Small Bus Econ (2017) 48:599–612
DOI 10.1007/s11187-016-9792-z

# Foreign direct investment via M&A and domestic entrepreneurship: blessing or curse?

**Seçil Hülya Danakol · Saul Estrin · Paul Reynolds · Utz Weitzel**

Accepted: 23 July 2016 / Published online: 30 August 2016


**Abstract** There are conflicting predictions in the literature about the relationship between FDI and entrepreneurship. This paper explores how foreign direct investment (FDI) inflows, measured by lagged cross-border mergers and acquisitions (M&A), affect entrepreneurial entry in the host economy. We have constructed a micro-panel of more than two thousand individuals in each of seventy countries, 2000–2009, linked to FDI by matching sectors. We find the relationship between FDI inflows and domestic entrepreneurship to be negative across all economies. This negative effect is much more pronounced in developed than developing economies and is also identified within industries, notably in manufacturing. Policies to encourage FDI via M&A need to consider how to counteract the prevailing adverse effect on domestic entrepreneurship.

**Keywords** Foreign direct investment · Entrepreneurship · New firm entry · Spillovers

**JEL Classifications** F23 · M13 · L26

## 1 Introduction

The flow of capital, technology, knowledge and skills across national boundaries through foreign direct investment (FDI) can have substantial positive external (spillover) effects on the economic development of host economies (Caves 1996; Markusen and Venables

**Electronic supplementary material** The online version of this article (doi:10.1007/s11187-016-9792-z) contains supplementary material, which is available to authorized users.

S. H. Danakol (✉) · U. Weitzel
Utrecht School of Economics, Utrecht University, Kriekenpitplein 21-22, 3584 EC Utrecht, The Netherlands
e-mail: secilhulya@gmail.com

U. Weitzel
e-mail: u.weitzel@uu.nl; u.weitzel@fm.ru.nl

S. Estrin
Department of Management, London School of Economics, Houghton Street, London WC2A 2AE, UK
e-mail: s.estrin@lse.ac.uk

P. Reynolds
Economics and Strategy Group, Aston University, Aston Triangle, Birmingham B4 7ET, UK
e-mail: pauldavidsonreynolds@gmail.com

U. Weitzel
Institute for Management Research, Radboud University, Thomas van Aquinostraat 5, 6525 GD Nijmegen, The Netherlands

1999; Javorcik 2004).[1] Similarly, entrepreneurship is often seen as a key driver of economic growth and job creation in both developing and developed economies (Schumpeter 1934; Markusen and Venables 1999; Acs and Audretsch 2003; Baumol and Strom 2007; Koellinger and Thurik 2012). Indeed, domestic entrepreneurship is an important transmission channel for FDI diffusing the technology, human capital and managerial skills into the host economy (Acs et al. 2008).

FDI, however, also has the potential to generate negative effects on economic development.[2] Foreign entrants may exploit the superior position in the global marketplace, on which their internationalization is based (Caves 1974), to crowd out domestic entrepreneurs. Associated product market power will also result in higher entry barriers for domestic entrepreneurs. Moreover, foreign entrants may also absorb a disproportionate share of domestic factor endowments (e.g., finance, managerial and skilled labor), raising the costs of entrepreneurial entry. Hence, domestic entrepreneurship may be not only a mechanism to internalize positive spillover effects from FDI, but can also suffer from and generate negative ones.

The existing literature, mainly single industry or country studies, provides contradictory results about net spillover effects from FDI. For example, De Backer and Sleuwaegen (2003) show that FDI crowds out entrepreneurship in both product and labor markets in the Belgian manufacturing sector, 1990–1995. In contrast, Görg and Strobl (2002) find that FDI presence has a positive effect on domestic entry in the Irish manufacturing sector. Finally, Barrios et al. (2005) find a U-shaped relationship between FDI and domestic entry using plant-level Irish manufacturing data. Thus, there are—theoretically and empirically—two potentially opposing effects of FDI on entrepreneurship; which dominates is an important empirical question, relevant for policy making in both FDI and in entrepreneurship.

In this paper, we provide a cross-country and cross-industry analysis of the effects of a significant element of FDI inflows, via cross-border M&A, on the host economy entrepreneurial entry. To achieve this, we have constructed a unique micro-panel by country and sector about both entrepreneurial entry (occupational choice between employment and entrepreneurship) and M&A FDI across seventy economies, both developed and developing, and over four sectoral groupings. M&A activities cover up to 80 % of FDI inflows (UNCTAD 2007; Stiebale and Reize 2011). We combine country and sector data about entrepreneurs from the Global Entrepreneurship Monitor (GEM) and about M&A FDI from Thomson to create this new unbalanced cross-country panel by industry.[3] Much of the work in this study has been concerned with aligning the industry classifications of the two datasets and identifying appropriate instruments for FDI in the entrepreneurship equations. That is to say, our study utilizes a rich and unique dataset of M&A FDI and entrepreneurship while taking into account the potential endogeneity of the former with respect to the latter.

Our results support the negative externality view of the FDI–entrepreneurship relationship; we find that the FDI inflows via M&A act to crowd out and reduce domestic entrepreneurship at the level of the host economy and within sectors. The effect, however, is modest in scale; at the economy-wide level, a 10 % increase in M&A FDI inflows as a share of GDP is associated with a 0.19 % decline in domestic entrepreneurship. When one splits the sample between developed and developing countries, we find that the crowding-out effect of M&A FDI is more pronounced in the former group. Results at the sectoral level within each country are consistent with a negative spillover effect; entrepreneurship is crowded out by M&A FDI in the business service and transformative (mainly manufacturing) sectors, but there are no significant effects in the extractive (agriculture, fishing, mining and quarrying) and consumer-oriented industries. We do not identify positive spillover effects within any sector.

[1] Positive spillover effects can occur through the local dissemination of innovations (Barrios et al. 2005; Ayyagari and Kosová 2010), demonstration effects (Barry et al. 2003), labor mobility (Fosfuri et al. 2001), enhanced export performance (Greenaway et al. 2004) and economic restructuring (Caves 1974; Kokko et al. 1996).

[2] See Aitken and Harrison (1999), Kathuria (2000) and Barrios et al. (2005). Negative spillovers can derive from, for example, reduced market competition through entry-deterrence (Dixit 1980) or crowding out (Caves 1996).

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

## 2 Foreign direct investment and domestic entrepreneurship

The literature about the spillover effects of FDI on the host economy is voluminous and primarily focused to identifying productivity effects from FDI within industries (horizontal spillovers) or up and down supply chains (vertical spillovers); see, e.g., Aitken et al. (1997); Görg and Strobl (2002); Haskel et al. (2007); Javorcik (2004). In this paper, we instead concentrate on a different, empirically unresolved, but potentially important diffusion channel for spillovers, namely the effect of FDI (via M&A) on domestic entrepreneurship, at both the economy-wide level and industry level.

### 2.1 Positive spillover effects

Positive spillovers from FDI are usually argued to derive from the diffusion of technology and knowledge between foreign entrants and domestic incumbents (e.g., Javorcik 2004). Foreign firms are assumed to be more productive than their local counterparts (Caves 1996), because of firm-specific ownership advantages in resources and capacities (Dunning 1993). The diffusion of ideas and the transfer of technology resulting from interaction with local economy can occur both within and across industries (Javorcik 2004; Haskel et al. 2007).

An important channel for knowledge diffusion is demonstration effects (Kokko 1992; Barry et al. 2003), which occur when, for example, local firms upgrade their technologies or adopt similar organizational practices to those introduced by more productive foreign companies (most likely to be observed within an industry). Furthermore, domestic entrepreneurs may also recognize the market potential of innovations introduced by foreign firms.

Labor mobility is another mechanism through which superior technology, skills and know-how may diffuse from foreign to local firms (Fosfuri et al. 2001). Local workforce previously employed and trained by foreign-owned firms might be equipped with better skills when they take jobs in local enterprises. They may also choose to exploit these skills through entrepreneurship (Knight and Cavusgil 2004).

Furthermore, export-oriented FDI can provide local firms with the knowledge necessary to penetrate overseas markets (Greenaway et al. 2004). Exposure to FDI can positively influence the export decisions of existing domestic firms (Aitken et al. 1997; Kneller and Pisu 2007). It may further stimulate domestic firm creation when export market opportunities are identified by local entrepreneurs.

The positive spillovers through demonstration effects, labor mobility and export-oriented FDI suggest:

**H1a** M&A FDI inflows are positively associated with domestic entrepreneurial entry.

### 2.2 Negative spillover effects

FDI may also generate negative externalities for the host economy (Aitken and Harrison 1999). Because foreign entry is driven by the exploitation of firms' ownership and internalization advantages in profitable new locations, entry of foreign firms may increase competitive pressures on domestic ones driving less efficient ones out of the market (Djankov and Hoekman 2000). Aitken and Harrison (1999) argue that a 'market stealing' effect arises because foreign entry decreases productivity in domestic firms by forcing them to reduce production. Through tougher competition, foreign entrants may come to dominate the host economy industry and exploit their enhanced market power to raise entry barriers for local entrepreneurs. Such negative outcomes may be exacerbated in weaker institutional environments where competition policy is less effective (Aidis et al. 2012).

Another possible channel for negative spillovers is the local labor markets. Foreign firms can exploit their domestic comparative advantage to offer better working conditions and higher wages in the host economy than domestic competitors (Feenstra and Hansen 1997; Lipsey and Sjoholm 2004). In line with occupational choice models in which individuals decide either to be an employee or to be an entrepreneur according to relative income streams (Parker 2004), the higher relative payoff in foreign firms may distort the choices away from entrepreneurship (De Backer and Sleuwaegen 2003).

The negative FDI spillovers, most notably through stronger competition and changes in local wage structures, suggest an alternative hypothesis to H1a:

**H1b** M&A FDI inflows are negatively associated with domestic entrepreneurial entry.

## 3 Data

Our empirical work is based on a unique dataset, consisting of two cross-industry cross-country panels, which cover up to seventy countries across 10 years 1999–2008, for four industries. Based on information at the level of individuals from the Global Entrepreneurship Monitor (GEM), we construct measures of entrepreneurial entry. These are combined with data at the industrial level about cross-border M&A FDI from Thomson to create two panels; one cross-country over time and a second one, cross-sector cross-country over time. Since the Thomson data only consider FDI through M&A, our analysis does not take account of other forms of FDI, most importantly greenfield FDI.

The GEM data have been collected as representative national surveys of individuals since 1999 and now cover more than 70 nations with an increasing emphasis on developing economies (Reynolds et al. 1999, 2003). The Thomson dataset provides information on FDI via M&A into each of the GEM countries for the relevant years and is also disaggregated at NAICS 6 digits level. We match the two datasets at the industrial level and include all countries with sufficient data for our analyses (see online appendix, supplement Tables 4a and 4b, for the sample countries). Supplement Tables 1 and 2 in the online appendix present descriptive statistics for the sample (see below for the definition of variables).

### 3.1 Dependent variables

We employ three GEM measures as dependent variable in our analysis. The definition of each is as follows (Reynolds et al. 2002, 2003):

*Nascent entrepreneurship rate:* The percentage of 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 not yet generated positive cash flows for more than 3 months.

*New business ownership rate:* The percentage of the adult population who presently owns a firm for more than a period of 3 months but less than 42 months.

*Total entrepreneurial activity rate (TEA):* The percentage of adult population who are either classified as nascent or new firm owner-managers.

### 3.2 Independent variables

*Foreign direct investment* (FDI) is measured as annual cross-border M&A inflow at the target or host country level; each individual M&A transaction in our dataset comes with six-digit NAICS codes. M&A data are obtained from the Thomson SDC Platinum database, which supplies authoritative coverage of worldwide M&A activities. We downloaded all deals in which the foreign acquiring firm accumulated at least 10 % target ownership.[4] We use 23, 126 M&A deals to compute FDI inflows per country and year. Following Asiedu (2002), Kemeny (2010) and Aggarwal et al. (2011), we normalize the FDI variable with GDP[5] which is taken from the World Development Indicators (WDI). M&A as well as GDP data is in current US dollars and covers the years through 1999–2008. Thomson provides industrial classifications for its M&A, and these are aligned with those within GEM.

The literature suggests a number of control variables that may influence national entrepreneurial activities (see, Wennekers et al. 2005; Hayton et al. 2002; Acs et al. 2008; Van Stel et al. 2007; Autio et al. 2013). Most important among these are the development level of a national economy (GDP per capita); institutional quality, often indicated in this context by business regulations (Djankov et al. 2002); prevalence of corruption (Aidis et al. 2012; Anokhin and Schulze 2009); and indicators of national culture (Kwon and Arenius 2010). Our control variables are therefore:

*GDP per capita* at purchasing power parity was extracted from the WDI in constant 2005 international dollars. The variable had a bimodal distribution and was highly correlated with other independent variables in the estimated models (see online appendix, supplement Table 2). As the latter could not be resolved via a log transformation or the inclusion of a quadratic term into the estimation model, we loaded a set of five dummies. The reference category dummy takes the value 1 if GDP per capita equals to $11, 500

[4] The 10 % threshold level is the one set by international institutions such as the OECD, IMF and UNCTAD.

[5] We also experimented with gross fixed capital formation and market capitalization of listed companies to normalize FDI, but due to multicollinearity problems, we opted for GDP.

US or less.[6] We chose the cutoff point such that the reference dummy is highly correlated with all other independent variables. This procedure ensures that the reference dummy absorbs much of the multicollinearity so that the remaining dummies are less related to other independent variables (see online appendix, supplement Table 2).

*Business regulation* is defined as total number of days required to register a firm and derives from the World Bank's (WB) Doing Business division.

To control for *corruption,* we use the index from the Worldwide Governance Indicators (Kaufmann et al. 2009); higher values correspond to less corruption. While data are available on an annual basis since 2002, the index is computed only once every 2 years 1996–2002 and the missing values are replaced with the average values of the neighboring years.

Variables capturing cultural characteristics are obtained from the World Values Surveys (WVS). The WVS project has conducted surveys since 1981 and currently covers more than 80 nations.[7] The WVS identifies two dimensions reflecting personal values in a national culture (Inglehart and Welzel 2005; Inglehart 2006) which have been widely used in studies linking values to social and economic outcomes (Inglehart and Baker 2000; Berry et al. 2010). We include (1) *traditional values vs. secular-rational approach*, (2) individual *survival vs. self-expression,* in our empirical analysis. The first involves values such as respect for authority, strong religious practices and family ties, in contrast to open, collective decision making. The second contrasts economic and physical security with the placing of emphasis on personal expression and self-development. Both have been used previously in entrepreneurship research (Hechavarria and Reynolds 2009; Kwon and Arenius 2010; Suddle et al. 2010).

### 3.3 Instrumental variables

FDI inflows and domestic entrepreneurship at the country or industrial level may be explained by other variables omitted from our analysis. Valid instruments must be uncorrelated with the error term of the original regression and good predictors of the variable being instrumented (Greene 2011). We instrument FDI inflows by using the bilateral distance between the source and host economy. The effects of distance on transaction costs of FDI are well established (Javorcik 2004), and this variable is widely used in gravity models (Brainard 1997; Carr et al. 2001; Bevan and Estrin 2004) to predict FDI and trade flows between countries (Lee 1993; Frankel and Romer 1999). There are no theoretical grounds to expect that domestic entrepreneurship levels will be responsive to varying degrees of bilateral distance between investing and host economies. The instrument is defined as the weighted average geographic *distance* (great circle formula; Head 2003) between target country and its M&A source countries at a given year (Mayer and Zignago 2011). The weight for a particular source country is computed based on its M&A share within overall inflows targeting a country-year combination, applied both at the aggregate and industry level.

The sample covers 2000–2009 containing 347 country-year observations. A 1-year lag between dependent and independent variables reduces the sample by 1 year. The panel is unbalanced due to changes in the sample countries included in each wave of the GEM survey.

## 4 Estimation methodology

Our base equation is estimated at two levels; aggregate equations capture the sum of horizontal and vertical spillovers, while the sectoral estimates reflect only horizontal spillovers. We have to account for 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. Moreover, the error term will be correlated with the explanatory variables if unobserved and omitted factors (e.g., legal and institutional elements) affect both entrepreneurship and FDI. For these reasons, we implement a two-stage least squares (2SLS) estimator[8] but also report OLS results to

[6] The cutoff points used to generate the remaining dummy variables are shown in supplement Table 6 in the online appendix.

[7] Nearly 85 %. Information retrieved on April, 18 2012 from http://www.worldvaluessurvey.org/wvs/articles/folder_published/article_base_46.

[8] 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

indicate the bias. We further cluster the standard errors at the country level. All independent variables are also lagged by 1 year to avoid potential simultaneity; a longer lag structure was too expensive in terms of degrees of freedom.

If $i$ denotes countries and $t$ denotes time (years), our main regression equation is:

$$\begin{aligned}\text{Entrepreneurship}_{it} &= \beta_0 + \beta_1 \text{FDI}_{it-1} \\ &+ \sum_{j=1}^{5} \beta_j \text{GDPpc}_{ijt-1} + \beta_3 \text{Contr\_Corrup}_{it-1} \\ &+ \beta_4 \text{Busi\_Reg}_{it-1} + \beta_5 \text{Survival}_{it-1} \\ &+ \beta_6 \text{Traditional}_{it-1} + u \end{aligned} \quad (1)$$

Our first-stage regression is:

$$\begin{aligned}\text{FDI}_{it-1} &= \alpha_0 + \alpha_1 \text{Dista}_{it-1} + \sum_{j=1}^{5} \alpha_j \text{GDPpc}_{ijt-1} \\ &+ \alpha_3 \text{Contr\_Corrup}_{it-1} + \alpha_4 \text{Busi\_Reg}_{it-1} \\ &+ \alpha_5 \text{Survival}_{it-1} + \alpha_6 \text{Traditional}_{it-1} + \varepsilon \end{aligned} \quad (2)$$

Depending on the estimated model, $\text{Entrepreneurship}_{it}$ refers to one of the three GEM measures of entrepreneurial activity discussed in the data section. $\text{FDI}_{it-1}$ denotes foreign direct investment, $\text{GDPpc}_{it-1}$ stands for GDP per capita dummies, $\text{Contr\_Corrup}_{it-1}$ is the control of corruption index, $\text{Busi\_Reg}_{it-1}$ is the total number of days required to register a firm, $\text{Survival}_{it-1}$ and $\text{Traditional}_{it-1}$ refer to the cultural variables and $\text{Dista}_{it-1}$ is bilateral weighted distance. The variables $\text{FDI}_{it-1}$ and $\text{Dista}_{it-1}$ are in logarithmic form because their distribution is non-normal.

Our main regression equation is estimated separately at two levels of aggregation; for the entire sample and within each of four 'industry clusters' as defined by the GEM database: extractive (industries of agriculture, hunting, forestry, fishing, mining and quarrying), transformative (mainly manufacturing sectors), consumer-oriented (retail trade, hotels, education and healthcare), and business services (financial intermediation and real estate). Due to the limited number of entrepreneurship observations per country, it is not feasible to analyze industry effects at a more disaggregated level. However, as the results will show, even the relatively broad clustering of industries already reveals significant differences. Entrepreneurship data used in this work are based on four-digit ISIC rev. 3 industry classification, whereas M&A data are available in six-digit NAICS codes reflecting 2007 updates of the scheme. The supplement 5 in the online appendix shows the composition of each industry cluster and methodological details of the data mapping between ISIC rev. 3 and NAICS 2007 codes.

## 5 Results

### 5.1 Cross-country analysis: overall spillovers

We concentrate on the 2SLS results and show the OLS results for the nascent entrepreneurship rate for illustration. Table 1 reports the most important results using nascent entrepreneurship as the dependent variable (presented in columns (1) and (2)).[9] A significant change, around 10-fold, in the level of OLS and 2SLS coefficients indicates a positive correlation between FDI and the error term in the OLS regression. Furthermore, the standard errors on the FDI variable in the 2SLS model are larger because standard errors in IV differ from OLS only in the $R^2$ of the first-stage regression. We tested the endogeneity of the FDI variable by computing the difference between OLS and 2SLS estimators and obtained a test statistic with a $p$ value smaller than 0.05 for the models reported in columns (2) through (4). Table 1 also includes the partial $R^2$ between FDI and its fitted values in the first-stage regression, which show that the instrument is relevant, and reports the corresponding $F$-score. Finally, Table 1 also shows that the $p$ values corresponding to the under- and weak-identification tests are significant at the 5 % level indicating that the bilateral distance is not weak and fulfills the requirements for a valid instrument.

Footnote 8 continued
endogeneity of FDI (Carkovic and Levine 2005). However, in a (highly) unbalanced panel like ours, GMM drops too many observations.

[9] Estimation results that are not reported are available from the authors upon request.

**Table 1** Aggregate results

| | Nascent OLS (1) | Nascent 2SLS (2) | New business 2SLS (3) | Total early-stage 2SLS (4) |
|---|---|---|---|---|
| FDI/GDP | −0.181 | −1.877*** | −0.801* | −2.571*** |
| | (0.134) | (0.556) | (0.431) | (0.827) |
| GDP pc 2 | −2.512*** | −3.043*** | −3.235*** | −5.907*** |
| | (0.924) | (1.025) | (1.069) | (1.739) |
| GDP pc 3 | −2.551** | −3.346** | −3.694*** | −6.743*** |
| | (1.277) | (1.345) | (1.363) | (2.300) |
| GDP pc 4 | −2.845** | −3.836*** | −3.709*** | −7.164*** |
| | (1.317) | (1.451) | (1.418) | (2.475) |
| GDP pc 5 | −2.197 | −3.484** | −3.342** | −6.532** |
| | (1.371) | (1.596) | (1.417) | (2.604) |
| Control of corruption | −1.093** | 0.0760 | −0.0980 | −0.0199 |
| | (0.493) | (0.679) | (0.552) | (1.094) |
| Business registration | 0.000848 | −0.00548 | −0.00437 | −0.00990 |
| | (0.0171) | (0.0123) | (0.00744) | (0.0123) |
| Survival self-expression | 1.426*** | 1.576*** | 0.829** | 2.252*** |
| | (0.416) | (0.543) | (0.378) | (0.828) |
| Traditional rational | −1.508*** | −1.733*** | −0.768** | −2.384*** |
| | (0.322) | (0.407) | (0.368) | (0.651) |
| Constant | 7.448*** | 7.622*** | 6.788*** | 13.81*** |
| | (0.844) | (0.824) | (0.993) | (1.470) |
| Observations | 347 | 347 | 347 | 347 |
| Countries | 70 | 70 | 70 | 70 |
| Partial $R^2$ (first stage) | | 0.187 | 0.187 | 0.187 |
| $F$-stat (first stage) | | 43.60 | 43.60 | 43.60 |
| Endogeneity | | 0.0002 | 0.0379 | 0.0003 |
| Under-identification | | 0.0000 | 0.0000 | 0.0000 |
| Weak-identification | | 0.0000 | 0.0389 | 0.0001 |
| Centered $R^2$ | 0.473 | 0.225 | 0.308 | 0.323 |
| $F$ | 8.677 | 7.385 | 6.791 | 9.778 |

The dependent variable is the nascent entrepreneurship rate in column (1) and (2), the new business ownership rate in column (3) and the total early-stage entrepreneurship rate in column (4) at the country level. All independent variables are lagged by 1 year. The estimation method is OLS in column (1), and 2SLS in columns (2) through (4). In column (1), the FDI/GDP variable is in its original values (in log). In the last three columns, the predicted values of FDI/GDP (in log) from the first-stage regressions are used where the bilateral distance (in log) serves as an instrument. 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; 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 obtained from the 2SLS estimation in column (2) show that the relationship between lagged FDI via M&A and nascent entrepreneurship is negative and significant at the 1 % level. This finding is consistent across all specifications, except for the OLS estimates which are only reported to indicate the bias in the size of the coefficients. Robustness checks with a two-period lag also do not change our main results qualitatively. Thus, we find support for Hypothesis 1b and not for the alternative Hypothesis 1a. This is in

line with previous findings of De Backer and Sleuwaegen (2003) and in contrast to findings of Görg and Strobl (2002). These studies are both on a single country.

The 2SLS regression findings in column (2) imply that a 10 % increase in FDI affects the nascent entrepreneurship rate in the host economy by −0.19 %. To compute the economic significance of this effect, we assume that the FDI measure increases by one standard deviation (that is 0.81). Holding all other explanatory variables in the 2SLS model in column (2) at their averages, this translates into a reduction of the nascent entrepreneurship rate by 0.015 %.[10] Given a standard deviation of nascent entrepreneurship of 3.97, the magnitude of this decrease suggests that the negative economic effect of FDI via M&A is quite small.

Columns (3) and (4) in Table 1 provide results for alternative entrepreneurship measures as dependent variable. The coefficients on the lagged FDI variable have similar signs but varying magnitudes compared to column (2). Compare with nascent entrepreneurship (column 2) the effect of FDI on new business ownership (column 3) is less negative. Apparently, the negative spillovers of FDI primarily affect very young start-ups. In fact, while a 10 % increase in lagged FDI is associated with a 0.19 % decline in nascent entrepreneurship, the decrease in new business ownership is 0.08 %. The aggregate rate for total early-stage entrepreneurship is 0.26 %.

If we assume that the FDI variable increases by one standard deviation (that is 0.81), this will affect new and total early-stage entrepreneurship activities by −0.01 and −0.02 %, respectively. These numbers are relatively small in comparison with standard deviations of relevant entrepreneurship measures.[11]

As we move through columns (1) through (4) in Table 1, we find consistent results suggesting that higher levels of GDP per capita are negatively associated with domestic entrepreneurship (predominantly significant at the 1 % level), in accordance with the literature (Aidis et al. 2012). Traditional and self-expressive values are associated with greater nascent entrepreneurship activity. Positive values on the traditional vs. secular-rational spectrum indicate more secular-rational orientation; negative values indicate stronger ties with traditions. Similarly, positive values on the survival vs. self-expression range indicate priorities related to personal development, while negative values put more weight on survival. The majority of the coefficients on the cultural variables are statistically significant at the 1 % level.

The reported findings are robust to the inclusion of additional control variables (percentage of total land area in the tropics and a dummy for landlocked countries to capture the geographical influence on entrepreneurial activities), to the substitution of GDP per capita dummies (with continuous GDP per capita variable but also the log form and the quadratic term of GDP along with the linear term), and to curvilinear (quadratic) effects of FDI on entrepreneurship. Supplement 7 in the online appendix explains the robustness checks in detail.

### 5.2 Industry-level analysis: horizontal spillovers

Using the same specification as in Table 1, we now focus on 'industry clusters' (see online appendix, supplement 5) to explore whether horizontal FDI inflow into a given industry has an impact on domestic entrepreneurship in the same industry.[12] The 2SLS model is estimated for each industry. Table 2 reports the results with the host country's annual total early-stage entrepreneurship rate as dependent variable.

We find that the FDI effects in columns (2) and (4) are qualitatively comparable to the full sample with varying significance and magnitude. We find negative and significant relationships between entrepreneurship in transformative and business-oriented industries and FDI into the same sectors. In contrast, domestic entrepreneurship rates in consumer-oriented and extractive industries, although the association is of the same sign, are unresponsive to horizontal FDI flows.[13] Hence, consistent with

[10] This value is calculated by multiplying the FDI variable coefficient with its standard deviation, which is $0.01877 \times 0.808 = 0.015$.

[11] These are 3.18 and 6.12, respectively.

[12] As we do not have data on inter-industry linkages for all countries in the sample, we cannot analyze the effects of non-horizontal FDI inflows on domestic entrepreneurship.

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

**Table 2** Industry-level results

| | Extractive (1) | Transformative (2) | Consumer-oriented (3) | Business Services (4) |
|---|---|---|---|---|
| FDI/GDP | −0.0955 | −0.613** | −0.871 | −0.301* |
| | (0.0627) | (0.269) | (0.534) | (0.160) |
| GDP pc 2 | −0.483** | −1.067** | −3.515*** | −0.0630 |
| | (0.204) | (0.505) | (1.270) | (0.281) |
| GDP pc 3 | −0.792** | −1.344** | −3.896*** | −0.336 |
| | (0.308) | (0.636) | (1.452) | (0.476) |
| GDP pc 4 | −0.858*** | −1.564** | −3.700** | −0.455 |
| | (0.332) | (0.673) | (1.507) | (0.565) |
| GDP pc 5 | −0.821*** | −1.655** | −3.789** | −0.180 |
| | (0.306) | (0.735) | (1.682) | (0.520) |
| Control of corruption | 0.0994 | −0.0908 | −0.619 | 0.158 |
| | (0.117) | (0.293) | (0.554) | (0.186) |
| Business registration | −0.00412** | 0.000629 | −0.00723 | −0.00516** |
| | (0.00194) | (0.00351) | (0.00777) | (0.00262) |
| Survival self-expression | 0.172** | 0.675*** | 0.981** | 0.451*** |
| | (0.0807) | (0.235) | (0.388) | (0.144) |
| Traditional rational | −0.0844 | −0.498*** | −0.653** | −0.247** |
| | (0.0735) | (0.192) | (0.282) | (0.0974) |
| Constant | 0.915*** | 3.485*** | 4.682*** | 1.064*** |
| | (0.193) | (0.516) | (1.445) | (0.236) |
| Observations | 199 | 286 | 234 | 258 |
| Countries | 50 | 59 | 50 | 58 |
| Partial $R^2$ (first stage) | 0.063 | 0.141 | 0.065 | 0.153 |
| $F$-stat (first stage) | 9.74 | 18.57 | 16.21 | 33.77 |
| Endogeneity | 0.1698 | 0.0030 | 0.0572 | 0.0119 |
| Under-identification | 0.0046 | 0.0007 | 0.0029 | 0.0003 |
| Weak-identification | 0.1069 | 0.0012 | 0.0645 | 0.0174 |
| Centered $R^2$ | 0.090 | 0.181 | 0.244 | 0.034 |
| $F$ | 1.746 | 5.597 | 9.504 | 5.059 |

The dependent variable is the total early-stage entrepreneurship rate at the industry level. All independent variables are lagged by 1 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 the bilateral distance (in log) serves as an instrument. 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. 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). 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; 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

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Hypothesis 1b, FDI has negative horizontal spillover effects on domestic entrepreneurship in two out of four industry clusters.

For transformative (business-oriented) industries, Table 2 shows that if lagged FDI into the sector increased by 10 %, the level of total early-stage

**Table 3** Aggregate results: developed and developing country subsamples

| | Nascent OLS (1) | Nascent OLS (2) | Nascent 2SLS (3) | Nascent 2SLS (4) | New Business 2SLS (5) | New Business 2SLS (6) | Total early-stage 2SLS (7) | Total early-stage 2SLS (8) |
|---|---|---|---|---|---|---|---|---|
| | Developed countries | Developing countries | Developed countries | Developing countries | Developed countries | Developing countries | Developed countries | Developing countries |
| FDI/GDP | −0.186 | 0.127 | −1.132*** | −3.000 | −0.692** | 0.252 | −1.790*** | −2.509 |
| | (0.128) | (0.297) | (0.359) | (2.089) | (0.283) | (1.410) | (0.571) | (2.633) |
| Log GDP pc | −2.525*** | −2.250** | −3.184*** | −2.421** | −2.070*** | −3.698** | −5.088*** | −5.533*** |
| | (0.722) | (1.005) | (0.790) | (1.108) | (0.631) | (1.765) | (1.267) | (2.119) |
| Control of corruption | −0.130 | −5.351*** | 0.469 | −0.336 | 0.540 | −3.439 | 0.993 | −3.770 |
| | (0.365) | (0.955) | (0.432) | (3.500) | (0.356) | (2.491) | (0.707) | (4.962) |
| Business registration | 0.00375 | 0.00466 | −0.00307 | −0.000819 | −0.0148** | 0.00765 | −0.0173 | 0.00545 |
| | (0.0175) | (0.0230) | (0.0135) | (0.0177) | (0.00730) | (0.00768) | (0.0176) | (0.0175) |
| Survival self-expression | 1.201*** | 1.838 | 1.347*** | 2.093 | 0.536* | 3.326*** | 1.744** | 5.202*** |
| | (0.416) | (1.096) | (0.468) | (1.585) | (0.307) | (1.258) | (0.698) | (1.952) |
| Traditional rational | −1.664*** | −2.372* | −1.680*** | −3.172** | −0.944*** | 0.0530 | −2.482*** | −2.861 |
| | (0.289) | (1.188) | (0.284) | (1.563) | (0.209) | (1.193) | (0.432) | (2.105) |
| Constant | 29.63*** | 24.97** | 36.07*** | 26.88** | 24.09*** | 39.29** | 58.21*** | 60.65*** |
| | (7.092) | (9.731) | (7.777) | (10.51) | (6.311) | (16.50) | (12.56) | (19.92) |
| Observations | 266 | 81 | 266 | 81 | 266 | 81 | 266 | 81 |
| Countries | 39 | 31 | 39 | 31 | 39 | 31 | 39 | 31 |
| Partial $R^2$ (first stage) | | | 0.215 | 0.166 | 0.215 | 0.166 | 0.215 | 0.166 |
| *F*-stat (first stage) | | | 41.21 | 12.11 | 41.21 | 12.11 | 41.21 | 12.11 |
| Endogeneity | | | 0.0038 | 0.0851 | 0.0056 | 0.9135 | 0.0011 | 0.2417 |
| Under-identification | | | 0.0003 | 0.0130 | 0.0003 | 0.0130 | 0.0003 | 0.0130 |
| Weak-identification | | | 0.0006 | 0.0796 | 0.0038 | 0.8582 | 0.0002 | 0.2998 |
| Centered $R^2$ | 0.520 | 0.342 | 0.348 | −0.037 | 0.097 | 0.393 | 0.248 | 0.310 |
| *F* | 8.290 | 14.37 | 7.686 | 5.183 | 5.786 | 6.138 | 7.739 | 7.791 |

This table is a replication of Table 1 with a particular focus on developed and developing countries. We substitute GDP per capita dummies with GDP per capita in log form. This adjustment is necessary; otherwise there are too few observations per dummy variable category in the developing subsample, rendering the estimation not applicable. Countries are assigned to each category based on the classification used by the WB

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

entrepreneurship in that industry in the following year dropped by 0.06 % (0.03 %). This impact is significant at the 5 % (10 %) level. If horizontal FDI in the transformative (business-oriented) industries increases by one standard deviation (that is 0.85), the entrepreneurship rate in the same industries drops by 0.01 (0.002). Given that average total early-stage entrepreneurship rate in these industry clusters is 1.99 and 1.25 %, the negative effect of horizontal FDI is, again, economically quite small.

### 5.3 Country level analysis: developed versus developing countries

We also split the sample into developed and developing economies.[14] In line with Navaretti and Venables (2004), our data show that advanced economies are more attractive destinations for FDI via M&A than developing countries: FDI flows to the former are on average two times greater (2.86 vs. 1.41 %) relative to the size of the host countries' economy. Furthermore, developed and developing countries in the sample also show considerable divergence among the control variables (see online appendix, supplement Tables 4a and 4b). When we replicate the aggregate analysis for both country subsamples, we find that FDI is negatively associated with domestic entrepreneurship only in developed countries, but not in developing economies. This evidence suggests that there are systematic differences in the responsiveness of entrepreneurship to FDI based on the development stage of the national economies. Table 3 reports more detailed results.

## 6 Conclusions

In this paper, we investigated the effects of FDI via M&A on domestic entrepreneurship at both country and industry levels. Our hypotheses suggest that FDI could either stimulate or inhibit local entrepreneurship. While foreign enterprises bring knowledge and superior technology that can spillover into the local economy, they are also the source of increased competition in product and factor markets and may raise the opportunity cost of entrepreneurship compared to employment. The direction of the response of domestic entrepreneurship to FDI inflow relies on whichever of these two effects dominates.

We find FDI via M&A has a negative and significant effect on domestic entrepreneurship for the economy as a whole and for some sectors. In other sectors, the effects are not significant, but in none are positive effects identified. These results are robust to alternative specifications of the dependent variable and additional control variables (see online appendix, supplement Tables 7a, 7b and 7c). Moreover, we find that the negative FDI inflow effect is strongest and statistically significant in developed economies.

How do we explain the negative impact of FDI on entrepreneurship? We suggest two spillover channels as potential explanations. Both constitute interesting avenues for future research:

(1) The literature suggests that the competition effect is the principal source of crowding-out in the intra-industry context. If local enterprises fail to adopt superior technologies and to improve their productivity in response to the increased competition from the foreign entrant, they will be forced to exit. On the other hand, positive intra-industry spillovers from FDI may be limited because this type of knowledge diffusion, if it takes place, would convey advantages to domestic competitors.

Our results suggest that FDI-induced competition seems to dominate the benefits of knowledge diffusion in transformative and service industries. The majority of FDI inflows in our dataset are concentrated in these industries, together with significant negative spillover effects. On the other hand, when the competition between foreign firms and the local economy is limited, as in the extractive industries, the crowding-out effects of FDI inflows are not significant.

(2) Foreign firms can attract scarce domestic resources for example talented and skilled workforce. This translates into additional competitive pressure in labor markets, with the potential to change the entrepreneurial landscape in the local economy. Given the wage structures offered by foreign companies are typically attractive by domestic standards, especially for skilled or managerial labor, potential entrepreneurs may take positions in these firms in preference to entrepreneurial activities. Therefore, it is plausible to expect that FDI presence exerts negative effects on domestic firm formation.

This study is not without limitations. First, like most studies in the field, our analyses do not take into account the qualitative aspects of entrepreneurship (e.g., job creation or technological innovation). Negative effects of FDI on the frequency of entrepreneurship does not necessarily reduce overall 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

[14] We follow the definition of The World Bank (WB) in our categorization. If a country's classification changes over the sample period (applies to Argentina, Chile, Croatia, Latvia, Malaysia, Mexico, Poland, Russia, Uruguay and Venezuela), we use the most recent WB categorization for the whole period.

countries. Second, as we include all countries that satisfy our data constraints, our results may be subject to a data availability bias. Although this bias typically works against developing countries, the databases we merged cover a substantial number of developing countries and many more than in previous studies. Third, our findings refer only to FDI via M&A, which represents up to 80 % of foreign investment. Further work is needed to include the impact of greenfield FDI.

The key implication of our findings is that FDI poses both opportunities and challenges to domestic firm development, and policy makers in host countries should not take the FDI benefits for granted in the local economy. First, equipped with superior knowledge about 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 while 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 FDI-induced competition becomes less of a threat and superior foreign knowledge is better absorbed.

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 centers 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.

**Acknowledgments** The authors acknowledge helpful comments from two anonymous referees, as well as Niels Bosma, Jolanda Hessels, Klaus Meyer, Wim Naude, Erik Stam and participants in a seminar at the National Academies in Washington, the German Institute for Economic Research in Washington (DIWDC), the Maastricht School of Management, Utrecht University School of Economics and session participants at the 2013 European Economic Association Meetings in Gothenburg, at the 2013 Babson College Entrepreneurship Research Conference in Lyon and at the workshop on 'Institutions and the Allocation of Entrepreneurship' in Utrecht. Any remaining errors are their own. We also gratefully acknowledge financial support from the Dutch Ministry for Economic Affairs.

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