDI and aid are viewed as complementary among donor countries and institutions, and aid has been extensively used to finance development projects related to the entrepreneurship-enhancing practises, this direction of research has received little attention. Specifically, in Chapter 5, we argued that purpose-specific foreign aid targeted at education, physical infrastructure and institutional reforms are of central concern to entrepreneurship development in aid-recipient countries. Latent entrepreneurs with higher educational levels tend to be better at spotting new market opportunities. Similarly, business-related training and education can help would-be entrepreneurs overcome knowledge shortages about market conditions as well as how to start and sustain a new enterprise. Improved physical infrastructure such as transportation networks, communication facilities and energy supply systems cuts the cost of production, increases the productivity of investment, and hence, may nurture entrepreneurship. Well-working institutions, e.g., a stable legal environment, reduce uncertainty surrounding new business undertakings, such that long-term investment plans become feasible. However, the fungibility of aid flows among target categories often appears as a concern when purpose-specific aid is considered. More specifically, fungibility refers to the switching of aid flows to alternative uses from the ex-ante specified ones. This issue is partially accounted for by relating domestic entrepreneurship rates to aggregate aid flows along with the categorical aid.

Our results suggest that new business activities in aid-recipient countries are an increasing function of aggregate aid flows. However, when the purpose dimension is taken

into account, the strength of this link weakens, and eventually becomes insignificant. Put differently, aid to education, physical infrastructure and institutional reforms fail to achieve their desired ends. Taken together, aid is found to foster entrepreneurial endeavours but only at the aggregate level. This is suggestive of the idea that there might be other aid groupings driving the observed aggregate effect. To shed light on this issue, we incorporated all 36 purpose-specific aid categories in the analysis. The simultaneous consideration of all aid classes emphasizes the importance of supporting the basic needs and capabilities (e.g., food supply, basic health and basic education) as well as providing a minimum level of human security—both in times of disaster and political instability in fostering domestic entrepreneurship

## 6.2. Policy Implications

The results of the cross-country study in Chapter 2 suggest that the adverse effects of FDI on domestic entrepreneurship exceed the positive ones. Although the net impact is negative, its economic significance remains quantitatively small. Furthermore, nascent entrepreneurship is found to be the most susceptible to FDI. The key implication of these findings is that FDI poses both opportunities and challenges to domestic firm development, and thus policy makers in host countries should not take the existence and availability of the benefits of FDI for granted in the local economy. From the perspective of economic significance, a policy intervention may not be necessary given the negligible magnitude of the negative effect. However, we argue that host country FDI policies should be harmonized with the acts that offset any disadvantages placed on domestic entrepreneurship, and thereby reverse the negative tendencies to establish a more favourable relationship.

Any feasible policy initiative by host countries can consider actions at two different spheres: at the international and national levels. First, equipped with the superior knowledge about the local markets and business conditions, host governments may try to attract the right type of FDI which provides the optimal benefits package for entrepreneurship development whilst limiting the potential for harm. For instance, there may be a technology fit between FDI and the host country where new technology is sufficiently advanced to add to the pool of available business opportunities. Simultaneously, the matching of the capabilities ensures that the technology gap is not too wide, such that the FDI-induced competition becomes less of a threat. However, a strategy focusing disproportionately on domestic concerns may urge policy makers to impose various conditions (e.g., local content requirements and mandatory technology transfers) on foreign investors to ensure that FDI positively contributes to domestic entrepreneurship. Such efforts may easily backfire as foreign investors tend to avoid countries with lots of restrictions. In the international arena, foreign firms have greater freedom in locational choice given the number of countries available for investment. This usually leaves host economies with a weak bargaining position against foreign investors. Therefore, policy makers of the individual states have more room to make alterations in existing practises at the national level regarding the FDI-entrepreneurship link.

First, once foreign firms are present in a country, policy may consider stimulating voluntary technology transfer through economic incentives rather than mandatory means. Likewise, foreign firms may be encouraged to participate in collaborative innovation projects with local universities and research centres which enhance the local knowledge base, and pave the way for new business opportunities. Such a policy intervention would be more effective if complemented with an expansion in the supply side capacity of prospective entrepreneurs through investment in both industry-specific education and

training focusing on technical and managerial skills. Equipped with the right mix of knowledge, skills and competences, individuals with an entrepreneurial spirit would more readily recognise new venture opportunities. Besides, with more resources being devoted to the development of the absorptive capacity of the local economy, private sector would be more competitive against foreign firms, reducing the degree of crowding-out of domestic entrepreneurship.

Chapter 3 shows that FDI in Dutch manufacturing sectors is positively associated with both industry concentration and wages, which in turn translate into increases and decreases in domestic entry rates, respectively. This suggests that the effects of FDI on entrepreneurship transmitted through these two channels work in opposite directions. Furthermore, once its indirect effects are isolated, Dutch firm entry is found to be unresponsive to FDI indicating concentration and wage channels are decisive in the diffusion of FDI effects, and thus should be the basis of policy formulation.

First, although high market concentration is a legitimate concern due to the potential abuse of market power against new entrants, such a conclusion is not justified in Dutch manufacturing sectors. The lucrative rents in markets seem to be accessible to both foreign and domestic firms, conceivably due to the effective enforcement of the current policy arrangements on collusive and retaliatory conducts of incumbent firms. Although there is no immediate threat of increased concentration, policy makers can perform in-depth industry analyses to identify the specific causes of this market distortion. For instance, heightened concentration in the industry may be the result of large scale foreign entry. Alternatively, heavy R&D investment by foreign firms may give rise to the accumulation of market shares amongst a small number of enterprises. Besides, market conditions in certain industries may change more rapidly or slowly depending, for example, on the rate of the obsolescence of technology. A rapid renewal of technology, in turn, echoes in short product cycles where foreign firms can be more adept at reversing the market concentration in their favour. As a result, due to the various causes of market concentration surrounding FDI, any policy response correcting anti-competitive behaviour should place greater emphasis on specific industry settings, and should be formulated accordingly.

Second, policy makers may develop strategies to curb the negative effects of FDI on entrepreneurship conveyed through the wage channel. Yet, from a welfare point of view, an effective policy design should not necessarily equate the selection of entrepreneurial talent into wage-employment to being undesirable. Under certain circumstances, the added welfare of employment filled with innovative and creative practices may be comparable to, or even larger than that arising from new firm activity, given the persistent high failure rates of start-ups. For instance, if a motivated entrepreneur takes a position in a technologically strong foreign firm offering good remuneration and promotion prospects, this move may generate welfare-enhancing opportunities through intrapreneurship initiatives. Therefore, on a general level, policy-making may be directed towards increasing the awareness on the importance of intrapreneurship among private sector actors, especially among large businesses that are capable of devoting more resources to innovation. Policy efforts should stress that proactive and innovative behaviours of employees are beneficial to themselves in the first instance. Having access to companies' resources increases their chances of success in developing new products and entering new markets for their employers which in turn help them retain their jobs, bringing financial security. In practice, information exchange sessions may be organized to bring experienced intrapreneurs and employees with entrepreneurial inclinations together. The former group, who has already successfully completed intrapreneurial projects, can share their practical knowledge, personal development and career enhancement stories. In

this way, best practices on intrapreneurial activities may be transferred among employees of different enterprises, expanding their skill sets and stock of tacit knowledge. At the firm level, intrapreneurship supports innovation within established firms, allowing them to grow and recognise new market opportunities. Accordingly, individual firms should create an organizational culture that nurtures intrapreneurial activities through employee recognition, making resources available, encouraging risk taking, proactive behaviour and innovation, giving employees more autonomy, ensuring management level support, and knowledge-sharing and collaboration between the employees of different departments. At the national level, a vibrant private sector with high intrapreneurial tendencies contributes to the overall welfare of the society as well as the nation's competitiveness in the international arena. Hence, an effective government policy supporting entrepreneurial activities within existing businesses may, to some degree, counterbalance the reduced entrepreneurship rates stemming from high wages.

In Chapter 4, we find no evidence of FDI effects on domestic entrepreneurship through backward linkages which is attributed to the heavy use of imported intermediate inputs by foreign firms. The difficulties related to the quality of local inputs, technical capabilities of Turkish suppliers, timely delivery and cost are cited as the main reasons for importing. A possible policy response would be to support and encourage R&D activities in supplier industries to attain technological progress and innovation in products and processes. Investing in continuous R&D initiatives can enable local suppliers to upgrade and refine their technology skills, and such a strategy may help them meet the quality demands of foreign firms.

Although improved in recent years, Turkey maintains a low profile in R&D activities compared to countries of a similar income level, both in terms of resources devoted and the returns to R&D. For instance, R&D expenditures as a percentage of GDP in Turkey increased from 0.48% in 2003 to 0.95% in 2013. However, the figure in 2013 is still lower than that of Brazil (1.21%), Russia (1.12%), and China (2.019%).[123] Likewise, Turkey exhibits poor performance compared to the OECD average (2.4%). A similar picture emerges when we consider patent applications and the number of professionals working in R&D units. The low capacity of the country in the creation of knowledge, products and processes leaves ample room for R&D polices to exert an influence on the technological capabilities in supplier industries. An initial policy move would attempt to change the prevailing view among business owners and would-be entrepreneurs on spending in R&D activities. It should be clearly communicated that investment in R&D is not a redundant cost, but it represents future economic benefits. Second, as R&D researchers are the backbone for enhancing innovative capacity, up-to-date education and training programs may be developed to build up and strengthen their skills and knowledge. More individuals with the appropriate competences may be attracted to research positions, for instance, by improving working and salary conditions. Similarly, firms may be given economic incentives (e.g., tax relief) to employ more R&D professionals. Third, the majority of R&D centres established in the last few years focus exclusively on the automobile and its supplier industries which are already considered as competitive and innovative. Therefore, a plausible policy option would be to stimulate the diversification of the R&D undertakings over a broader range of industries. Next, the success of R&D activities necessitates extensive coordination, cooperation and information exchange between various stakeholders such as public and private sectors, research institutions and

[123] While data for Turkey, China and Russia is extracted from the OECD, R&D expenditures data for Brazil is from the World Bank's WDI and refers to the year 2011.

universities. Therefore, policy makers must ensure that a high level of cohesion between all parties is achieved.

On a general note, for competent supply industries to thrive, policies should also address the challenges related to the wider business environment, for instance, the minimization of corruption and improvements in the enforcement of property rights. Social acceptance of entrepreneurship should be increased so that more talented individuals regard owning a business as a valuable career choice. Finally, active and would-be entrepreneurs may be provided with the advisory services in the areas of priority for foreign firms such as just-in-time delivery to ensure their requirements from local suppliers are well-understood and adequately met.

In Chapter 5, we show that there is an aggregate effect of foreign aid on entrepreneurship which necessitates the identification of the most and least effective aid categories. The results suggest that aid groupings which are expected to be especially impactful (education, physical infrastructure and institutions) are in fact unrelated to new business activities. In contrast, aid flows spent on the provision of basic needs (e.g., food supply, basic education and basic health) and in hard times (e.g., political instability) are beneficial for entrepreneurship development. One immediate policy implication is that the recent shift in the objectives of donor countries and institutions placing greater importance on entrepreneurship is well-received. Our study points out redefining aid effectiveness from economic growth to entrepreneurship. However, the crux is that the drivers of entrepreneurial activities in aid-recipient countries are not the ones prioritized by donors, rather alternative aid categories appear to be more influential. This suggests that donors should re-evaluate their existing initiatives and focus on the areas of that need the utmost attention. The mismatch between what is intended and what actually occurs may be due to a lack of understanding regarding the specific requirements in the lower income countries. Donors often base their aid allocation decisions on the perspective of advanced countries. What works in a developed economy, however, may not work in a developing one. Therefore, donor agencies should pay close attention to the interests and demands of recipients who possess comprehensive knowledge about their local conditions where donors are often considered to have limited capacity.

One related policy implication for the receiving countries is that they should participate more in the decision-making process surrounding aid disbursements. They should be transparent in the information they provide about the needs of the country, and show greater ownership of aid-funded activities supported by a long-term commitment. In turn, such an approach may help align the priorities of donors and aid recipients, and the desired development outcome may be achieved where both parties are satisfied with the aid intervention.

Our results in Chapter 5 show that domestic entrepreneurship is particularly responsive to aid flows targeting basic needs and mitigating the effects of external disturbances such as civil conflict and food shortage. Therefore, the provision of more resources in these aid categories seems to be an appropriate course of action for donors. However, the challenge policy makers in aid agencies may face is that while some of these target areas merit continuing support, others are less suitable for such a scheme. For instance, access to basic health or education is a recurring activity whereas conflicts, food shortages and disasters are less frequent and temporal. Given the positive association between aid flows reducing the impacts of such infrequent shocks and entrepreneurship, there appears one immediate question that the policy maker may consider. Does it make sense to devote more resources to these categories even if no external distortion has occurred? Our study does not intend to address this aspect, yet it emerges as a valid

concern. Next, although we fail to find a positive association between foreign aid directed at activities supporting education, physical infrastructure, institutional reforms, and entrepreneurship, we abstain from suggesting a reduction in the level of aid these categories currently receive. Rather, we argue that donors can revisit the way aid to these categories is organized and delivered, and the relevant processes and procedures should be modified where deemed necessary.

It should be noted that the policy implications derived from Chapter 5 are based on a cross-country analysis which sheds light on the general tendencies in the data and provides the average aid effects on entrepreneurship across countries. We also recognize that individual countries may vary in their responses to aid flows due to national idiosyncrasies which may not be captured by a cross-country comparison.

## 6.3. Limitations and Future Research Opportunities

We acknowledge that our research in this thesis is prone to various data-related challenges which are discussed in the respective chapters. This is a shared concern in applied research which is also present in our study. As more data with better quality become available, our understanding and evaluation of the analysis throughout this thesis will evidently be enhanced. In this section, we consider non-data-driven limitations that provide future research opportunities. More specifically, we emphasize the importance of the heterogeneity of FDI and entrepreneurship along with the moderating factors that influence the relationship between the two.

The literature could develop towards taking into account the diversity of FDI in terms of entry mode, motivation and ownership structure. Regarding the type of entry, foreign firms may enter host markets through the acquisition of a local firm where its staff, technological and organizational capabilities as well as physical assets change hands. In contrast, greenfield investment necessitates the establishment of new production facilities from the ground up, adding to the productive capacity of a country. Entry via acquisition may be attractive as it provides quick entry into new markets and immediate access to local resources. If foreign firms attempt to gain, for example, a first-mover advantage, the M&A route can secure the desired objective. Likewise, lower entry costs may be another advantage of the acquisition. Under greenfield investment, foreign investors face large costs associated with setting up a new plant, finding employees with the appropriate skills, developing distribution networks and the integration to the local conditions such as compliance with government regulations. Yet, FDI via greenfield tends to provide the management team with greater control, discretion and flexibility in resource and skill deployment due to the newness of the plant, whereas acquiring an existing organizational structure may limit the implementation of new management practices.

Both theoretical and empirical literatures suggest that firms having a productivity advantage opt for greenfield entry rather than M&A (see, Nocke and Yeaple, 2007). Higher productivity may offset the disadvantages of operating in an unfamiliar environment without the involvement of a local partner. Parent companies are more prone to transfer foreign technology and know-how to their plants built from scratch rather than to acquired firms due to the limited control on the latter type of affiliate. Taken together, such mechanisms provide more scope for knowledge dissipation into the local economy via greenfield FDI, expanding the pool of business opportunities. Yet, the most productive firms with unique technological competencies are highly protective against the external exploitation of their knowledge which acts as a restricting factor to technology diffusion. Next, domestic competition is another component that may differ by entry mode. Competitive pressures tend to be more pressing for domestic competitors under greenfield

investment relative to M&A because of the increase in the number of firms in the industry. Nonetheless, the contribution to the local competition of an acquired firm varies depending on whether its production capacity is increased or decreased in the restructuring process following the acquisition. Furthermore, the impact of greenfield and M&A on domestic entrepreneurship may vary due to the differences in the level of embeddedness in the local economy. More specifically, FDI through M&A already possesses a network of linkages with local firms that greenfield enterprises have yet to develop. In this case, foreign entry via M&A may offer greater scope for positive effects on entrepreneurship. Finally, labour turnover following the ownership change of acquired firms may play a more prominent role in the dispersion of foreign knowledge relative to greenfield investment.

Regarding the entry motivation, foreign firms can use local production either to meet the domestic demand or to export. In the latter case, the host country serves as a low-cost export platform to the rest of the world. Foreign firms with a domestic market orientation tend to establish more linkages with local companies mainly because of the need for adaptation to preferences of the host country consumers. The growing interaction and collaboration with domestic firms can facilitate this adjustment process. In contrast, exporter firms are chiefly concerned with the high quality demanded by their buyers in overseas markets which encourages the use of better quality imports. As a result, export-oriented FDI is often argued to be clustered in enclaves with little or no contact with their surrounding firms. From this perspective, if FDI serves the domestic market, there is more scope for foreign technology to contribute to the local knowledge base, and hence to entrepreneurial opportunities. Similarly, the demand for local inputs is expected to be greater from FDI of this type which may stimulate entrepreneurship in the supply industries. With regard to competition, it is host market oriented FDI that exerts greater pressure on domestic firms. Finally, the heterogeneity in the ownership structure of foreign firms bears implications for entrepreneurial activities in host countries. A whole or majority ownership is often favoured over minority rights as the former types give more flexibility to exercise direct control over enterprise operations. Such a strategy is particularly important when local conditions are less stable, and the dynamics of the host country are relatively dissimilar to the source country of FDI. Wholly-owned affiliates are more likely to receive state-of-the-art technology from parent firms mainly because the control and protection of firm-specific capabilities are difficult in minority-owned affiliates. Therefore, one would expect that the higher the fraction of firms in an industry under full foreign control, the larger the knowledge base available for entrepreneurship.

The above discussion suggests that the heterogeneity of FDI in terms of entry mode, motivation and ownership structure has important bearings on domestic entrepreneurship. Chapter 2 already addresses the effects of FDI via M&A but without enough consideration given to greenfield investment. Likewise, Chapter 4 focuses on the FDI-entrepreneurship nexus in Turkey where most FDI is known to be domestic market oriented. Nonetheless, our data does not allow us to make a clear distinction between FDI motives. Future research may aim to disentangle how the diversity of FDI in various dimensions relates to domestic entrepreneurship in a more systematic way.

Next, similar to most previous studies, we do not take into account the qualitative aspects of entrepreneurship. The measures of entrepreneurship employed in this dissertation reflect their levels but provide less insight into their contributions to the economy in terms of, for example, value added, job creation or technological innovation. High-growth firms in knowledge-intensive sectors are generally regarded as high quality entrepreneurship contributing to economic development disproportionately relative to the other types of firms. Chapter 3 already links FDI to gross entry rates in high-tech manufacturing sectors in the Netherlands but this element of our research has not been

elaborated. One interesting research direction would be to investigate the impact of FDI on this type of entrepreneurship on a more general and systematic level.

There is a growing body of literature on the moderating factors for FDI effects in host countries. Two widely studied elements are technological and geographical proximity between foreign and domestic firms. Previous work shows that positive spillovers from FDI are larger when local firms have the absorptive capacity to identify, assimilate and apply new technology. Likewise, FDI spillovers tend to decay with distance. Future research efforts may explore the extent to which technological and geographical proximity determine the nature of the association between FDI and domestic entrepreneurial activities. For example, one intriguing research question would be whether prospective entrepreneurs with different educational levels respond differently to FDI presence, and whether their post-entry performance differs from each other.

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# Nederlandstalige Samenvatting

Dit proefschrift onderzoekt de rol van directe buitenlandse investeringen (DBI, Engels: Foreign Direct Investment (FDI)) en buitenlandse steun bij binnenlands ondernemerschap in gastlanden, waarbij beide soorten instromen gezien kunnen worden als toevoegingen op de beschikbare materiële middelen (b.v. kapitaalgoederen) en immateriële middelen (b.v. bestuurlijke expertise). Allereerst betogen we dat het nodig is om te kijken naar het grotere geheel met behulp van geaggregeerde gegevens om een globale indruk te krijgen van het verband tussen DBI-instroom en binnenlands ondernemerschap aangezien DBI-instroom een bron van kansen en bedreigingen vormt voor ondernemerschap. Het is niet a priori duidelijk of de gevolgen van DBI-instroom positief of negatief zijn. Het hoofddoel in Hoofdstuk 2 is daarom het nagaan welke van deze effecten de andere tenietdoen. Hierdoor ontstaat weer een beter begrip van de volgende hoofdstukken. De empirische analyse wordt in twee stappen uitgevoerd: i) het directe verband tussen DBI-instroom en ondernemerschap wordt beoordeeld op een grensoverschrijdende basis: dit betreft een steekproef van zowel ontwikkelde als ontwikkelingslanden. De geaggregeerde analyse behelst het totaal van horizontale en verticale gevolgen van DBI-instroom in alle geledingen van de economie, en ii) we gebruiken deelsteekproeven die per sector worden gestratificeerd om de aandacht te richten op horizontale gevolgen. We maken onderscheid tussen verschillende sectoren (productiesectoren, zakelijke diensten en consumentgerichte sectoren, etc.) om antwoord te geven op de vraag hoe DBI-instroom in de sector de binnenlandse toetreding in dezelfde sector beïnvloedt. De belangrijkste les die we uit de resultaten kunnen leren is dat DBI-instroom lokaal ondernemerschap verdringt zowel op geaggregeerd niveau als op intersectoraal niveau. Hoewel er sprake is van een negatief verband is het economische effect tamelijk gering. Startende ondernemers zijn het meest kwetsbaar voor de aanwezigheid van buitenlandse ondernemingen. Samengevat beogen we de volgende onderzoeksvraag te beantwoorden in hoofdstuk 2:

**Onderzoeksvraag 1:** *Wat is het directe effect van DBI-instroom op binnenlands ondernemerschap in een grensoverschrijdende context en reageren verschillende sectoren verschillend op DBI-instroom?*

Het feit dat de gevolgen van DBI-instroom negatief zijn behoeft verdere uitwerking wat betreft het onderliggende mechanisme daarvan. Hoofdstuk 3 behandelt de wijze waarop we deze taak benaderen. We stellen dat zowel concurrentie in de sector (dus concentratie) als loonniveaus twee mogelijke doorgeefluiken zijn van de gevolgen van DBI-instroom voor binnenlands ondernemerschap. Een grotere marktinvloed van buitenlandse ondernemingen en verdringing na intensieve concurrentie kunnen negatieve gevolgen hebben voor ondernemersactiviteiten. Verder kunnen loonpremies die door buitenlandse ondernemingen worden aangeboden het minder aantrekkelijk maken om nieuwe ondernemingen op te richten aangezien ondernemers er mogelijk zelf voor gaan kiezen om in loondienst te gaan. Ingegeven door deze voorspellingen wordt in de analyse gekeken of de effecten van DBI-instroom op ondernemerschap doorwerken via het directe verband daarvan met respectievelijk i) concurrentie in de sector; en ii) lonen in de sector. De geloofwaardigheid van elke bewering wordt getoetst aan de hand van gegevens van Nederlandse productiesectoren. De heterogeniteit van sectoren ten aanzien van de mate van technologische intensiteit wordt ook meegenomen. De reden hiervoor zit hem in de aanname dat de positie van een sector op de technologische ladder een rol kan spelen bij het bepalen van de grootte van de gevolgen van DBI-instroom. De meest opvallende

uitkomst is dat de gevolgen van DBI-instroom voor de toetreding van Nederlandse ondernemingen hoofdzakelijk doorwerken via loon- en concurrentiekanalen. Wanneer deze indirecte gevolgen eenmaal zijn verklaard en verantwoord, dan blijft het directe effect van DBI-instroom op ondernemerschap achterwege. Of nauwkeuriger gezegd: de onderzoeksvraag die wordt behandeld in Hoofdstuk 3 is als volgt:

**Onderzoeksvraag 2:** *Werken de gevolgen van DBI-instroom voor ondernemerschap door via de indirecte gevolgen voor lonen en concurrentie in Nederlandse productiesectoren, en heeft DBI-instroom ook nog directe gevolgen voor ondernemerschap wanneer de indirecte gevolgen eenmaal buiten beschouwing zijn gelaten?*

Hoofdstuk 4 gaat in op de rol van verticale sectorrelaties tussen buitenlandse en binnenlandse ondernemingen in de ontwikkeling van ondernemerschap, hetgeen tot nu toe onderbelicht is gebleven in de literatuur. Dergelijke onderlinge verbanden worden gerealiseerd via: i) achterwaartse relaties (Engels: 'backwards linkages'), b.v. wanneer lokale ondernemingen intermediaire inputs leveren aan buitenlandse ondernemingen; en ii) voorwaartse relaties (Engels: 'forward linkages'), b.v. wanneer buitenlandse leveranciers inputs leveren die worden gebruikt door binnenlandse bedrijven die eindproducten produceren. We stellen dat een toenemende vraag naar lokale inputs door buitenlandse ondernemingen aanleiding kan geven tot de vorming van binnenlandse ondernemingen. Op soortgelijke wijze kan de beschikbaarheid van nieuwe goederen en diensten die worden geïntroduceerd door buitenlandse leveranciers een stimulans zijn voor binnenlandse toetreding in sectoren die eindproducten produceren, waarbij deze goederen en diensten als inputs worden gebruikt. Deze voorspellingen worden getoetst aan de hand van gegevens van Turkse productie- en dienstensectoren. Voor een volledig beeld richt het onderzoek zich ook op de gevolgen van horizontale koppelingen die worden gemaakt met buitenlandse ondernemingen. De resultaten laten zien dat DBI-instroom geen effect heeft op de toetreding van Turkse ondernemingen via achterwaartse en horizontale relaties. We ontdekten echter dat er een positief en significant verband bestaat tussen DBI-instroom en ondernemerschap dat doorwerkt via voorwaartse relaties. De insignificante effecten van DBI-instroom via achterwaartse relaties doen vermoeden dat leverancier-afnemerrelaties tussen Turkse en buitenlandse ondernemingen mogelijk niet sterk genoeg zijn om gunstige omstandigheden te creëren voor de toetreding van ondernemingen. Evenzo kan het achterwege blijven van verwachte negatieve effecten via horizontale relaties op binnenlandse toetreding worden verklaard door een sterkere concurrentiepositie van Turkse ondernemingen die is gerealiseerd in het afgelopen decennium. Samengevat probeert Hoofdstuk 4 de volgende vraag te beantwoorden:

**Onderzoeksvraag 3:** *Spelen achterwaartse, voorwaartse en horizontale relaties tussen buitenlandse en binnenlandse ondernemingen een rol in de ontwikkeling van ondernemerschap in Turkije?*

Terwijl Hoofdstukken 2 en 4 zich richten op het verband tussen FDI-instroom en ondernemerschap, onderzoeken we in Hoofdstuk 5 de effecten van buitenlandse hulpstromen op dezelfde uitkomstvariabele, namelijk ondernemerschap. Buitenlandse steun wordt geacht zowel complementair als supplementair te zijn aan DBI-instroom in landen waarin buitenlandse investeerders weinig belang tonen vanwege de vermeende risicovolle economische omgeving. Hulpstromen worden gebruikt voor de financiering van vele ontwikkelingsprojecten, en toch heeft deze onderzoeksrichting zich in weinig belangstelling mogen verheugen. Ingegeven door deze leemte wordt onze empirische analyse uitgevoerd in twee stappen. Vanwege de 'fungibiliteitskwestie' die speelt wanneer

ontvangende landen steun gebruiken voor andere doeleinden dan waarvoor zij aanvankelijk was bedoeld, analyseren we in de eerste stap de effecten van geaggregeerde hulpstromen op ondernemerschap. Vervolgens differentiëren we steun naar uitkeringsdoeleinden om zo drie hoofddomeinen te behandelen die worden geacht het belangrijkst te zijn voor de ontwikkeling van ondernemerschap. We behandelen hier namelijk hulpstromen die gericht zijn op verbetering van de capaciteiten van hulpontvangende landen ten aanzien van onderwijs, infrastructuur en institutioneel bestel. Hier komen twee belangrijke uitkomsten naar voren: i) we laten zien dat er een sterk positief verband bestaat tussen geaggregeerde hulpstromen en ondernemerschap, en ii) wanneer het doel van de steun in ogenschouw wordt genomen, dan wordt dit verband al zwakker en uiteindelijk insignificant. Over het geheel genomen stimuleert steun ondernemerschap maar enkel op geaggregeerd niveau. Dit pleit voor het idee dat de fungibiliteit van steun mogelijk een rol speelt in het boeken van resultaten. Meer specifiek wordt de volgende onderzoeksvraag onderzocht in dit hoofdstuk:

**Onderzoeksvraag 4:** *Speelt buitenlandse steun een rol in de ontwikkeling van ondernemerschap in hulpontvangende landen, en is er een verschil tussen de effecten van steun die wordt uitgekeerd voor andere doeleinden en de effecten van geaggregeerde hulpstromen op ondernemerschap?*

Dit proefschrift bestaat uit 6 hoofdstukken. Hoofdstuk 1 voorziet in een algemene inleiding op het onderwerp. Onderzoeksvragen, bijdragen en de manier waarop die zich tot elkaar verhouden worden hier ook toegelicht. Het corpus van het proefschrift strekt zich uit van Hoofdstuk 2 tot 5 waarbij de eerste drie hoofdstukken zijn gewijd aan een analyse van de gevolgen van DBI-instroom voor binnenlands ondernemerschap vanuit verschillende perspectieven. In Hoofdstuk 5 behandelen we de mogelijke effecten van buitenlandse steun op ondernemersactiviteiten in hulpontvangende landen. Alle hoofdstukken vormen zelfstandige essays waardoor elke verhandeling onafhankelijk van de andere kan worden gelezen. Daarom wordt sommige informatie herhaald.

## Curriculum Vitae

Seçil Hülya Danakol (1983) was born in Karabük, Turkey. She holds a Bachelor degree in Business Administration from Ege University in İzmir. During her studies in Turkey, she visited the University of Groningen for one year, where she also got her Research Master degree in International Economics in 2009. In the same year, she became a PhD candidate within the chair of Institutional Economics at Utrecht University School of Economics. As part of her research, Seçil was a visiting PhD candidate at the London School of Economics where she also carried out one-year of post-doctoral work on equity crowdfunding. Her research interests include foreign aid, foreign direct investment, alternative means of finance such as peer-to-peer lending and crowdfunding as well as entrepreneurship with a special attention to high-growth and social entrepreneurship categories. During her PhD, Seçil is involved in teaching, did some referee work and presented her work at various international conferences.

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