BEYOND NATIONAL REACH?

An Institutional Analysis of the High-Skill Online Gig Economy in the Global North

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Buiten bereik van nationale structuren?

Een institutionele analyse van de online-kluseconomie voor hoogwaardige diensten in de Global North

(met een samenvatting in het Nederlands)

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"Practical men who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist."

John Maynard Keynes

Preface

When I started on this PhD project in 2018, the idea of "platformisation" revolutionizing the world we live in was still dominant in the public discourse. Especially the "disruptive" nature of Uber, as part of the "sharing economy", was the talk of the town. Back then, I witnessed a debate which was polarised between a "platformisation is taking over" and "platformisation is only on the fringes" camp. I found it difficult to position myself in one of these camps. On the one hand, I did not believe that online platforms would be the future of work, and that soon we would all be part of the gig economy. I thought the success of Uber was more due to a legal trick than the platform making things more efficient, and already saw an emerging legal response to it. On the other hand, I worried about the possible fundamental changes platformisation could have on the way our society functions, particularly on income security and labour protection of workers in already marginalised positions. How we envision the emergence, influence, opportunities and risks of platformisation determines what we will do to protect workers and in what way. Hence, I opened with a quote of the famous economist John Maynard Keynes that always stuck with me when I thought about why I started this PhD project.

While it is mostly frowned upon in positivistic quantitative social sciences, this already shows I was not, and am not, neutral in this debate. However, I believe it is more harmful to ignore one's personal normative stance than to present them openly: my passion for the topic I examine comes from an ambition to contribute to a society where workers, especially those from marginalised communities, can create stable and secure lives with fair wages, and opportunities to develop how they see fit. I realise that the questions examined in this dissertation only cover a marginal fraction of this broader ambition, and that it is more analytical than practical in nature. The real important questions, regarding what fair wages are, and what a just society looks like, are not even touched upon in this dissertation. I gladly leave these political questions to other scholars and activists, who I admire and support. In the end, while not neutral, I am an analytical scholar, who wants to critically assess my own assumptions as much as others.

Taking an analytical approach, my goal in this dissertation is to see how the platformisation of labour truly changes the position of workers. In doing so, I push back against both polarised narratives on digital labour platforms and provide empirical evidence that can distinguish the strong arguments from the weak ones. While this dissertation can only make a start in providing a clearer understanding of the impact of digital labour markets, I hope that when you read this, you will feel enlightened on the online gig economy and its impact. I especially hope it will give some answers to how the online gig economy changes the situation of workers, but also where the leverage and opportunities lie to mitigate potential risks.

Finally, I hope it is a joyful read. I want to dedicate my dissertation to my deceased grandfather Cornelis "Kees" van Slageren. He taught me to always challenge beliefs and assumptions by actively seeking for contradicting opinions and evidence. Beliefs and assumptions of others, but most importantly, those of your own.

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Introduction

Since the 2008 financial crisis, online platforms that match the supply and demand of flexible labour have emerged and radically transformed our economy (Schor, 2017). Most notably, the ride-hailing platform Uber swept across countries worldwide "disrupting" the taxi market. Since, regulating institutions in many countries have responded by banning or regulating Uber (Koutsimpogiorgos et al., 2022). However, their momentum continued, and soon gig platforms matching other types of work started, such as odd jobs, delivery, cleaning, care, and programming. And while the amount of labour hired through online platforms comprises a relatively small part of the current economy, its impact on existing industries is significant (Schor, 2020). Furthermore, it is the common expectation that the gig economy will continue to grow (De Stefano, 2015).

Although the financial crisis of 2008 might be the direct impetus for the gig economy to emerge, it is not the cause (Woodcock & Graham, 2019). Various pundits and academics, often paid by platforms such as Uber (Lawrence, 2022), spread the idea that gig platforms were an example of radical innovation and the kind of disruption needed to free the entrepreneurial spirit (Ravenelle, 2017). However, from a historical structural perspective, one can see that the forces driving the gig economy were long coming (Schor, 2020). Therefore, while Uber is either banned or failing as a business model in every country (Thelen, 2018), the gig economy as a whole remains vital and influential.

The gig economy can be seen as a collision of two longstanding social trends: digitalisation and labour flexibilisation. First, while the internet already exists for multiple decades, its widespread accessibility is relatively new. Since the appearance and popularisation of easily transportable digital devices, such as smartphones and laptops, and the increasing accessibility of internet spots and Wi-Fi in public space, it has become common for people worldwide to be continuously connected to the internet (Woodcock & Graham, 2019). This is especially important as the internet now reached people that did, or were willing to do, the kind of jobs marketable in the gig economy. People on and off the job market now had easy access to the internet: students, migrants, cultural workers, informal caregivers, and people living in rural areas or the Global South (Graham et al., 2017; van Doorn et al., 2020). This overall accessibility of the internet made it possible to keep in touch with a workforce that is geographically dispersed, difficult to reach and hard to monitor.

However, it is important to note that digital changes alone would not suffice as an explanation for a boom in the gig economy. In the end, people need to be willing to commodify themselves on these platforms (Wiens-Tuers & Hill, 2002; Wood et al., 2019a). In this perspective, the gig economy can be understood as a product of a longstanding increase in labour flexibilisation (Stanford, 2017). Focusing on the Global North, there has been an increase in self-employed workers since the 1980s. Political practices deregulated markets and facilitated globalisation. This deteriorated the power of trade unions and increased non-standard employment in response to the volatility of labour demand (Stanford, 2017). Due to a weaker position of trade unions, the secure employment position

fell under strain. Simultaneously, political actors made it more attractive to market as a competitive (solo employment) company rather than an employee (Gottschall & Kroos, 2007). The emergence of solo self-employed workers further weakened organised labour's position, creating a downwards spiral.

This change towards more labour flexibilisation was not merely a result of changing power dynamics, but is at least partially also based on the workers' preference. A substantial part of (potential) employees in the Global North preferred a flexible work arrangement, even if it was not economically beneficial. And in the gig economy, while workers might have various grievances, they are still keen to stress that they appreciate the flexible aspects of the work (Woodcock & Graham, 2019). Especially workers with a scarce set of desirable high skills use the flexibility to develop their personal life, while their market position can still give them a decent income. In addition, workers with desired skills that do work that is not geographically tethered, such as programming, design or accounting, can use the global demand for their skills to leverage a comfortable position.

This dissertation focuses on this category of workers doing high-skill digital work. While they work in an industry with a lot of comparative leverage, the platform's global nature provides high competition. Therefore, like in every economic sector, social stratification and inequalities occur. The question is what these inequalities are based on and what influences such inequalities.

An unknown influence on the high-skill online gig economy is that of national institutions. The rules, habits, norms and regulations in a country are traditionally one of the major forces that shape labour market dynamics. However, regarding the high-skill online gig economy, there is much less known about national institutional influences. Theoretically, there are competing arguments on institutional influences in the high-skill online gig economy. On the one hand, globalisation makes direct protection difficult, thereby evoking the argument that these online platforms create an "institutional void". On the other hand, national institutions facilitate the scarce skills of this market, thereby indirectly shaping online gig economy dynamics. Both of these arguments deserve to be put under empirical scrutiny. Therefore, focussing on the Global North, the dissertation addresses the following main research question:

To what extent and how do national institutions influence inequality between workers in the high-skill online gig economy in the Global North?

The current chapter provides an overview of the dissertation's rationale, approaches and main findings and limitations. I begin by briefly elaborating on the functioning of a gig platform, and I give a typology of gig work based on the skill level and the geographical nature of the work. Based on that typology, I argue why my focus is on the high-skill online gig economy. Next, I give insight into the institutional approach taken in this dissertation and which major institutional theories are introduced, in particular the Varieties-of-Capitalism theory and sociological theories on educational systems. I then explain the methodological approaches taken in the empirical chapters of this dissertation. I then conclude this chapter with a summary of each of the chapters.

1.1 What are Gig Platforms, and What do They do?

I conceptualise gig platforms from an economic perspective (Evans, 2003; Gawer, 2014; Rochet & Tirole, 2003). From this perspective, gig platforms are commonly understood as two-sided markets, with the gig platform connecting potential workers and labour requesters. In this setting, gig platforms function as labour market intermediaries, similar to alternative intermediaries such as temp agencies.

Gig platforms lower barriers to market entry, allowing marginalised communities to participate and commodify their skills, and facilitate exchanges between actors that could not otherwise transact with each other. Thus, platforms facilitate those otherwise impossible transactions, thereby creating economic value. They reduce transaction costs, including search, bargaining and monitoring costs (Furubotn & Richter, 2010; Lehdonvirta et al., 2014). They reduce search costs by providing a shared marketplace for workers and requesters and facilitating relevant information for a good match. In addition, they lower entry barriers for workers and requesters, making it easier to participate in a market and find suitable demand. Furthermore, the bargaining costs are lowered by providing precise tools to express the bargaining position for both workers and the requesters. Workers can indicate their requested hourly wage, while requesters can signal the available budget for a given task. Finally, gig platforms lower enforcement costs by institutionalising trust and reputation systems. In addition, they function as conflict mediators when labour disputes occur.

Since gig platforms are two-sided markets, their pricing and other strategies are strongly affected by the indirect network effects between the two sides on the gig platform (Gawer, 2014). Indirect network effects are defined as "effects [that] arise if the benefit to users in at least one group depends on the number of other users in the other group" (Hagiu & Wright, 2011, p. 5). These indirect network effect fuels self-reinforcing feedback loops that can result in a "winner-takes-all" mechanism with one or few platforms coming to dominate (Eisenmann et al., 2006). These strong feedback loops create a strength and vulnerability for gig platforms. On the one hand, these network effects create cumulative advantage, making bigger platforms more desirable and thus making them increase even more in size. On the other hand, bad media coverage or coordinated action from either workers or requesters could facilitate cumulative disadvantage, creating a downwards spiral for the platform.

What type of jobs are transacted on gig platforms, and what are the workers' economic positions? The variety of jobs facilitated by gig platforms is highly diverse but can broadly be categorised into four groups based on two dimensions: high vs low skilled, and online (digitally transferable) vs onsite (geographically tethered) work. I briefly discuss these four categories of gig economy, and how working conditions tend to differ across these categories.

The first category is the low-skilled onsite work. The most famous examples are ride-hailing and food delivery tasks, but also include other services such as cleaning and pet sitting. Income is generally low and highly fluctuating, which makes it hard to make a

decent living while working full-time. However, it is important to realise that some of these service markets were already under-protected and harsh for workers, most notably the cleaning sector. Workers providing low-skill onsite gig jobs get the most academic and non-academic attention (Frenken & Van Slageren, 2018; Schor, 2020; Vallas & Schor, 2020), probably due to two main reasons. On the one hand, these jobs are generally low-income jobs with a serious risk of exploitation, especially from a Global North perspective of labour rights and minimum income standards. On the other hand, this work's locality allows national regulators to regulate and protect those workers since they still fall within the jurisdiction of national regulators. This ultimately makes the labour position of these workers a legal and political discussion, balancing the power of platform capital versus labour.

The second category of gig work consists of high-skill onsite work, such as odd jobs, tutoring and performance artists. These jobs are generally better paid due to the scarcity of the workers' skills. The workers are attracted by the flexibility that platforms provide (Vallas & Schor, 2020), which existed to some extent in these sectors before the advent of gig platforms. The main concern, however, is that the irregular nature of the work demand often reduces the desired autonomy and flexibility substantially. Still, given the local nature of this work, protection and regulation is ultimately a political question, since national regulators have the power to regulate.

The third category is low-skill online work. This work, mostly called micro-tasking or crowd work, involves giving feedback on machine learning programs, classifying the content of images, editing computer-generated texts and transcribing audio clips (Lehdonvirta, 2018; Wood et al., 2019a). This category of gig work probably comes with the most significant concerns for worker conditions. Since it is digitally transferable, the work can be performed globally, creating an extremely competitive environment. Due to the low-skilled nature of the tasks, the primary competitive elements that workers can leverage are speed and wage (Berg, 2016; Berg & De Stefano, 2018), which results in worrisome work schedules and salaries far lower than would be considered the minimum in most of the Global North. However, since the work is done on a global platform, there is little that national regulators can do for their workers besides providing welfare state benefits and providing workers alternative employment. The conclusion is, therefore, that this work is primarily done in countries with low unemployment benefits (such as the US) and countries in the Global South (Graham et al., 2017; Lehdonvirta et al., 2014).

The final category of gig work is the section of the gig economy that is the main focus of this dissertation, namely high-skill online work (Stephany et al., 2021). This category includes professional freelancers who offer digital design, translation or programming services. Generally speaking, it is possible to maintain a stable and sufficient source of income on these platforms as long as a continuous stream of clients is maintained. The regulatory protection is minimal due to the global nature of the work. However, by leveraging the scarcity of their skills, workers can maintain some bargaining power (Braesemann et al., 2021; Sutherland et al., 2020). The primary societal question involving this category is whether leveraging scarce skills is enough to withstand the downwards wage pressure of a global labour market.

1.2 Why the High-Skill Online Gig Economy in the Global North?

The question of labour protection against the commodification of the global labour market in the high-skill online gig economy is an important one, and it is difficult to answer. The high-skill online gig economy is clearly highly international, where global competition is present. To illustrate, most requesters in the high-skill online gig economy reside in countries of the Global North, while the countries with the highest share of gig workers are systematically from the Global South (Anwar & Graham, 2022; Graham et al., 2017), mainly on the African or Asian continent.

A labour market where one can compete across the world, due to the de-localised nature of work and digital communication tools, poses the risk of a race-to-the-bottom of labour standards, especially in the Global North. Countries in the Global North generally have high levels of labour protection and relatively high wage expectations. However, these rights and expectations differ substantially between countries. A competitive international market, without national restrictions or other influences, would then, according to economic logic, lead to a "wage convergence" (Beerepoot & Lambregts, 2015). In other words, this would imply lower wages in high-wage countries, possibly even below their national minimum wage.

For geographically tethered work, national institutions can prevent this downward spiral of wages in various ways. The most direct and obvious way is national regulation. National governments can set minimum wages, maximum work weeks, and make multiple secondary labour rights mandatory. In addition, regulators can enforce those rights because the locality of work constrains labour requesters from circumventing this regulation by crossing borders.

However, this is not the only way national institutions protect (mainly higher-skilled) workers, of which two are especially noticeable to discuss. First, national institutions can protect their workers by training them to acquire certain specific skills, thereby leveraging the national comparative advantage (Estevez-Abe et al., 2001; Porter, 2011). Different skill profiles parcel into different labour market segments, where competition happens within but not between segments. The most prominent theories on how this is manifested come from two branches of literature. The Varieties-of-Capitalism literature (Amable, 2003; Hall & Soskice, 2001; Hancké et al., 2008) argues that countries with high levels of employment protection and other regulations allow their workers to specialise in specific skills, whereas countries with limited regulation foster the specialisation in more general skills. The second branch of literature is that of educational sociology on different educational systems (Allmendinger, 1989; Andersen & Van de Werfhorst, 2010; Bol & Van de Werfhorst, 2011; Shavit & Muller, 1998). In the literature, the vocational orientation of an education system manifests certain skill specialisations. Since labour competition mainly occurs within, not between, skill segments, labour force specialisation protects the national labour force from global competition and maximises national comparative advantage (Porter, 2011).

The second way national institutions hamper complete market competition in the labour force is by creating occupational closure (Bol, 2014; Bol & Weeden, 2014; Weeden, 2002). Occupational closure is a specific form of social closure where occupational groups set up

institutional boundaries to access, most notably via educational credentialing (Bol & Van de Werfhorst, 2011). Occupational closure limits free access to the labour market, limiting competition and creating economic rents (Weeden & Grusky, 2014). While occupational closure is mainly set up by occupational groups, it is generally facilitated by national governments. National regulatory systems legitimise the closure practice by creating educational structures that facilitate occupational closure and create economic value for employers. By finetuning the education system to the specific occupation, workers will have acquired more relevant skills and know-how for the particular occupation (Bol & Van de Werfhorst, 2013b; Rözer & Van de Werfhorst, 2020). The acquisition of occupational credentials is strongly linked to valuable traits in the labour market (Hanushek et al., 2017; Rözer & Van de Werfhorst, 2020). Since educational credentials are nationally given, and the transferability of necessary degrees is often limited (Lancee & Bol, 2017), this occupational closure protects an occupational labour market from workers outside.

Nevertheless, whether these ways of labour protection still affect a globally competing labour market such as the high-skill online gig economy is unclear. Online gig platforms generally do not enforce national labour regulations other than when it is stated in their terms and conditions (Berg & De Stefano, 2018; Wood et al., 2019b). Furthermore, the platforms claim to "unbundle" skills from occupations and facilitate informal learning that would make educational credentials and educational learning obsolete (Gomez Herrera et al., 2017; Horton, 2017). However, the empirical assessment of the impact of national institutions, especially in other ways than direct regulation, is still lacking in the academic literature. This dissertation tries to fill that gap in the literature.

1.3 Institutional Perspectives

Socio-economic studies on institutions are vast and diverse, with little agreement on an accepted definition of institutions. In general, institutions are "formal and informal rules, monitoring and enforcement mechanisms, and systems of meaning that define the context within which individuals, corporations, labour unions, nation-states, and other organisations operate and interact with each other" (Campbell, 2004, p. 1). However, both the scope of "institutions" and the directional influence is dependent on which perspective is chosen in the social science literature.

Within the debate of institutions, three categories can be defined, which all have their own conceptualisation and perspectives (Hall & Taylor, 1996; Koelble, 1995): rational-choice institutionalism, historical institutionalism and sociological institutionalism. Rational-choice institutionalists argue that institutions are constraints for individuals to maximise their utility via goal-directed behaviour (e.g. North, 1990, 1991). In this setting, good institutions lower uncertainty and limit opportunistic behaviour, lowering transaction costs and increasing efficiency. In the perspective of rational-choice institutionalists, preferences are exogenous, and although they argue that institutions are both formal and informal, they focus on the former. In particular, they emphasise the importance of property rights, rent seeking and transaction costs.

In contrast, the historical institutionalist approach emphasises informal procedures more than rational-choice institutionalists do (e.g. Steinmo et al., 1992; Thelen, 1999). They generally define institutions as formal and informal procedures, routines and norms, which can be legally binding but do not have to be. In addition, they assume an interactive relationship between individual preferences and institutional structures, where preferences are influenced by the structures, and the structures result from different political pressures competing for influence. According to historical institutionalists, path dependency, unintended consequences, and political conflict are vital.

The third group of institutionalists are sociological institutionalists, although this branch is not confined to the sociological discipline (Granovetter, 1985; Granovetter & Swedberg, 2011; Powell & DiMaggio, 2012). In contrast to the former two approaches, sociological institutionalists accentuate informal institutions, which they often characterise as "rationality" or "culture". Their definition of institutions includes symbol systems, cognitive scripts and "frames of meaning". Social norms, social networks, and symbolic interaction are of importance. Most of the sociological institutionalist literature focuses on how institutions influence preferences and logic. Therefore, they reject the idea of purely rational behaviour.

These three institutionalist approaches all have their strengths and weaknesses and are therefore more complementary, looking at another side of the same coin, rather than in conflict. Throughout this dissertation, facets of all three branches of the institutionalist literature are employed. However, the emphasis on skill formation and worker conditions directs this dissertation to examining two branches of institutional literature: the Varieties-of-Capitalism literature and the literature on educational systems. Both of these branches can best be characterised as a part of the historical institutionalist approach.

The first important theoretical direction is closely linked to the historical institutionalist: the Varieties-of-Capitalism (VoC) literature (Amable, 2003; Hall & Soskice, 2001; Hancké et al., 2008). This theory originated as a reaction to Fukuyama's (1992) "end of history" narrative stating that since the collapse of the USSR, liberal capitalism has prevailed as the best economic and institutional system, creating an convergence across the world. Contrary to Fukuyama, the VoC literature argues that there are important differences *between* capitalist structures across countries (focussing on the Global North), and to understand them, one needs to look at differences in institutions, which channel economic and social activity and influence preferences among workers and employers.

In its original form, the VoC literature identified two different archetypical institutional structures. Liberal Market Economies (LMEs), such as the UK and the US, are characterised by decentralised social dialogue and strong market competition between firms. Employment protection is limited, making labour flexibility high. Since coordination among social partners is limited, structured investment via education systems is hampered, thereby focussing the skill accumulation of (potential) workers towards general skills utilisable in various settings. In contrast, Coordinated Market Economies (CMEs), such as Germany and Austria, can be identified by a strongly coordinated social dialogue and corporate collaboration with industry associates. Employment protection is

higher than in LMEs, giving workers incentives to specialise within a firm or occupation. This, combined with the coordination between education systems and the labour market, makes workers acquire a more specific skill set, with higher proximity but lower transferability to different settings. Since its origin, the VoC literature has adapted this dual typology by adding additional categories, such as Dependent Market Economies and Mediterranean Market Economies (Nölke & Vliegenthart, 2009) or by moving beyond broad categorisations and examining specific characteristics instead (Hall & Gingerich, 2009; Höpner, 2007). However, its logic and relationship between institutions, skills, and credentials remained intact.

The second theoretical direction on which my thesis is draws developed in parallel but distinct from the VoC literature, mainly in the sociological discipline: the perspective of national education systems (Allmendinger, 1989; Andersen & Van de Werfhorst, 2010; Bol & Van de Werfhorst, 2011; Shavit & Muller, 1998). This theory evolved from literature examining stratification and inequality differences from a comparative perspective. In this branch, scholars found substantial national differences based on how the educational systems were structured, which they call "the institutional embedding" (Andersen & Van de Werfhorst, 2010; Forster, 2020; Van de Werfhorst, 2011). Although they generally do not clearly define institutions, they mainly examine formal structures, which they explain as a compromise between different educational "functions" and political goals. Therefore, one can argue that this line of thought would fit a historic institutionalist approach. And it is thus not surprising that there is considerable overlap between academic scholars that focus on education systems and those that examine VoC explanations.

The institutional literature on education systems has identified three important characteristics in understanding cross-national differences (Allmendinger, 1989; Bol & Van de Werfhorst, 2013b; Kerckhoff, 2003): 1. The external differentiation; 2. The level of standardisation; and 3. The level of vocational orientation. The external differentiation refers to the extent to which students are placed in different educational tracks, which are parallel but in a well-known hierarchy (Allmendinger, 1989; Shavit, 2007; Shavit & Muller, 1998). The level of standardisation relates to the degree to which the quality of education meets the same standards nationwide, via, for example, central exams or standardised budgets (Woessmann, 2003, 2005). The level of vocational orientation indicates the extent to which education is occupationally structured, providing students with specific vocational skills (Breen, 2005; Rözer & Van de Werfhorst, 2020). The positioning of these three dimensions of educational systems reflects trade-offs between four central functions of education (Bol & Van de Werfhorst, 2013a): optimising labour market opportunities, optimising skill acquisition, optimising equality of opportunities, and socialising young people into society. The three dimensions create trade-offs on these central functions. For example, high levels of external differentiation improve students' labour market opportunities but reduce the equality of opportunities. The relevant dimension in this dissertation is the level of vocational orientation since it directly relates to skill acquisition for particular gigs.

Although distinct theoretical branches, there is a considerable theoretical overlap between the VoC arguments and the arguments on national educational systems (for example, it would be logical that CMEs also have higher levels of vocational orientations). However, in this dissertation they are considered as separate theories since, despite the overlap, there are important theoretical and empirical discrepancies between them. Empirically, there are certain countries for which the two different institutional theories do not align. For example, a country such as Japan is a CME with low vocational orientation levels, and the "new" VoC categories in Southern and Eastern Europe cannot be systematically categorised based on their vocational orientation. Theoretically, the mechanism of skill acquisition in the VoC literature is primarily based on on-the-job learning and is therefore directly linked to employee and employers' behaviour. In contrast, the literature on education systems focuses on the structures within the education system and stops when workers enter the labour market. Therefore, the VoC literature bases their labour market argument on a Human Capital Theory based "asset theory" (Becker, 1964; Streeck, 2011), while the education systems literature argues from both Human Capital Theory and alternative Signalling Theory perspectives (Bills, 2003; Protsch & Solga, 2015; Spence, 1973).

1.4 Methodological Approach

In studies on the high-skill online gig economy, some scholars used in-depth insights via interviews or survey data (Martindale & Lehdonvirta, 2021; Nemkova et al., 2019; Sutherland et al., 2020; Wood et al., 2019b, 2019a). Interviews, although providing in-depth information on personal experiences and perceptions, cannot be generalised over broad populations and do not show structures beyond workers' direct perception. Surveys, on the other hand, can show generalisable unconscious trends, but when studying the high-skill online gig economy, they are restricted to relatively small samples and cannot account for discrepancies between intentions and actual behaviour.

To avoid both drawbacks, this dissertation contributes to the existing literature on the high-skill online gig economy by examining behavioural data collected from gig worker profiles, thereby explicitly focussing on workers' behaviour. By examining how the labour market behaviourally functions, contrast to asking actors how it functions, implicit structures can be examined. More specifically, I acquired data by collecting the gig profiles and reviewed work history of workers active on one of the biggest online gig platforms worldwide. The gig platform in question specialises in high-skill jobs that are digitally transferable, ranging from programming and design to writing tasks. This gig platform offers a thorough overview of its gig workers via their publicly available profiles, including the gig workers' ratings, requested hourly wages, completed skill exams, presented skill sets, educational credentials, work history, and previous work experience. On this platform, workers can create a profile without needing a specific kind of 'entry certificate' such as educational credentials. Hiring via the platform can occur in two ways. First, a requester can directly contact a gig worker via their profile to hire the

worker for a particular task. Second, a gig requester can place the gig job on the platform, on which the various gig workers can apply with an offer and introductory text. When the gig requester is satisfied, they can hire one of the gig workers that applied for the job.

Since the gig requester is free to choose an applicant and gig workers are free to apply, the algorithmic control is relatively modest compared to, for example, a platform like Uber. However, the impact of algorithmic structures should not be underestimated. Workers experience constant pressure to get new gigs and positive reviews to 'game' the algorithms, so that they come on top of the applicant list (Duggan et al., 2020; Rahman, 2021). Therefore, some workers limit their work on the platform or change the type of work they provide to remain profitable (Cansoy et al., 2020; Schor et al., 2020).

TABLE 1.1 | Overview of empirical chapters.

CHAPTER	RESEARCH QUESTION	COUNTRY SELECTION	DEPENDENT VARIABLE(S)	METHODOLOGY
3	Does the high-skill online gig economy create a "death of (institutional and geographical) distance"?	26 European countries	1. Number of gig hirings between two countries 2. Total money flow in USD between two countries (Ln)	Gravity Model of Trade: 1. Negative binomial Regression Models 2. OLS Regression Models
4	Are specific skills by workers active on online platforms correlated with the same individual and national institutional factors as in traditional offline labour markets?	23 countries in the Global North	Specificity of Skills hired for	Multilevel Ordinal Logistic Regression Models
5	To what extent differences in education systems and labour market institutions influence the labour market returns of education in the high-skill online gig economy?	26 countries in the Global North	Project value in USD (Ln)	Multilevel Linear Regression Models

Examining online behavioural data to study gig platforms is relatively novel but not unique. Herrmann and colleagues (forthcoming) have used online gig profiles before to study requested hourly wages among workers. Furthermore, various scholars linked to the Oxford Internet Institute (e.g. Kässi & Lehdonvirta, 2022; Lehdonvirta et al., 2019; Stephany, 2021) have used behavioural transaction data to examine, among others, "liability of foreignness" (Lehdonvirta et al., 2014) and the impact of skill exams on workers' income (Kässi & Lehdonvirta, 2022). However, this dissertation is unique in taking an institutional approach to studying those behaviour trends.

The chapters of this dissertation use various quantitative methods to examine the relevant questions using this behavioural data. They use different country selections within the Global North, and the appropriate level of analysis and essential explanations vary. Table 1.1 gives an overview of the case selections and methodologies used in the empirical chapters of this dissertation.

1.5 Overview of the Four Studies

1.5.1 First study: Defining the Scope of the Gig Economy

In the first study, I provide an overview of the gig economy phenomenon. Although the "gig economy" is an often-used term, generating a lot of research, it is unclear what the gig economy exactly is and what relevant analytical dimensions it entails. Following a literature review, I conceptualise the gig economy along four dimensions: online intermediation, independent contractors, paid tasks, and personal services. The boundaries of those four dimensions are inherently blurry. Therefore, it is possible to derive both a narrow definition of the gig economy ("ex-ante specified paid tasks carried out by independent contractors mediated by online platforms") and broader definitions that can include offline intermediation, employees, unpaid tasks and/or asset sharing. Choices made among those dimensions are vital to what is considered gig economy, what are present societal issues involving the gig economy, and what solutions are there for those issues. I argue that those four dimensions relate to four regulatory questions: how should online platforms be regulated; how should gig workers be regulated; what counts as paid work; and should we treat labour earnings different from asset sharing earnings?

1.5.2 Second study: Is the High-Skill Online Gig Economy Beyond National Reach?

In the second study, I assess whether the high-skill online gig economy in the Global North constitutes a global labour market where geographical and institutional localities do not influence hiring behaviour. I examine almost 30,000 hirings between 26 European countries, visible via the work experience on the online profiles of high-skill gig workers. By employing gravity models on the number and total monetary volume of trade between countries, I find that the high-skill online gig economy does not constitute a global labour market, but that geography, in various ways, matters. High-skill online gig platforms facilitate off-shoring work from high- to low-wage countries, even within Europe, and geographical proximity still positively influences hiring patterns between countries. Furthermore, countries with a common official language have more service trade compared to countries that do not have a common language. However, interestingly, differences in regulatory institutions and national cultural norms do not affect hiring patterns at all. Therefore, our study suggests that high-skill online gig platforms create their own institutional framework, thereby largely circumventing national regulation.

1.5.3 Third study: Are the Drivers of Specific and General Skill Specialisation the same in the High-Skill Online Gig Economy as in the Traditional Labour Market?

In the third study, I examine one possible explanation for why the high-skill online gig economy does not constitute a global labour market via skill specialisation of the labour force. If national institutions influence skills acquisition similarly in the online gig economy and offline labour market, existing geographical inequalities will still manifest. Based on the educational sociology and labour economics literature, I expect that educational training and longer job tenure on the individual level affect whether gig workers are hired for specific or general skills. On the national level, based on the varieties of capitalism and education systems literature, I hypothesise that stronger employment protection and a higher level of vocational specificity increase the chance a worker is hired for specific skills in the online gig economy. Based on multilevel ordinal logistic regression models, I find that individual education does predict the type of skills a worker is hired for, but job tenure does not. Furthermore, no evidence is found of national institutions impacting the kind of skills workers are hired for in the expected direction. Instead, a weak indication for an opposite direction was found. These results suggest a possible substitution effect, where workers with skills not valued in the traditional labour market work in the high-skill online gig economy.

1.5.4 Fourth study: Educational Labour Market Returns and Transferability of Educational Degrees in the High-Skill Online Gig Economy

In this fourth paper, another possible reason for the absence of a global labour market is analysed: the limited transferability of degrees. When the value of educational degrees is hampered when crossing borders and institutions, local and proximate workers will have an advantage over foreign and distant workers. Before the transferability of degrees can be examined, however, the labour market returns of educational degrees should be established. The high-skill online gig economy strips skills from occupations and creates skill-related quality signals, which could replace educational credentials as a signalling device in the high-skill online gig economy. Therefore, this chapter has a double focus: examining labour market returns and degree transferability. Using multilevel linear regression models on more than 100,000 completed transactions, I show that presenting educational credentials on one's gig profile holds labour market returns. Workers with a higher educational degree acquire bigger gig projects in the high-skill online gig economy compared to workers with lower educational degrees. However, the size of these labour market returns is rather modest in terms of explanatory power and when compared to the impact of the rating system on the size of gig projects. In addition, I find a relatively strong transferability of degrees across countries and different institutions in the Global North, especially for general academic education. The degree transferability of vocational education is lower but still present in the high-skill online gig economy.

1.5.5 Conclusion: Do National Institutions prevent a Global Labour Market in the High-Skill Online Gig Economy?

In the final chapter, I synthesise the main findings of the four separate studies to draw conclusions on the overarching research question. I highlight the contributions to three literature branches: digitalisation studies, institutional theory, and labour market sociology. Furthermore, I discuss some critical limitations and highlight avenues for further research taking a socio-economic, institutional perspective on the high-skill online gig economy.

CONCEPTUALISING THE GIG ECONOMY AND ITS REGULATORY PROBLEMS

Abstract

The advent of online platforms has been considered to be one of the most significant economic changes of the last decade, with their emergence reflecting a longer trend of increasing contingent work, labor market flexibility, and outsourcing work to independent contractors. In this article, we conceptualize the so-called gig economy along four dimensions, namely, online intermediation, independent contractors, paid tasks, and personal services. Using this framework, it is possible to derive both a narrow definition of the gig economy, as ex ante specified, paid tasks carried out by independent contractors mediated by online platforms, and broader definitions that include offline alongside online intermediation, employees alongside independent contractors, unpaid tasks alongside paid tasks, and asset sharing alongside performing gigs. The four dimensions also span four key regulatory questions: How should online platforms be classified and regulated; how should gig workers be classified and regulated; what should count as paid and unpaid work; and should we treat earnings from performing gigs differently than earnings from sharing assets? We conclude that the positions taken on these regulatory issues are essentially contingent upon political choices and will determine how the gig economy evolves in the future.

2.1 Introduction

The advent of online platforms has been considered to be one of the most significant economic changes of the last decade (Kenney & Zysman, 2016; van Dijck et al., 2018). In the context of labour markets, online platforms are used to match the supply and demand of flexible labour. The emergence of such platforms reflects a longer trend of increasingly contingent work, labour market flexibility, and outsourcing of work to independent contractors (Estlund, 2018; Hyman, 2018; Stanford, 2017). Online platforms mediating flexible labour are generally classed under the term "gig economy" (De Stefano, 2015; Frenken & Schor, 2017). The best known of these gig economy firms is Uber – the media's "poster boy" for everything deemed good or bad about work via online platforms. However, the rise of online platforms as intermediaries for the supply and demand of flexible labour is by no means limited to the taxi sector. Odd jobs (e.g., TaskRabbit), cleaning (e.g., Helpling), care (e.g., care.com), food delivery (e.g., Deliveroo), and programming and translating (e.g., Upwork) are among the examples of services that are increasingly traded via online platforms.

Even though the amount of labour hired through online platforms is at present still small, there is a shared expectation that it will continue to grow; and it is expected to account for a significant part of the economy in the near future (De Stefano, 2015). Given these expectations, scholars, unions, and policymakers alike have taken a great interest in the phenomenon of the gig economy. In their debates, we have witnessed a proliferation of definitions and claims, which reflects the newness and complexity of the phenomenon at hand. However, the lack of an agreed conceptualisation and analytical framework could hamper the accumulation of academic understanding of the gig economy, as well as the political deliberation processes regarding its regulation.

To offer an analytical framework for the rapidly increasing number of concepts and policy proposals on offer, we identify four dimensions along which the gig economy has been distinguished from other parts of the economy. These dimensions include (i) online platform versus offline intermediation, (ii) independent contractor versus employee status, (iii) paid versus unpaid work, and (iv) provision of services versus goods. Taking the lowest common denominator of these four dimensions as a baseline, one can define the gig economy as the ensemble of ex ante specified, paid tasks carried out by independent contractors mediated by online platforms. Using this framework also allows us to consider a broader definition of the gig economy that includes a wider range of economic activities along each of the four dimensions, namely, intermediation by offline platforms alongside online platforms, employees alongside independent contractors, unpaid tasks alongside paid tasks, and goods rented out in the "sharing economy" alongside tasks carried out in the gig economy.

Our four-dimensional framework not only aims to clarify the fuzzy conceptual boundaries of the gig economy, but it also points to the four essential directions for regulatory responses to societal concerns raised by its advent. Accordingly, the four pillars of our conceptual framework also map onto four substantial regulatory questions related to the

gig economy, namely, (i) whether online platforms mediating the supply and demand for gigs should be regulated differently from offline intermediaries performing the same function, (ii) whether gig providers mediated by online platforms should be regulated differently from employees, (iii) whether paid gigs should be regulated differently from unpaid gigs, and (iv) whether providing gigs should be regulated differently from sharing goods. These regulatory issues are currently at the centre of the debates surrounding the gig economy. Accordingly, we argue that the future development of the gig economy is essentially contingent upon political choices regarding the four regulatory challenges that follow from our framework.

The next section draws on the existing literature to introduce the four dimensions we use to conceptualise the gig economy. We then discuss the regulatory questions that follow from these four dimensions. The final section concludes that the future development of the gig economy will be chiefly determined politically, and that it will depend on the regulatory positions taken on the analytical dimensions we propose.

2.2 Conceptualising the Gig Economy along Four Dimensions

Despite the massive interest in the gig economy, a widely accepted definition is still lacking among academics, policymakers, and practitioners. Some scholars avoid a general definition, instead focusing on a specific platform (Birgillito & Birgillito, 2018; De Groen et al., 2016; Green et al., 2018; Hara et al., 2018) or a specific sector (Cramer & Krueger, 2016). Others refer to the gig economy as "digital labour markets" without further definition (Burtch et al., 2018; De Stefano, 2015; Eichhorts et al., 2017). And, when looking at scholars who provide clear-cut conceptualisations of what they regard as the gig economy, substantial differences remain (Healy et al., 2017; Kuhn & Maleki, 2017; Stewart & Stanford, 2017).

Definitions have immediate empirical implications. As some define the gig economy more narrowly and others more broadly, the size estimates of the gig economy differ substantially. Looking at the Netherlands, as an example, one report estimates the size of the Dutch gig economy as involving 0.4 per cent of the working population (ter Weel et al., 2018), while another estimates it to be 10.6 per cent (Pesole et al., 2018) of the working population.

However, despite little agreement on how the gig economy should be conceptualised, it is possible to distil four dimensions along which definitions of the gig economy diverge between authors. As shown in Figure 2.1, they include (i) online platform versus offline intermediation; (ii) independent contractor versus employee status; (iii) paid versus unpaid work; and (iv) delivery of services versus goods. We elaborate on each of these four dimensions below.
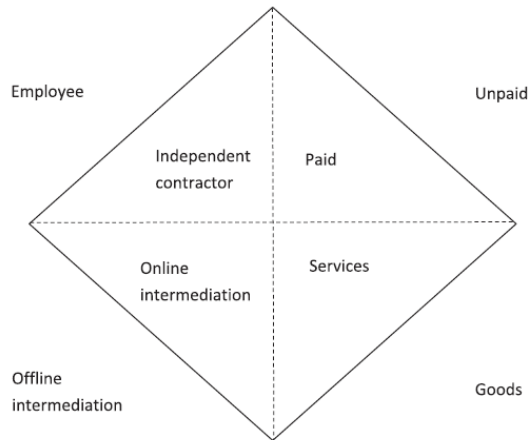
FIGURE 2.1 | Four characteristics of the gig economy, in narrow and broader senses.

2.2.1   Online Platform versus Offline Intermediation

Most scholars see intermediation by online platforms, be it through an app or a website, as a key defining feature of the gig economy (e.g. Aguinis & Lawal, 2013; Stewart & Stanford, 2017; Wood et al., 2019a). In this view, the advent of such online platforms has led to the advent of the gig economy. This view is also shared in the policy reports of individual countries, such as the United States (BLS, 2017), the United Kingdom (BEIS, 2018; CIPD, 2017), Finland (Statistics Finland, 2017), Sweden (SOU, 2017), and the Netherlands (ter Weel et al., 2018), as well as for Europe as a whole (Pesole et al., 2018).

The logic of considering only platform-mediated work as belonging to the gig economy is based on two principal arguments. First, scholars who see online platforms as a defining feature of the gig economy tend to argue that the role of rating systems and algorithmic management fundamentally differentiates online platform intermediation from older forms of offline intermediation (temp agencies, telephone operators, offline bulletin boards, etc.) (De Stefano, 2015; Duggan et al., 2019; Shapiro, 2018; Wood et al., 2019). Second, they see online platforms changing not only the technology used to mediate supply and demand but also the legal nature of relationships, replacing bilateral with trilateral relationships involving a worker, a requester, and the platform (Aloisi, 2015; De Stefano, 2015; Duggan et al., 2020).

Other scholars, however, do not consider online platform intermediation as a defining characteristic when conceptualising the gig economy (G. Friedman, 2014; Kuhn, 2016; Stanford, 2017). Instead, they understand the gig economy as a more encompassing phenomenon that includes all flexible work arrangements of independent contractors, regardless of platform intermediation. Proponents of this broader conceptualisation are often economists, who argue that the platform in itself does not fundamentally change the nature of the gigs that are carried out as ex ante specified, paid tasks (the taxi drive, the cleaning job, the programming task, etc.). The main economic effect of online platform

mediation has been to lower transaction costs in the market for gigs, which does not necessarily mean that gigs mediated by online platforms should be conceptualised as a separate economic activity from those gigs that are not.

2.2.2 Independent Contractor versus Employee

The second dimension on which definitions of the gig economy diverge is the nature of employment. Most studies emphasise that the supply of labour in the gig economy concerns "individuals," "taskers," "freelancers," "self-employed," "independent workers," or "independent contractors" rather than employees (G. Friedman, 2014; Kuhn & Maleki, 2017; Meijerink & Keegan, 2019; Prassl & Risak, 2015). This "freelancing" aspect of the gig economy also entails work being organised into specific tasks upon which gig workers and requesters agree ex ante, that is, before completion of the task. Ex ante defined tasks are typically, but not necessarily, carried out by independent contractors rather than employees. The possibility of carrying out gigs as independent contractors or as employees leads Prassl and Risak (2015) to distinguish between internal and external gig work (or what they call "crowdwork"). In this context, internal work refers to gigs carried out by a company's internal workforce and external work refers to those carried out by workers active on an online platform.

Those who consider only independent contractors to be part of the gig economy ignore the simple empirical fact that some online platforms, like Deliveroo, started off by employing their riders and only switched to using independent contractors later on (Zekić, 2019). Other platforms, such as Hilfr in Denmark, pioneered a hybrid model in 2019 where workers start with independent contractor status but can opt for employee status after 100 hours of work (Aloisi, 2019). And in Germany, platforms for delivery services, such as Lieferando, offer highly flexible employment contracts where riders are paid by the hour (including their waiting time).

A question at the centre of contemporary legal debates is whether gig workers are to be considered independent contractors or employees (Aloisi, 2015; De Stefano, 2015; Prassl, 2018; Prassl & Risak, 2015; Taylor et al., 2017). The legal status of "independent contractor" implies a certain amount of autonomy, which may be questioned in this case. While some platforms only act as a simple bulletin board for gigs, others are more actively involved in the transaction (including matching, contracting, and pricing) as well as the evaluation of a gig (through timing, ratings, and reviews) – which may, in turn, be fed back into the matching algorithm. The control that such platforms exert over workers casts doubt on the autonomy of workers and has, in several court cases, provided legal grounds for a reclassification of independent contractors as employees (De Stefano, 2015; Loffredo & Tufo, 2018; Prassl, 2018).

2.2.3 Paid versus Unpaid

In accounts of the gig economy, most scholars explicitly focus on paid work (De Stefano, 2015; Kuhn & Galloway, 2019; Taylor et al., 2017). Hence, their notion of the gig economy

refers to market transactions only and can thus be measured, for example, through bank transaction data (Farrell et al., 2018; Farrell & Greig, 2016). The focus on paid work is understandable as many investigate whether independent contractors mediated by online platforms should be considered to be employees (for which payment is a necessary condition; Aloisi, 2015; De Stefano, 2015; Healy et al., 2017), while others focus on questions related to financial matters, such as the minimum wage (Stanford, 2017) or tax issues (Thomas, 2017).

However, the focus on paid work as a defining criterion of the gig economy also raises questions. First, there is a substantial component of unpaid work associated with paid work in the gig economy. For example, waiting time for chauffeurs and couriers is not compensated if they have the status of an independent contractor. And, especially on platforms that organise digital services performed remotely (such as data entry, programming, translation, etc.), gig workers spend a lot of unpaid time searching for gigs (Berg, 2016; Wood et al., 2019a). Regarding voluntary work, we also witness the advent of online platforms matching the supply and demand of work. Distinguishing between ordinary, paid work to voluntary, unpaid work in this context is not a straightforward matter. Platforms may frame the work they mediate as voluntary while nevertheless suggesting financial compensation from the requester. And in some instances, such as Helpper in Belgium, the work is advertised with hourly pay rates, albeit ones that are below the minimum wage.

2.2.4 Services versus Goods

The final conceptual issue concerns the question of whether the gig economy only includes individuals performing gigs by selling their own labour, or whether it should also include individuals who rent out their assets. Most authors agree that the gig economy should be restricted to labour transactions so as to differentiate labour platforms from capital platforms – where labour platforms refer to the intermediation of ex ante specified tasks in the gig economy, and capital platforms refer to individuals who rent out their own consumer goods in what is known as the sharing economy (Duggan et al., 2020; Farrell & Greig, 2016; Frenken & Schor, 2017).

However, this seemingly clear-cut conceptual distinction is often not fully applicable because sharing assets also involves some amount of labour (Frenken, van Waes, et al., 2020). For example, the tenant of accommodation rented through Airbnb also pays for reception and cleaning, which can be considered gigs (regardless of whether the homeowner or someone else carries out these tasks). In this sense, renting out an asset to a consumer can also be considered an ex-ante specified task (just like a gig) – albeit a rather capital-intensive one. Following this view, some scholars place labour (gig) platforms and renting (sharing) platforms under the same conceptual umbrella (Healy et al., 2017; Schor, 2016), and some policy reports also include the sharing of assets in their analysis of the gig economy (CIPD, 2017; Pesole et al., 2018).

2.2.5 Narrower and Broader Definitions

The four dimensions we have identified in relation to the gig economy and its conceptualisations span a four-dimensional analytical framework. Following this framework, the lowest common denominator can serve as the narrowest baseline definition of the gig economy, as ex ante specified, paid tasks carried out by independent contractors mediated by online platforms. It also follows from our framework that broader definitions of the gig economy are conceivable, including intermediation by offline platforms alongside online platforms, employees alongside independent contractors, unpaid tasks alongside paid tasks, and goods rented out in the sharing economy alongside tasks carried out in the gig economy.

2.3 Regulatory Classification

Our discussion of the four dimensions of the gig economy makes clear that the concept of the gig economy has fuzzy boundaries. The proliferation of definitions both in academia and in policy documents can thus be understood as a manifestation of the difficulty of drawing sharp boundaries along each of these four dimensions. Our framework, then, is helpful in unravelling the sources of these conceptual divergences.

We can also use this four-dimensional framework to shed light on current debates regarding the institutionalisation of the gig economy. These debates are centred on the distinctions between online platforms and offline intermediation, between independent contractors and employees, between paid and unpaid work, and between services and goods. The exact boundaries between these categories can be drawn differently in different countries and economic sectors. Consequently, just as we witness a plurality of conceptualisations of the gig economy, we also witness a plurality of institutionalisation processes of the gig economy (Thelen, 2018; Uzunca et al., 2018).

More specifically, the four dimensions we have distilled from the conceptual debate surrounding the gig economy constitute an analytical scheme that allows us to systematically reflect on four current debates about regulatory classifications. These issues concern the following questions (i) how an online gig platform should be classified, (ii) how a gig worker should be classified, (iii) how we should deal with paid and unpaid gigs, and (iv) how we should deal with rental services based on personal assets. We will discuss these four regulatory debates one by one, including their interdependencies.

2.3.1 Online Platform versus Offline Intermediation

One of the major differences between online platforms and older forms of intermediation in traditional labour markets consists in the radically new way that intermediation is performed, namely through algorithms, reviews, Global Positioning System, and electronic payment systems. It is the novel way in which online platforms match supply and demand that has raised platform-specific regulatory issues, including algorithmic discrimination, privacy, and the lack of transparency (Helberger et al., 2018; van Dijck

et al., 2018). These concerns lead to a range of new regulatory challenges, not just for gig economy platforms, but also for online platforms more generally (including second-hand marketplaces, search engines, and social media), which are beyond the scope of the current article.

In the context of the gig economy, the key issue at hand is the classification of an online platform. Gig economy platforms generally present themselves as online intermediation services or "technology companies." Under prevailing e-commerce law in Europe and the United States, such platforms cannot be held liable for the actions of their gig workers (except in very specific circumstances) (Cauffman & Smits, 2016; Helberger et al., 2018). This has also been the starting point for the European Commission in its reflections on online labour platforms (Valant, 2016).

However, sectoral regulations may apply to online platforms, to the extent that they perform similar intermediation functions as "offline platforms." No example could better demonstrate this conundrum than the case of Uber and the way it has been regulated on both sides of the Atlantic (Thelen, 2018). Uber's launch in the United States was characterised by an aggressive marketing campaign to rapidly increase its network and legitimise its operations. At that point, Uber was in direct conflict with the established regulatory systems for taxi services in many U.S. cities, which operated on the basis of a fixed number of licenses (medallions). Instead of backing down in response to the regulatory backlash, Uber branded itself as an agent of "positive disruption" in a monopolistic market and used its growing user base as a tool to advocate and promote its business model to policymakers. The success of Uber (and of similar platforms) led many politicians to adopt this narrative, and to develop a whole new regulatory category, branding them as "network transportation companies" (Thelen, 2018). Europe, on the contrary, followed a different regulatory approach, rejecting Uber's claim of "positive disruption" and forcing the company to adapt its model to the existing regulatory framework. Although the process evolved somewhat differently between countries (Pelzer et al., 2019; Thelen, 2018; Uzunca et al., 2018), the common trend across Europe has been that Uber phased out its UberPOP service with unlicensed drivers and moved instead to a license-only model across Europe, accepting on their platform only drivers with a taxi license. This trend was reinforced in December 2017, when the European Court of Justice ruled against Uber by classifying it as a transportation company, which further settled the debate at the European level (Durri, 2019).

The above example is telling with regard to how regulators choose to deal with the platform aspect of the gig economy. While in the case of the United States, the use of the platform was politically considered an innovation, which effectively set Uber (and similar firms) apart from the taxi market, resulting in a new, tailor-made regulatory framework, the very same innovation was classified as a transportation service in Europe. At the heart of this controversy is the question of whether an online platform, as an innovation, creates a new market or whether it rather disrupts an existing one (Prassl, 2018). Advocates of the former view make a case for a kind of "technological exceptionalism" or "digital distinctiveness" of the gig economy, while those supporting the latter view question the true novelty of the online platform. The answer to the question of whether

the gig economy should be regulated separately (as a platform business) or within the existing legal framework (developed for "offline businesses") is not self-evident. As a consequence, the regulatory response is not straightforward but rather contingent upon political choices and local contexts.

2.3.2 Independent Contractor versus Employee

Across Europe, the employment status of gig workers is probably the most central topic in the public debate on the gig economy (Aloisi, 2015; De Stefano, 2015; Florisson & Mandl, 2018). As different employment statuses directly translate into different forms of social protection, working conditions, and representation of workers, the legal term used to describe gig workers in each country has direct effects on their rights and obligations. Furthermore, it has broader implications in the field of competition law and taxation (Risak et al., 2013).

The transformation of the working relationship from bilateral to trilateral inescapably raises the question of whether gig workers should be classified as employees (Prassl & Risak, 2015). Traditionally, work relationships have been bilateral, be it between a requester and an independent contractor or between an employer and an employee. In the case of intermediation by platforms, however, this bilateral relationship develops into a trilateral work agreement between the work requester, the platform, and the gig worker. In the transaction process between the requester and the gig worker, both parties also establish a contract with the platform providing the online services that the two parties use to realise that same transaction. This, in turn, blurs the boundaries between the traditional concept of employee and independent contractor (Duggan et al., 2020; Loffredo & Tufo, 2018; Prassl & Risak, 2015).

The "EU Treaties" (Treaty of the European Union and the Treaty of the Functioning of the European Union) fail to provide a uniform definition of what constitutes a "worker," beyond the scope of the freedom of movement (De Stefano & Aloisi, 2018). Subsequently, the European Court of Justice developed its own definition of the concept of "employee," which is also adopted by the Commission to describe who qualifies as such within the "collaborative economy" (Valant, 2016). According to this definition, an employment relationship exists when "for a certain period of time a person performs a service for and under the direction of another person in return for which he receives remuneration" (Judgment of the Court, 1986, C-66/85, Deborah Lawrie-Blum v. Land Baden-Württemberg).

Importantly, this definition is structured around three main concepts: relationship of subordination, completion of an activity, and remuneration of the activity completed. While gig workers mostly perform activities that are remunerated with monetary payment, the question of subordination is less clear-cut. On the one hand, workers are assessed by clients through ratings and reviews and monitored by platforms for their acceptance rates and speed of service. This information may be used by the platform to decide to ban an "underperforming" gig worker from the platform at any moment and without explanation. On the contrary, gig workers enjoy the freedom of deciding whether, or not, to accept a gig request and remain – in most cases – autonomous with regard to what to charge and

how they carry out the requested gig. Thus, depending on a number of factors (such as the use of ratings in ways that can be detrimental to the gig workers, or whether the price is set by the platform or freely agreed), the gig worker may be classified as an independent contractor or entitled to the legal rights and obligations of a traditional employee (De Stefano & Aloisi, 2018).

A related question that is less often posed in the context of the gig economy is how to classify someone as an independent contractor (Frenken, Vaskelainen, et al., 2020). Importantly, the category of independent contractors is not simply a residual category for those who do not meet the classification criteria of an employee. The question to be answered is whether an independent contractor can exercise the same freedom as an independent business. One constraint imposed by many platforms is that gig workers can hold only one account and receive one assignment at a time, meaning that gig workers are technologically restricted from growing their business by reselling their assignments or hiring employees. The difficulty of classifying a gig worker as an employee or as an independent contractor creates a legal grey area. Here, workers find themselves to be economically dependent on the transacting platform, while not benefitting from the employee status. At the same time, they bear all the risks of being an independent contractor but do not enjoy the same economic freedom as regular businesses (De Moortel & Vanroelen, 2017).

The unclear status of a gig worker leads to a situation whereby it is ultimately up to national courts to decide whether a gig worker performing platform-mediated work is to be understood as an "employee" or "self-employed." As De Stefano & Aloisi (2018, p. 53) point out, in the case of food delivery workers, "a courier performing the same activity can be classified as a quasi-subordinate worker in Italy, as a self-employed worker in France, as an employee in Germany, as a "zero-hours" contract worker in the United Kingdom, or as an intermittent worker in Belgium." Logically, the task of defining who is an independent contractor and who is an employee falls upon the judiciary, which has to apply existing laws to new cases. This may, however, not generate clarity per se, even within a single country, because the same court may reach almost opposite conclusions on different but related cases, as that of Deliveroo in the Netherlands exemplifies (Zekić, 2019). Originally, Deliveroo started out employing its riders but decided in January 2018 not to renew its fixed-term labour contracts and to continue its operations with independent contractors as riders. One of the riders, with the support of the largest Dutch trade union Federatie Nederlandse Vakbeweging (FNV), sued the platform, claiming that there was no fundamental change in the employment relationship between the two parties and that the collective labour agreement of the professional goods transport sector should continue to apply. The Subdistrict Court of Amsterdam ruled against the worker, while nevertheless recognising the shortcomings of current employment law with regard to the gig economy and calling upon legislators to take action. The FNV union then asked the court to rule on Deliveroo's practices as a whole, instead of the individual case. This time, the same Subdistrict Court of Amsterdam ruled in favour of FNV, forcing the company to abandon its model based on independent contractors. The case is still ongoing, as Deliveroo filed an appeal.

Given the regulatory complexity surrounding the classification of gig workers, most stakeholders agree that their work status should be clarified. In essence, this is a regulatory and thus political question, because the classification of gig work – possibly differentiated by sector – has direct consequences for wage setting, social security, and consumer welfare. Four different regulatory solutions have been proposed.

The first solution, mainly advocated by the unions, is to consider gig workers as employees based on the control that a platform exercises over its gig workers (Aloisi, 2015; De Stefano, 2015). Existing laws and regulations would simply continue to apply, and benefits accruing from employee status would ensure the social protection of gig workers. The obvious implication of such a pathway would be that most platforms could not continue to operate their current business models. Instead, they would have to assume the role of employers, requiring the introduction of fixed working hours and pay while workers wait for gigs. It would not imply, however, that the services offered through platforms would cease to exist. Most probably, such services would become more expensive, which would lead the gig economy – including the associated consumer surplus – to shrink in size.

The second way to deal with the legal uncertainty surrounding the classification of gig workers is to introduce a third category alongside employees and independent contractors (Healy et al., 2017; Prassl & Risak, 2017). The aim would be to grant gig workers access to a set of rights that they would not enjoy as an independent contractor. Importantly, though, such an expansion of the legal codex would run counter to the established legal practice of dealing with new phenomena within the scope of existing codices. Furthermore, some scholars argue that a new category of gig workers could result in increased labour-market segmentation and social inequality (Florisson & Mandl, 2018).

Intermediate categories already exist in some EU countries, notably, the "worker category" in the United Kingdom. A well-known case where the intermediate worker category has been extended in order to incorporate gig workers, is Uber BV v. Aslam in London. Two Uber drivers turned against the company, claiming that they were not independent contractors as maintained by Uber's terms of service and should instead be reclassified as "workers" within the scope of the existing labour law, making them eligible for minimum wage, sick leave and paid holiday provisions. As De Stefano and Aloisi (2018, p. 48) explain, the judgment to extend the worker category to Uber drivers showed that the court denied "the fact that the company exercises a mere enabling activity between two opposite groups of users." In doing so, "the British court emphasises that Uber does not provide the opportunity for individually negotiating the content of the obligation, while tasks are performed personally, with no possibility of being replaced temporarily."

One country, France, took the initiative to create a new category in response to the rise of gig economy platforms, thereby extending French employment law to include gig workers (French Labour Law n.2016-1088), so as to bestow on gig workers a set of employee rights. These new provisions apply in all cases where the platform exercises a high degree of control over the worker, as defined by the law. When recognised as

such, the gig worker is entitled to protection from work accidents and work-related disease and enjoys the right to unionisation and collective action (Donini et al., 2017). Regarding other European countries, Risak and Dullinger (2018) mention the "employee-like person" in Austria and Germany, and the "para-subordinate" in Italy as examples of already existing intermediate categories that may be applied to certain gig workers in the future.

Creating a completely new category remains a politically risky endeavour, with the possibility of far-reaching and unintended consequences. If a third category is established, employees may lose rights if their employment status is downgraded to that category (Cherry & Aloisi, 2018). This may explain the reluctance of policymakers to adopt such an approach, especially in contexts where most flexible labour has the same legal status as an employee at a temp agency (for example, in Belgium and the Netherlands).

A third route is to reconceptualise the notion of employer altogether (Prassl, 2015). This approach means moving away from an inelastic definition of the employment relationship, where the following five conditions need to be met in order for a work relationship to qualify as an employer-employee relationship (Prassl & Risak, 2017): the inception and termination of the employment relationship, receiving labour and its fruits, providing work and pay, controlling all factors of production, and undertaking an enterprise with potential profit and loss. A "functional" conceptualisation of the employer, instead, is one "in which the contractual identification of the employer is replaced by an emphasis on the exercise of each function – be it by a single entity (...) or in situations where different functions may be exercised from more than one locus of control" (Prassl & Risak, 2017, p. 281). Following this functional concept of the employer, the latter can be a single entity or combination of entities (e.g., a combination of the requester, the platform, and the gig workers). What matters is who plays a decisive role in the exercise of a particular employing function, and who can then be regulated as such according to prevailing employment law. Hence, a functional approach could be a way to deal with the complexities arising from trilateral work relationships inherent to gig work mediated by platforms.

The incorporation of gig workers into collective labour agreements constitutes a final way of ensuring some degree of gig worker protection. Several unions have taken this up as it reinforces their role as social partners and could increase their membership base (Donini et al., 2017; Johnston & Land-Kazlauskas, 2018; Lenaerts et al., 2018). The most telling example of this fourth approach towards gig worker classification comes from a country with wide union coverage and an institutionalised social dialogue: Denmark. In 2018, the service-sector union 3 F signed a collective agreement with the platform Hilfr, which is active in the care sector. Gig workers can decide to opt-in to become an employee of the platform (enjoying a minimum wage, holiday pay, sick pay, and a contribution to their pension savings) once they have worked for Hilfr for 100 hours, or they can decide to opt-out (Aloisi, 2019). However, collective wage bargaining by gig workers may meet resistance in competition law, given their status as independent contractors in most countries (Daskalova, 2018).

2.3.3 Paid versus Unpaid

Most would agree that the gig economy concerns economic transactions only – thus dealing with paid assignments rather than unpaid assignments associated with voluntary work and hobby activities. There are many examples of platforms that mediate the supply and demand of voluntary work and hobby activities (such as crowdsourcing platforms, open-source software platforms, Wikipedia, or websites of voluntary organisations). One could, however, argue that not all of these are voluntary or hobby activities, as some people work for platforms in the hope that they will be selected for future paid assignments, or that they will otherwise generate revenues, for example, through the publicity they have generated on a platform.

Users of online platforms also leave reviews and comments on a platform's website, which could be regarded as voluntary work to the extent that these users add content with economic value, but without them receiving any financial compensation for it. Taking this argument to its extreme, one could regard any user of a platform as a provider of unpaid work, because any recorded activity on a platform can be used by the platform as information, most notably, for advertising purposes (Fuchs & Sevignani, 2013; Zuboff, 2019). This issue becomes particularly acute once platforms extract economic value from the data that platform workers generate without being compensated for it (van Dijck et al., 2018). This, in turn, leads to the (to date) open political question of whether users ought to be financially compensated for the free "digital labour" they perform while active on online platforms (Savona, 2019).

A related issue concerns the uncertainty of payments. Working without remuneration is illegal in modern legal systems. Nevertheless, there are examples of workers completing assignments for an agreed price but without receiving the actual payment for it, because the requester is free to decide whether, or not, to pay once the assignment is completed. On MTurk, for example, the requester can deem the work submitted to be unsatisfactory and refuse payment, and there is no mechanism for gig workers to challenge this decision. Much more common are questions arising from remuneration below the minimum wage (if one exists), facilitated by the status of independent contractors that platforms assign to gig workers. This practice, if left uncontrolled, could lead to a race-to-the-bottom of labour standards and salaries. This concern is particularly acute in economic downturns (when labour is in abundant supply) and for global platforms mediating online gig work (i.e., gigs that can be performed online), so that gig workers can be hired from around the world (International Labour Organization, 2018). In the absence of supranational regulation and global unions, such global digital marketplaces disempower labour, and may lead to lower wages and decreasing labour security and labour standards alike (Freeman, 2006; Olney, 2013).

The main requesters of online gig work are large firms in Western countries. Hence, a regulatory pathway that may be promising in these contexts is one in which requesters commit to "decent commissioning." For example, IG Metall together with other unions set up a Code of Conduct in 2016, signed by eight internationally operating platforms, which includes a "fair payment" principle following the local wage standards of the

requester. And in 2017, an Ombuds Office was established to enforce the Code of Conduct and resolve disputes between workers and signatory platforms (International Labour Organization, 2018).

The issue of low pay is especially pertinent for those who earn their full income in the gig economy. Schor et al. (2020) find that workers who use platforms only to supplement their income generally feel empowered and pick the best-paid gigs at convenient times, while workers who are dependent on platforms for their full income generally feel disempowered, having to accept low-paid gigs and less convenient working times. One way to counter low pay is to set a minimum tariff for independent contractors, as pioneered by the Netherlands Authority for Consumers and Markets in July 2019 (Autoriteit Consument & Markt, 2019).

2.3.4 Service versus Goods

Scholars generally differentiate the online labour platforms in the gig economy from capital platforms in the sharing economy, where individuals rent out their own consumer goods such as cars and houses (Duggan et al., 2020; Farrell & Greig, 2016; Frenken & Schor, 2017). The distinction between services and goods is important, in that earnings in the gig economy are generally considered as income and taxed accordingly, while earnings in the sharing economy may not be taxed at all (such as occasional second-hand sales, carpooling, and car-sharing), or otherwise tend to fall under specific tax regimes (such as earnings from home rental). One particularly subtle example that illustrates the importance of differentiating between services and goods in the gig economy is the distinction made between ride-hailing (e.g., via Uber) and ridesharing (e.g., via BlaBlaCar). While the former is generally regarded as work, and taxed accordingly as income, earnings from ride-sharing are generally considered to be an untaxed remuneration for the cost of fuel incurred by the car owner, who shares an otherwise under-utilised asset, that is, an empty seat (Frenken & Schor, 2017).

While the difference between labour platforms and capital platforms may be conceptually straightforward, the distinction is less clear-cut in practice. Most tasks that gig workers provide still involve the use of assets required to render the service (such as a computer, car, bike, drilling machine, etc.). Conversely, consumers renting out their assets not only extract rents from this asset but also perform work by cleaning, maintaining, and inspecting the asset upon its return (or hiring labour to this end). Hence, both work and assets are involved as inputs in any service, even if one would intuitively make a distinction between gigs as completing a particular task and sharing as renting out a particular asset. Online platforms, then, can be situated on a continuum, ranging from the mediation of highly labour-intensive gig work (e.g., cleaning and tutoring) to highly asset-intensive sharing services (e.g., home-sharing and car-sharing), with some platforms situated in between (e.g., ride-hailing and home restaurants) (Frenken, van Waes, et al., 2020).

Following this reasoning, the key difference between labour platforms and capital platforms (or gig economy and sharing economy) is not related to whether assets are

involved in providing a particular service, but rather to whether an asset is used by a supplier of a service (in the execution of a task) or by a consumer (who rents an asset for personal consumption). Prices in the gig economy are based on the willingness to pay for a particular service in the form of an ex-ante defined task. By contrast, prices paid in the sharing economy are based on the willingness to pay for the asset being rented out, that is, the services that a consumer can extract from having temporary access to a particular asset as a consumer of that good.

Arguably, the main regulatory challenge relating to the question of sharing versus gig work is of a fiscal nature. Bringing earnings from performing gigs and from sharing assets under the same fiscal umbrella would resolve the classification issue. However, it does not resolve the bigger problem of collecting taxes from earnings in the first place (Oei & Ring, 2017; Thomas, 2017). While taxes from employees are relatively easy to collect because employers can be obliged to disclose their wage payments to the tax office, tax collection from gig workers and sharing consumers is much more difficult. In situations where payments are made via online platforms, current privacy laws make it difficult to oblige platform operators to disclose transaction data, which is especially true if platforms are operated from abroad. And, if taxes can be imposed automatically on transactions made via platforms in the future, those who want to avoid paying taxes may look for alternative platforms that let clients pay gig workers directly.

Interestingly, while the main approach in the United States is to classify gig workers as self-employed and tax them as such, the issue is far less clear in Europe because of the diversity of legal classifications of labour between countries. The European Commission has made it clear that individuals who "carry out independently economic activity [...] through sharing economy platforms" fall within the scope of the Value Added Tax (VAT) directive (Council Directive 2006/ 112/EC) and qualify as taxable persons (European Commission, 2015). Whether a gig worker is classified as an employee or as an independent contractor defines whether they will be considered as a person subject to taxation (Pantazatou, 2018). The issue of independence is thus crucial, as it constitutes the defining element of an activity being subject to tax. If the platform is considered to be just an intermediary, the gig worker is obliged to collect and pay VAT. If the platform is considered to be an employer, the platform is subject to the regulations of the VAT directive, while the gig worker has to pay regular income tax (Pantazatou, 2018).

Much of freelance work has always been informal, implying that workers did not necessarily declare their income at the tax office. With the rise of online platforms, though, the amount of income that remains undeclared may increase substantially. For this reason, Thomas (2017) suggests simplifying tax collection. For example, platform companies could withhold the taxes for their gig workers, but without being classified as employers. As a further simplification, Thomas (2017) suggests a "standard business deduction" for gig workers, which would take away the administrative burden they now face when keeping records and filling in tax forms. Such an approach would also make it possible to introduce different tax rates for gig workers on the one hand and assets sharers on the other. For example, income from gig work is exempted from tax in Belgium

up to 6,000 Euro per year, but income from home-sharing is not (Frenken, van Waes, et al., 2020). This differentiation can be justified for redistributive purposes, assuming that those who own expensive assets, such as houses, planes and boats, are high earners.

2.4 Summary and Conclusions

Hiring workers for single discrete tasks, where the requester and worker are matched via an online platform, is an emerging form of labour transaction – often called the gig economy. Supporters argue that the gig economy meets the wishes of both requesters and workers for more flexible work relationships, while sceptics worry about low pay and limited social security of gig workers. Although the gig economy is receiving widespread attention, consensus on a concept of the gig economy is remarkably limited. Thinking of the gig economy simply as "digital labour markets" sidesteps a more elaborate explication of what the gig economy actually is, which, in turn, complicates empirical assessments of gig work.

In answer to these conceptual and empirical problems, we have proposed a conceptualisation of the gig economy along four dimensions, namely, (i) online platform versus offline intermediation, (ii) independent contractor versus employee status, (iii) paid versus unpaid work, and (iv) service provision versus goods. Taking the lowest common denominator of these four dimensions, one could then define the gig economy, in a narrow sense, as *ex ante specified, paid tasks carried out by independent contractors mediated by online platforms*. Importantly, our analytical framework also makes it possible to take a broader perspective by including offline intermediation, employees performing gigs, unpaid activities, and the sharing of goods in the concept of the gig economy. Furthermore, each of the four dimensions of our analytical framework points to one fundamental issue regarding regulatory classification, namely, (i) how a gig platform should be classified, (ii) how a gig worker should be classified, (iii) how to deal with paid and unpaid gigs, and (iv) how to deal with rental services based on personal assets. In sum, the four-dimensional framework helps us to understand not only the various facets of the gig economy but also the corresponding regulatory challenges.

As well as offering an analytical framework for understanding the conceptual and regulatory debates surrounding the gig economy, our framework can also serve as a basis for future research. It could, for example, be applied to understand the differences in regulatory responses across countries (Thelen, 1999; Uzunca et al., 2018). Online platforms lend themselves well to comparative research designs, as many platforms are active in multiple countries. Similarly, our framework can also be used to study differences in regulatory responses across sectors. Indeed, as the exact functions and operations of platforms differ across sectors, regulatory debates and actions may unfold differently between these sectors (Frenken, van Waes, et al., 2020).

Additionally, the framework can be used to understand the combined effects of regulatory options along each of the four dimensions. For example, classifying a platform

as an employer would imply the classification of the gig worker as an employee, which, in turn, would solve the problem of low pay and foregone tax. Classifying a platform as an electronic service, by contrast, would mean classifying the gig worker as an independent contractor, which would not solve the problem of underpayment unless collective bargaining or minimum tariffs were allowed under current competition law. Classifying online labour platforms as temp agencies would possibly resolve the classification issue for platforms and workers as well. The existing regulatory regime for temp agencies – which still may vary across countries – could then be transposed to platforms (possibly with some adaptations). Platforms would then follow the collective wage agreement with temp agencies and facilitate tax collection by governments, and it would also differentiate gig platforms from asset sharing platforms. However, temp agencies have to comply with regulations that are currently incompatible with the independent contractor model of most online labour platforms, where the workers decide themselves when to work and how to perform a job. Hence, a reclassification of online labour platforms as temp agencies would also require a redesign of the platforms' matching algorithms and associated business models.

Clearly, political choices along each of the four dimensions of the gig economy will have important implications for its future evolution and the ways in which platforms can be deployed to mediate online labour markets. If gig workers become classified as employees and platforms as their employers, adjustments in the platforms' business models will follow, probably raising prices for customers. However, if regulation is more accommodating – so that gig workers keep their status as independent contractors while platforms are considered to be e-commerce entities – the gig economy will most likely continue to grow. Between these two extremes, one can think of applying a functional definition of the employer to be more flexible regarding the grounds on which employer status can be assigned (Prassl, 2015). Alternatively, ad hoc sectoral regulations or collective agreements can be established, depending on a specific assessment of labour conditions, consumer interests, or other relevant public values (Helberger et al., 2018).

Regulation of gig platforms may thus evolve in different directions depending on the national or sectoral contexts (Frenken, van Waes, et al., 2020) – a case-by-case approach that has also been advocated by the European Commission (Valant, 2016). The resulting proliferation of regulatory regimes provides an opportunity to learn across contexts from the variety of regulatory solutions adopted and their economic and social effects. At the same time, the increasing regulatory complexity faced by gig workers, clients, and platforms alike may frustrate the realisation of potential benefits provided by online platforms, and it may also make it harder to agree on social security reforms that would protect independent contractors in a more comprehensive manner, regardless of whether they work via online platforms. In summary, our aim has been to unravel this regulatory complexity along four dimensions, thus providing a multidimensional framework to assess regulatory reforms to come.

3

IS THE ONLINE GIG ECONOMY BEYOND NATIONAL REACH? A EUROPEAN ANALYSIS

Abstract

With the emergence of the online gig economy, computer-based jobs can be completed by gig workers around the world. This raises the question whether the labour market for online gigs is truly boundless as distance no longer matters. Based on gravity models, we investigate the effect of geographical, institutional and cultural distance on almost 30 000 platform hirings between 26 European countries. While we find that online gig platforms are used to off-shore work from high- to low-wage countries, the online gig economy is not boundless as gig workers are still preferably hired from geographically close economies. A common language furthermore facilitates hirings between countries. Interestingly, though, differences in formal and informal institutions hardly affect hiring patterns across countries, suggesting that online platforms create their own institutional framework. We conclude that the online gig economy constitutes neither a boundless nor a frictionless labour market, implying that its promise of creating equal access to job opportunities is exaggerated.

3

3.1 Introduction

Historically, the functioning of labour markets has been shaped by geographical distance and national institutions. Given that workers traditionally completed their tasks at the employers' premises, or at home yet close to their clients, labour markets were essentially local markets. The continued specificity of national institutions within Europe further reinforced the local nature of labour markets. Unlike trade in most goods, the hiring of labour across national borders raises transaction costs substantially, reinforcing the strong localization of labour markets. Iversen and Soskice (2020) even argue that comparative advantages created by national institutions are a major reason why a massive 'race to the bottom' of labour standards has not yet occurred within Europe. Thus, the idea of a 'death of distance' in labour markets, be it in terms of geographical distance or institutional distance, has been considered highly unlikely.

The emergence of the online branch of the gig economy, where digitally transferable services such as writing, editing, translating and programming tasks are transacted via internet-based platforms, holds the promise of a boundless labour market (Graham & Anwar, 2019). In contrast to traditional labour markets, the *gig economy* generally refers to paid, one-time service jobs mediated by platforms and carried out by gig workers, i.e., individuals with the labour status of freelancers. Importantly, two different types of gig jobs can be distinguished, namely onsite and online gigs. In the *onsite gig economy* (De Stefano, 2015), locally bounded services such as food delivery or handicraft services are transacted by platforms like Uber, Helpling or TaskRabbit. The *online gig economy*, on the other hand, consists of labour services that can be transferred digitally (by platforms such as Fiverr, Upwork or PeoplePerHour), like programming or design tasks. Online gig work can thus be completed by workers around the world, thereby eliminating transportation costs. In addition, and in contrast to traditional labour markets, the online gig economy can be accessed without the need to hold a specific kind of 'entry certificate' (such as an educational degree or work permit), suggesting that prior investments are limited, while entry barriers are very low. And given that workers are typically paid per task without any employment arrangement, the impact of national institutional arrangements on the gig economy also seems to be minimalized. In sum, agreement is broad that transaction costs caused by market frictions and institutional dissimilarities are substantially reduced by online platforms (Evans & Schmalensee, 2016; Sundararajan, 2017). Therefore, one might think that the online gig economy constitutes a truly boundless labour market without the common constraints posed by geography and institutions.

Importantly, though, empirical evidence is mixed about whether, or not, the online gig economy indeed constitutes such a boundless labour market where geographical and institutional distance no longer matters. On the one hand, even though freelancers on online gig platforms work from many different countries, wage differences are still noticeable across countries (Beerepoot & Lambregts, 2015; Galperin & Greppi, 2019). In addition, foreign providers are paid less than domestic providers with the same resumé (Lehdonvirta et al., 2014), suggesting that (national) institutional differences might still

be important. On the other hand, Braesemann and colleagues (2022) found that rural workers disproportionately use online labour platforms, indicating that these platforms provide job opportunities to workers that are low in demand on traditional labour markets.

A systematic study of the geographical hiring patterns in the online gig economy is thus equally timely and highly needed in order to better understand the implications of online labour markets for deteriorating wages and labour conditions on the one hand, and for gaining access to additional work opportunities on the other hand. Globalization is perceived as a threat to the protection of national labour forces in European economies with high social security standards. Given that work is subject to the labour law of that country in which work is completed, national governments are 'trapped' between not protecting gig workers, which entails a race-to-the-bottom of labour standards, and protecting gig workers, which hurts their competitive position in the global labour market of the online gig economy (Berg et al., 2018; Mosley & Uno, 2007). In contrast, workers in European countries with limited labour protection may benefit from getting access to online gig work, which is particularly true whenever workers have limited access to work in traditional labour markets due to their disadvantageous geographical location.

To shed light on the extent to which the online gig economy constitutes a labour market where distance no longer matters, we investigate whether wage differences and transaction costs caused by geographical and institutional distance affect the hiring of online gig workers in Europe. More specifically, we examine the claim that the online gig economy enables offshoring labour to lower-wage countries (Lehdonvirta et al., 2019). Furthermore, we consider whether geographical distributions of skills shape hiring patterns on online gig platforms. And we also assess the arguments of the trade literature (Álvarez et al., 2018; De Groot et al., 2004; Serlenga & Shin, 2007) by examining whether increasing transaction costs hamper the existence of an international labour market due to geographical distance and institutional differences.

To shed light on the different drivers of hiring patterns in the online gig economy, we analyse one of the biggest online gig platforms for high-skilled jobs. By employing gravity regression models, we examine the hiring behaviour of 28,539 reviewed transactions conducted by 5,535 gig providers between 26 different European countries. In line with the existing literature (Graham et al., 2017; Lehdonvirta et al., 2019), we show that online gig platforms facilitate offshoring labour to lower-wage countries, even on the European scale. Furthermore, and contrary to common expectations, we also find that geographical distance influences hiring patterns in the gig economy. Similarly, language differences continue to impact transaction costs in the online gig economy (Kuznetsov & Kuznetsova, 2014; Lehdonvirta et al., 2014), despite its international character. In contrast, we find formal institutional distances between countries not to affect hiring patterns in the European online gig economy (Berg & De Stefano, 2018).

The remainder of the paper is organised as follows. Section 2 develops the theoretical framework upon which we draw in order to derive hypotheses about how distance and institutions relate to (transaction) costs, which may influence the hiring behaviour in a

global labour market. Section 3 lays out the empirical and methodological approach that allows for testing these hypotheses. The results of these analyses are presented in Section 4. Section 5 concludes by summarizing and discussing the respective findings.

3.2 Theory

The literature on online gig platforms highlights three main reasons for requesters to hire online gig workers (Beerepoot & Lambregts, 2015; Berg et al., 2021; Cedefop, 2020; Gomez Herrera et al., 2017; Graham et al., 2017), namely (a) lower wages, (b) access to skills and (c) lower administration costs. Importantly, the first is an argument of regime competition, translating into direct cost savings, because workers are typically hired from low-wage countries by requesters in high-wage economies (Graham et al., 2017). Access to skills and lower administration costs, by contrast, are institutional arguments related to limiting uncertainty in the hiring process, translating into indirect, transaction cost savings. Ultimately, both logics can be expressed in terms of 'distance', whereby the latter expresses 'cost differences' from a regime-competition logic, whereas distance means 'uncertainty reduction' from an institutional logic. While some of these factors have already been explored in previous studies (Beerepoot & Lambregts, 2015; Berg et al., 2021; Cedefop, 2020; Lehdonvirta et al., 2014; Stanton & Thomas, 2019), a comprehensive study of the determinants of hiring patterns in the online gig economy is still lacking. We therefore systematically elaborate on distance arguments related to both direct wage costs (in Section 2.1) and different types of transaction costs (in Section 2.2).

3.2.1 Direct Costs

There is broad scholarly agreement that requesters hire gig providers to lower costs (e.g. Bryson, 2018; Graham et al., 2017; Lehdonvirta et al., 2019; Lustig et al., 2020; Sundararajan, 2017; Vallas & Schor, 2020). Most obviously, the online gig economy enables a substantial reduction of labour costs by offering work requesters the possibility to hire gig workers from lower-wage countries. In other words, the online gig economy enables cost reduction through offshoring, because the digitalization of services allows requesters from high-wage countries to move their work to countries with substantially lower wages (Beerepoot & Lambregts, 2015). Although global offshoring to low-wage countries is not new, online gig platforms allow to scale-up offshoring to an unprecedented extent (Lehdonvirta et al., 2019).

Offshoring has been enabled by increased access to telecommunication technology and the increased education levels of gig workers in low-wage countries (Freeman, 2008). Faced with a risk of offshoring to low-wage countries, even highly skilled workers around the globe have therefore become vulnerable to international competition, resulting in a potential downward pressure on incomes – particularly in the Global North (Brown et al., 2016).

By showing that the majority of gig requesters are located in high-wage countries, while the majority of gig workers are located in low-wage countries, previous studies have

provided empirical support for the argument that gig hiring patterns take shape as a function of wage differentials between economies (Graham et al., 2017; Lehdonvirta et al., 2014). Therefore, we expect to find that:

H1: A lower average wage in the gig worker country, compared to the average wage in the requester country, positively influences gig worker hirings.

3.2.2 Transaction Costs

Enabling offshoring practices is not the only way in which online gig platforms reduce costs. Possibly more importantly, online platforms reduce the transaction costs that are associated with hiring gig workers. Contrary to direct costs (including a gig worker's wage costs and the platform's fees), transaction costs are those costs related to market participation (Coase, 1937; Williamson, 1981, 1985). At a theoretical level, scholars distinguish between three different types of transactions costs (Furubotn & Richter, 2010): First, *search and information costs* emerge from those efforts that need to be made in order to find an appropriate good or service, which offers the most opportune quality-price ratio. Second, *bargaining and decision costs* are those costs related to setting up the preferred agreement, including the costs for negotiating and setting up a contract. Third, after contract formation, transaction costs finally include *policing and enforcement costs.* These costs emerge from ensuring that all parties involved follow the rules established in the contract.

In traditional employment, freelancing and even temp agency work, geographical distance has been a key determinant of all three types of transaction costs. First, *search and information costs* increase with geographical distance (McCann, 2008), because both information (Granovetter, 1973) and reputation (Buskens, 2002) generally percolate within social networks. Social networks have largely remained geographically determined as both offline (Mollenhorst et al., 2011; Wellman, 1996) and online networks (Lengyel et al., 2015; Takhteyev et al., 2012) remain spatially proximate. Second, *bargaining* usually makes it necessary for the work requester and applicant to meet in person. If this is not possible, the bargaining phase will be prolonged due to less efficient communication, which additionally increases bargaining costs (Lunnan et al., 2019). Finally, *policing and enforcement costs* are dependent on distance as well. Typically, these costs are reduced by installing a local body, generally a supervisor who oversees the worker, which necessarily becomes more difficult with increasing geographical distance between work requester and provider.

Online gig platforms accredit their success mainly to reducing, or even elevating, these geographically bounded transaction costs (Lehdonvirta et al., 2014). First, online gig platforms lower *search costs* by publicly showing the profiles of gig providers, including their CVs, work portfolios and skill tests. Platforms also provide performance ratings of both gig requesters and providers (Agrawal et al., 2016; Gomez Herrera et al., 2017; Lehdonvirta et al., 2019). In this way, gig requesters can immediately assess the workers' skill types, work portfolios and past performance.

Furthermore, online gig platforms provide both gig requesters and providers with tools to express their *bargaining* position effectively. Gig providers can, for example, indicate their requested hourly wage, while gig requesters can signal their budget available for a specific task. Platforms facilitate this communication digitally, therefore eliminating the need to meet in person.

Finally, the platforms' reputation system also lowers the *enforcement and policing costs*, by facilitating trust between requester and provider. Trust in transactions arises from 'learning', i.e. having information about the past behaviours of the contracting partner, and 'control', namely the possibility to impose sanctions in the case of uncooperative behaviour (Buskens & Raub, 2002). Online review systems facilitate both. Review scores, as well as written reviews, provide an easily interpretable way to 'learn' from previous experiences – even for outsiders who have not been involved in this past experience. In this way, reputation systems facilitate trust between strangers (Cook et al., 2005; Przepiorka, 2013). Furthermore, gig requesters can quite easily 'punish' a provider for calamities through a poor review, thereby exerting substantial 'control'. The mere threat of receiving a poor performance rating and review creates a strong monitoring force (Wood et al., 2019a). What is more, platforms also retain the right to block the account of gig work providers and requesters without prior notice as a policing and enforcement tool of last resort.

While online platforms allow participants to escape geographical constraints, this does *not* imply that geographical distance does not matter in online transactions in the gig economy. First, while the job transaction can be easily completed without face-to-face encounters, the completion of the job itself may involve face-to-face interaction. And even if face-to-face interaction is not foreseen from the outset, parties may ask for such encounters in case questions or disagreements arise, e.g., about how the work is to be completed. Second, transactions via online platform may occur between parties that also trade, or have traded offline in the past. In such cases, the geographical structure of an offline labour market may still be visible in the online labour market. In particular, Lehdonvirta and colleagues (2014) find that gig workers have a higher chance of obtaining a job, and of getting better paid for jobs, by domestic than by foreign requesters. This leads us to hypothesize that geographical distance or, respectively, proximity still matters as it also shapes hiring patterns in the online gig economy:

H2: Geographical proximity positively influences gig worker hirings between countries.

Another reason for why requesters use online gig platforms is that these platforms reduce search costs whenever particular worker skills are needed. Labour platforms offer requesters access to an international labour force characterized by a large variety of skills, while gig workers can offer their services to numerous requesters. The chance of finding a match between supply and demand in such a thick market is therefore much higher than in thin local markets. In economics, such benefits pertaining to both supply and demand of concentrating a market onto a single platform are known as 'two-sided network externalities' (Rochet & Tirole, 2003).

Given that online gig platforms create thick markets with a highly diverse labour force, offering a wide variety of skills, requesters can more easily find those scarce skills in their home markets (Gomez Herrera et al., 2017). Herrmann (2008) shows that firms in traditional labour markets already use international labour markets to hire scarce skills from abroad, thereby bypassing national institutional rigidities. Similarly, skill requesters can use online gig markets to overcome national labour-market constraints and acquire those skills that are under-supplied in traditional labour markets (Lehdonvirta, 2017). In line with this reasoning, we hypothesize that gig requesters use labour platforms to hire workers for skills that are scarce in the requester's home country.

H3: Differences in the skill sets of workforces positively influence gig worker hiring between countries.

National differences in institutions are typically mentioned as a third factor that increases transaction costs in international trade – next to geographical distance and differences in skill supply (e.g. Linders et al., 2005; Walsh, 2006). In international trade, requesters and providers are embedded within different formal (regulatory) and informal (cultural) institutions. In line with historical institutionalism (see Hall & Taylor, 1996; Koelble, 1995; Streeck & Thelen, 2005), we here understand institutions as 'formalised rules that may be enforced by calling upon a third party' (Streeck & Thelen, 2005, p. 10). In other words, they are the agreed upon rules of the game, either written or verbal, which foster a systematic behaviour of the actors involved. Various authors have argued that institutions are among the most important factors that define transaction costs, and can, therefore, impede trade (e.g. Nickell & Layard, 1999; North, 1990) and, accordingly, the hiring of gig workers.

To date, the online gig economy is hardly regulated. However, pre-existing institutions, which developed at the national level outside the gig economy, may still influence the online gig economy by shaping the behaviour of national workforces and work requesters on gig platforms. For the offline economy, economic geographers repeatedly showed that similar institutions decrease transaction costs (e.g. Beugelsdijk et al., 2004; De Groot et al., 2004; Linders et al., 2005). The reasons are twofold and both applicable to the online gig economy. First, similar institutions prevent major adjustment costs, stemming from an unfamiliarity with the rules and habits of the trading partner's economy, and from the insecurity related to transaction contingencies (De Groot et al., 2004, p. 111). Second, actors from the same institutional background tend to share similar behavioural norms (Beugelsdijk et al., 2004). This, in turn, makes communication easier, faster, and hence less costly.

In line with these arguments, empirical studies have extensively shown that domestic trade is preferred over foreign trade (Jošić & Jošić, 2016; Olayele, 2019; Wolf, 2000). Crossing borders typically implies increasing costs, especially transaction costs associated with higher administrative costs and higher uncertainty levels about contractual compliance. The socio-economic literature widely refers to this preference of domestic over foreign trade as the 'border effect' (J. E. Anderson & van Wincoop, 2003; Olayele, 2019), 'liability of foreignness' (Hymer, 1976; Lehdonvirta et al., 2014; Zaheer, 1995), or as the term we will

use here: 'home country bias' (Jošić & Jošić, 2016; Wolf, 2000). This leads us to propose a fourth hypothesis:

H4: National boundaries negatively influence the hiring of gig workers.

While national boundaries constitute a pars-pro-toto indicator of institutional homogeneity within and, respectively, heterogeneity between countries, a wide variety of institutions also exist within countries. Out of these, what kind of differences in specific institutions are particularly likely to influence hiring patterns in the online gig economy? The socio-economic literature makes a distinction between formal institutions, related to law formation and legal enforcement, and informal institutions, related to social norms and common practices (e.g. Bilgin et al., 2017; Hall & Soskice, 2001; Linders et al., 2005). From this literature, we also know that both types of institutions can affect trade if they differ between countries. Accordingly, they are likely to influence hiring patterns in the online gig economy as well.

The literature on formal institutions shows that their *quality*, i.e., their effectiveness (such as the time it takes to obtain a judgement whatever the legal approach pursued), is of particular importance. A better quality of the institutional framework reduces uncertainty about contract enforcement and general economic governance (De Groot et al., 2004). Various economic geographers found that institutions of poor quality entail negative externalities and, thus, reduce international trade (e.g. J. E. Anderson & Marcouiller, 2002; Linders et al., 2005; Wei, 2000). In addition, both De Groot et al. (2004) and Linders et al. (2005) found that differences in institutional quality reduce bilateral trade in the traditional economy. The reason, simply, is that institutional quality affects expectations of both parties, e.g., regarding how strictly contracts will be enforced. Different kinds of institutional quality thus entail a difference in expectations between labour requester and worker. Different expectations increase uncertainty, hence increase costs, which discourages hirings. Applying this argument to the online gig economy, our second hypothesis on formal institutional differences is that:

H5: Similar degrees of the quality of regulatory institutions positively influence gig worker hiring between countries.

Apart from formal institutions which emanate from rules and regulations that can be directly influenced by the state, we expect informal institutional differences to play a role as well. This is particularly so, as many tasks transacted via online gig platforms have a strong cultural component drawing on symbolic knowledge, such as writing, translation and design tasks. One way of conceptualizing informal institutions is by means of national cultures. Since culture has been understood as 'a population's shared habits and traditions, learned belief and customs, attitudes, norms, and values' (White & Tadesse, 2008, p. 1079), cultural proximity between countries is accordingly based on a broader, societally shared understanding of how things are and ought to be. Cultural distance thus raises transaction costs of international trade whenever significant cultural differences make it difficult to understand, control and predict the behaviour of others. Accordingly, numerous studies have demonstrated that greater cultural distance

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hampers trade (e.g. Cyrus, 2012; De Groot et al., 2004). Applied to the cross-border hiring of gig workers, for example, different perceptions of the hierarchy in the relationship between worker and requester might hinder, while similar cross-country values may facilitate cross-border hirings (Kristjánsdóttir et al., 2017). We take this literature strand into account by proposing the following hypothesis:

H6: Cultural distance negatively influences gig worker hirings between countries.

Finally, in addition to culture, language also plays a role in international trade. Various authors (e.g. Chiswick & Miller, 2005; Felbermayr & Toubal, 2010; Hutchinson, 2005) show that transaction costs increase whenever both parties involved in a transaction have different mother tongues because the gathering of information is hampered, while bargaining becomes more difficult (Melitz & Toubal, 2014). With a shared mother tongue, expressions, subtleties and culturally dependent interpretations are passed on easily. But these cues are not (equally) understood whenever the transacting parties have different mother tongues. While the language used on most online gig economy platforms, and the Internet in general, is English, providers and requesters with the same mother tongue can use an additional – namely their most familiar – language to communicate. Gig providers and requesters who do not share the same mother tongue are lacking this additional vehicle of communication which, in turn, decreases communication efficiency (Melitz & Toubal, 2014). This leads us to expect that:

H7: The same official language positively influences gig worker hirings between countries.

3.3 Methodology

3.3.1 Data: Sampling Approach

To test the above hypotheses, we used gravity models which compare the amount of (in our case hiring) flows between countries. To run our gravity models, we applied (aggregate) information at the country level in order to obtain a dataset where each case constitutes a country-by-country comparison of hiring flows (dependent variable) and their determinants (independent variables). To obtain such a dataset, we collected information on the gig provider profiles available on one of the largest platforms worldwide for high-skilled, online gig tasks, such as programming, design, translations and writing. Importantly, the platform we examined poses hardly any algorithmic control over the matching process that would bias our results. Both requesters and providers can initiate a transaction – providers by advertising their skills and applying for posted jobs; and requesters by posting a job and/or sending a personal message to specific gig providers. Gig requesters are also not restricted with regard to the size of, and wage/price for, the gig jobs they want to offer; nor does the platform use geographical location to constrain the matching process without explicit request by the gig requester.

Our reasons to choose this platform were threefold. First, it is amongst the largest platforms for online, high-skilled gig jobs in the online gig economy, which increases the external validity of our results as it allows generalizations to the high-skill, online gig economy as a whole. Second, the platform provides the necessary information on the work history of gig providers. More concretely, this platform is one of the few that publicly provides the work history (as far as it has been reviewed) as part of the gig providers' profiles. Third, the platform in question imposes little control on the matching process. Actors need to agree to the terms and conditions in order to get access to the platform. These terms and conditions refer, inter alia, to conflict resolution procedures and property right statements. However, once access has been granted by the platform, workers can set their wages independently, while gig requesters can choose freely which worker to hire. Workers are notified as soon as a job application is posted that requires at least one of the skills included in their respective profiles. It is then up to the gig workers to apply, or not. Yet, irrespective of whether, or not, a gig worker applies for a job, gig requesters can contact gig workers and, if they receive a positive response, hire them. With regard to worker selection, requesters see all applicants for a gig job in historical order, i.e., in the order in which the respective gig workers have applied for the job in question. In this way, our results are largely unbiased with regard to the platform's algorithmic control of prices and trade volume.

We focused our analyses on the hiring flows of gig providers between the following 26 European countries: Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, The Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland and The United Kingdom. We confined our country selection to European countries that are part of the Schengen area, the UK and Ireland. By focusing on European countries, we provide a conservative setting to examine whether distance still matters. Given the freedom of movement, the rather small differences in terms of institutional quality, and the limited differences in time zones, one would expect distance to be least important. Hence, if we still find geographical and institutional distance to matter, we can expect that they matter even more strongly when examining trade outside Europe.

Since gig profiles can rapidly change over time, it was essential to collect the necessary data within a short timeframe. We, therefore, collected the publicly available profiles of gig providers with the use of a scraping algorithm between December 16 and 22, 2019. While the data was collected in the course of 1 week, the original dataset covered a time span of 18 years of reviewed transactions. To account for countries being early adopters of the online gig economy, we selected reviewed transactions conducted in the last 5 years, i.e., completed after December 2014.

By collecting a limited amount of the platform's overall data, in line with our research requirements, we ensured that data collection was in line with the platform's intellectual property rights. By pseudonymizing the data collected, we complied with the necessary legal requirements. Our data collection process was approved by the ethics review board (ERB) of our university. In line with our ERB application, we

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revealed the platform's name to the paper's reviewers but shall not make it public in order to additionally honour data anonymity.

To establish the hiring flows between economies, we needed to focus on those gig providers whose jobs had been reviewed by the gig requester. This is essential in order to be able and trace the country from, and to, which a worker was hired. Importantly, 94.4% of all jobs in our sample completed by gig providers were reviewed so that our focus on reviewed transactions is highly unlikely to generate a sample bias. After removing all gig provider profiles that never completed a gig job for which they obtained a review, the aforementioned sampling approach led to a dataset containing 5,535 gig provider profiles in the 26 aforementioned European economies.

3.3.2 Operationalisation

We used two dependent variables in this study to determine hirings in the online gig economy. Our first dependent variable indicates the ***number of gig hires between two countries*** – for all pairs of countries included in the dataset. We calculated the respective hiring amount based on each gig provider's work history. For each hire, we collected information on the gig requester's country of residence to determine between which two countries the transaction took place. In line with our country sample, we then selected those hiring transactions that occurred between the 26 European countries examined in this study. We counted the number of transactions that occurred between 2014 and 2019. This led to 28,539 hiring transactions over the 5-year timeframe. Second, we used the payment amounts related to these transactions in order to determine the ***total money flow between two countries***. This resulted in a variable ranging from 0 to 691,495 USD.

As first independent variable, we measured ***wage differences*** by examining the profiles of gig workers in our dataset. On this profile, every gig worker indicates the hourly wage (in USD) for which s/he can be hired (although this hourly rate can deviate from the actual wage for which a gig worker is hired). The difference in hourly wages between countries indicates differences in the labour compensation requested and is used as a proxy for wage differences between countries. To compute the difference between countries, we subtracted the average wage in the provider's country from the average wage in the gig requester's country. Accordingly, the variable obtained indicates the average wage 'gain' or 'losses for the requester when hiring workers from any other country. The difference in average wages varies between 0 (for the intra-country dyads) to 24. Our variable accordingly ranges from −24 to 24.

To operationalize our second independent variable of interest, ***geographical distance***, we followed numerous studies (Gopinath & Echeverria, 2004; Montenegro & Soto, 1996; Montobbio & Sterzi, 2013; Porojan, 2001) by taking the geographical distance between the capital cities of the respective countries as an indicator. We extracted this indicator from the GeoDist database[1]. The GeoDist database is among the most used databases

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1   We also used two alternative variables to measure geographical distance, namely the geographical distance between the biggest agglomerations in a country, derived from the GeoDist dataset, and a dummy indicating whether the countries share a border (contiguity). Importantly, the use of these alternative distance measure did not significantly change the results obtained, thereby corroborating their robustness (see Appendix Table A2 and A3).

within economic geography, especially appropriate for gravity models because it offers fine-grained geographical indicators for country-by-country dyads for overall 250 countries worldwide. The geographical distance indicator measures the latitude (φ) and longitude (λ) of capital cities and then calculates their difference based on the great circle formula.[2] Importantly, the indicator also makes it possible to assess intra-country (hiring) flows and, consequently, provides within-country distances.[3]

We measure differences in gig worker skills in two different ways. First, we follow (Bol & Van de Werfhorst, 2013b), who measure differences in national education systems across multiple dimensions. One of these dimensions indicates the **level of vocational orientation** of a country's education system. This dimension is strongly correlated with the types of skills that workers possess, indicating that countries with a strong vocational education system bring out workers with specific skills, whereas education systems with a weak vocational orientation provide workers with general skills. Following this methodology, we employed OECD data collected in 2018 to measure the percentage of upper secondary education with vocational enrolment (OECD, 2018). We then calculated the absolute difference in vocational orientation between countries, which resulted in a variable ranging from 0 to 40. Second, we measure another kind of skill difference by looking at the **percentage of STEM graduates**. To this end, we used UNESCO data on the percentage of STEM graduates in a country. We took the data for 2018, except for Slovenia (where the most recent data was collected in 2017) and the United Kingdom (collected in 2016). We then subtracted the percentage of STEM graduates in the provider's country from the percentage of STEM graduates in the gig requester's country.

The first institutional proximity variable employed is the aforementioned **home country bias**. It is measured by a dummy that distinguishes between inter- and intra-country trade flows. This variable assumes the value '1' when the requester and gig worker reside in the same country, and the value '0' when they do not. To gauge the impact of formal institutions, we examine the role of differences in **institutional quality**. We follow related studies (Álvarez et al., 2018; Beugelsdijk et al., 2004; Linders et al., 2005) by employing the Kaufmann indicators of institutional quality from 2019, presented in the World Bank's '*Worldwide Governance Indicators*' database (Kaufmann et al., 2011). More precisely, Kaufmann and colleagues use six dimensions of institutional quality: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law and control of corruption – of which we took the Euclidean distance to calculate the difference in institutional quality of all country pairs.

To operationalize **cultural differences**, we follow Tabellini (2010), and Tadesse and White (2010) in that culture can be measured as the sum of trust, respect, control and obedience. Using the European Value Study, we employed the same questions as Cyrus (2012) where further methodological elaboration can be found. We used the data collected in 2017 – with the exception of Belgium, Greece, Ireland, Latvia, Luxembourg and Poland,

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2   $d_{ij} = \mathrm{r} * cos^{-1}(sin\,\phi_i * sin\,\phi_j + cos\,\phi_i * cos\,\phi_j * cos\,\Delta\lambda_{ij})$.

3   In line with the standard economic-geography approach, within-country distances are calculated by using the following formula: $d_{ii} = .67\sqrt{area / \pi}$. (see Head & Mayer (2010) for details).

where we used the 2008 data wave. However, combining the four indicators could create similar composite values for countries that arrive at that score very differently. Therefore, we took a more fine-grained approach to cultural differences by examining the four indicators separately in our models. We computed the average value per country for all four attributes and took the counties' absolute differences.

As an additional operationalization of informal institutional differences, we examined whether two countries share a **common official language**.[4] We build a dummy variable that indicates whether (1), or not (0), a common official language is spoken. This variable was extracted from the GeoDist Dataset.

In gravity models, it is necessary to control for the '**mass**' of a country in order to test whether different distances are additional explanations for the differences in the size of trade, on top of the sheer size (or mass) differences between two economies. Most gravity models estimate the mass of a country by either using a country's GDP (Baier & Bergstrand, 2009; Gopinath & Echeverria, 2004; Wei, 1996) or its population size (Carrère, 2006; Gopinath & Echeverria, 2004; Porojan, 2001) as a proxy. While this approach is plausible when the entire country's economy is examined, these mass indicators are less useful for our study, because they do not reflect the respective size of a country's online gig economy. To use a meaningful proxy, we determined, and control for, the size of a country's gig economy based on our own dataset by calculating the total number of gig hires from, and to, a country.[5] This results in two mass variables as controls: For example, to explain the number of Dutch workers hired by requesters from the UK, we control for (a) the total number of jobs for which Dutch workers were hired, as well as (b) the total number of jobs requested by UK residents.

Furthermore, we include employment protection and social dialogue as two control variables, because it could be possible that formal institutions related to dependent employment influence freelancing gig work. For example, gig requesters might be afraid of potential lawsuits when hiring gig workers from countries with more stringent employment protection or high social dialogue effectiveness. To control for the impact of dependent-employment institutions, we measure differences in **employment protection** between countries, by following the institutional literature (e.g. Dilli et al., 2018; Hope & Martelli, 2019; Schneider & Paunescu, 2012; Witt & Jackson, 2016) in using the OECD's '**indicator of regular employment protection legislation**'.[6] This indicator includes the conditions for terminating employment, the involvement of third parties (such as works councils), the length of notice periods to be respected, severance pay, conditions required for laying off employees, repercussions of unfair dismissals and provisions for collective dismissals. The indicator combines this information into one single numeric value ranging from 0 (no employment protection) to 6 (highly stringent

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4 As robustness check, we employed an alternative measurement indicating whether there is a common language spoken by at least 9% of the population of both countries. The regression results are presented in Appendix Table A4.

5   In addition, we analysed our models using an alternative mass variable, namely the number of gig providers and requesters from our dataset. The results are presented in Appendix Table A5.

6   https://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection.htm

employment protection), thereby measuring the strictness of employment regulation. Based on this indicator, we subtracted – for each country pair – the employment protection of the Freelancer's country from the employment protection of the requester's country. For all countries covered in our dataset, we used the most recent data available, namely from 2013 – except for Slovenia and the United Kingdom (where the most recent data is from 2014), as well as for Lithuania and Croatia (with the most recent data from 2015). Given that institutional change is a slow, gradual process (Mahoney & Thelen, 2009; Thelen, 2009), the results obtained are hardly biased by possible differences between years. For **social dialogue effectiveness**, we used the IPD database (Gracia & Nedjam, 2018), which includes perception data on 127 indicators of institutional characteristics for countries and has been widely used in institutional economics (Bénassy-Quéré et al., 2007; Punt et al., 2021). This variable ranges from 0, indicating very little social dialogue at the national level, to 1, indicating a highly effective national social dialogue. We again subtracted the Freelancer's country value from the requester's country value. For further elaboration on data collection of the IPD database, we refer to Gracia and Nedjam (2018). Table 3.1 provides an overview of the descriptive statistics of the respective dependent and independent variables for all country-by-country dyads used in the main results of our study.

3.3.3 Analyses: Gravity Models

To identify the importance of distance in online labour markets, we use gravity models. Gravity models were first applied to social science research by Tinbergen (1962), who used an analogue model to Newton's Law of Universal Gravitation in order to explain trade flows between countries. In short, the model relates the force of attraction – the amount of reviewed gig hirings – between two objects or, respectively, countries to the size of both the countries and the distance between them. Therefore, the basic gravity equation is:

$$I_{IJ} = a_1 \frac{\text{MASS}_i^{a_2} \text{MASS}_j^{a_3}}{Distance_{ij}^{-a_4}}$$

Where in Tinbergen's model I_{IJ} describes the amount of trade between two countries, various scholars have adopted the model to study other country-by-country flows, including migration flows (Karemera et al., 2000) and scientific collaborations (Hoekman et al., 2010). Accordingly, scholars have used gravity models to assess the impact of these country-by-country attributes by considering their distances or similarities. This means that gravity models do not assess whether, for example, employment protection in a country has an effect on that country's trade flows; instead, gravity models examine whether differences in employment protection between countries (i.e., between all country pairs) have an effect on the trade flows between all countries (i.e., between all country pairs).

TABLE 3.1 | Descriptive statistics (N=676).

Dependent variable	Range	Mean	SD
Reviewed transactions	0 – 3,390	42.22	183.97
Total money flow	0 – 691,495	8,794.20	41,774.54
Individual variables			
Wage difference	-24 – 24	0.00	7.45
Vocational education difference	0 – 3.8	2.49	1.03
Difference STEM graduates	-18 – 18	0.00	6.00
Geographical distance	19 – 4167	1319.70	786.23
Home country bias (same country=1)	0 / 1	0.04	-
Difference institutional quality	0 – 2	0.58	0.37
Cultural distance: Trust	0 – 61	20.48	16.25
Cultural distance: Respect	0 – 41	12.32	9.33
Cultural distance: Control	0 – 17	4.63	3.65
Cultural distance: Obedience	0 – 51	12.13	10.32
Common official language (yes=1)	0 / 1	0.09	-
Control variables			
Reviewed transactions inflow	5 – 6,364	1,097.70	1,491.58
Reviewed transactions outflow	83 – 7,721	1,098.00	1,608.09
Money flow inflow	240 – 1,207,069	228,622.30	304,450.10
Money flow outflow	19,935 – 1,579,003	228,622.00	340,413.00
Difference employment protection	-3 – 3	0.00	0.68
Difference Effective Social Dialogue	-3 – 3	0.00	1.36

By log-transforming the variables at both sides of the equation, we arrived at the following linear formula underlying the models we test:

$$\ln I_{IJ} = \ln a_1 + \ln a_2 Mass_i + \ln a_3 Mass_j + \ln a_4 Distance_{ij} + \varepsilon$$

Since our first dependent variable in this study represents the number of hirings between two countries, we analyse this variable by using General Linear Models that are most appropriate for count data. The conditional variance of the number of hirings is larger than the conditional mean (over-dispersion), whereby Theta is significantly different from 1, which implies that negative binomial regression models are most appropriate. For the total money flow between countries, we log-transformed the dependent variable and used OLS regression models. Also, all continuous independent variables were log-transformed, which is both most appropriate and the standard-approach for gravity models. If the range of a variable included negative values, the minimum value plus one was added to the variable before the logarithm was calculated, because a logarithmic transformation can only be performed on positive values. We reported odds ratios for the models for each of the two dependent variables. Standard errors were clustered at the level of country-by-country dyads. We also probed into possible multicollinearity problems by calculating the VIF scores of all independent variables. As shown in the Appendix Table A1, no multicollinearity problems were detected. All hypotheses were tested two-sided.

3.4 Results

Table 3.2 shows the regression results obtained for the number of transactions on the one hand and total money flows on the other. The first noticeable result is that a positive difference in average wage has a significant positive effect on trade between countries, both for the number of transactions and the total money flow (Transactions: OR = 1.384, SE = 0.085, $P < 0.001$; Money flow: OR = 1.639, SE = 0.240, $P < 0.050$). This indicates that, even within Europe, online gig platforms are typically used to hire workers from lower-wage countries – which, in turn, confirms Hypothesis 1.

Interestingly, geographical distance has a strongly significant negative effect, both on the number of gig transactions between two countries (OR = 0.766, SE = 0.043, $P < 0.001$) and on the total money flow (OR = 0.713, SE = 0.122, $P < 0.010$). Both coefficients (of about 0.7 points) are surprisingly similar to those of other studies using gravity models in order to examine service trade in various parts of the world (J. E. Anderson et al., 2014; Kimura & Lee, 2006; Walsh, 2006). Therefore, and contrary to the general opinion that the online gig economy constitutes a truly boundless labour market, we find support for Hypothesis 2.

Furthermore, Table 3.2 shows, contrary to our expectations, that the difference in vocational education systems between countries does not have a significant effect on bilateral trade (Transactions: OR = 0.998, SE = 0.028, $P = 0.957$; Money flow: OR = 1.071, SE = 0.074, $P = 0.814$). Roughly the same can be said for the relation between difference in STEM graduates and gig worker hirings. While the between-country differences in the percentage of STEM graduates have a significant positive effect on the number of transactions (OR = 1.111, SE = 0.051, $P < 0.050$), the effect is not significant for total money flows, where the direction is even the opposite to the one predicted (OR = 0.965, SE = 0.144, $P = 0.804$). Taken together, these results are inconsistent and do not support Hypothesis 3 that countries with national education systems that endow their workforces with different skill profiles trade more on online gig platforms.

With regard to institutional distance, the first noticeable result is a strong home country bias in both models reported in Table 3.2. Online gig workers from the same country are hired about two and a half times as frequently in terms of the number of gig hirings (Transactions: OR = 2.744, SE = 0.217, $P < 0.001$) and three times in terms of the volume of gig work transacted compared to workers abroad (Money flow: OR = 3.317, SE = 0.525, $P < 0.050$). This supports Hypothesis 4 that gig hirings are less likely across national boundaries than within countries.

When examining differences in institutional quality, we do not find any effect on hiring patterns in the online gig economy. Bigger differences in institutional quality did not hamper the number of gig hirings (OR = 1.003, SE = 0.161, $P = 0.987$) nor the total money flow (OR = 0.792, SE = 0.415, $P = 0.574$). We therefore reject Hypothesis 5.

When examining informal institutional differences, the results on cultural differences do not support our hypotheses: None of the indicators of cultural difference (including differences in trust, respect, control and obedience) has a statistically significant effect

on gig hirings, when measured both as the number of hirings and as total money flows. Hypothesis 6 is therefore rejected.

Interestingly, we did find an effect of language. Countries with a common official language are characterized by 1.6 times as many cross-country hirings as would be expected if gig trade was random (Transactions: OR = 1.583, SE = 0.130, $P < 0.001$). When examining the total money flow, the size of the effect remains the same but loses its statistical significance (Money flow: OR = 1.672, SE = 0.315, $P = 0.104$). This indicates that a common official language is especially important for smaller gig projects. These results thus show mixed support for Hypothesis 7.

TABLE 3.2 | Regression models prediction the number of hiring transactions (negative binomial) and total money flow (linear regression) between two countries (directed).

	Transactions		Money flow	
	OR	SE	OR	SE
Wage Difference (Ln)	1.384***	(0.085)	1.639*	(0.240)
Geographical Distance (Ln)	0.766***	(0.043)	0.713**	(0.122)
Vocational Education Difference (Ln)	0.998	(0.028)	1.017	(0.074)
Difference STEM graduates (Ln)	1.111*	(0.051)	0.965	(0.144)
Home Country Bias	2.744***	(0.217)	3.317*	(0.525)
Difference Institutional Quality (Ln)	1.003	(0.161)	0.792	(0.415)
Difference Trust (Ln)	1.049	(0.030)	1.069	(0.085)
Difference Respect (Ln)	1.018	(0.031)	1.032	(0.081)
Difference Control (Ln)	0.940	(0.043)	0.940	(0.113)
Difference Obedience (Ln)	0.970	(0.032)	0.958	(0.079)
Common Language	1.583***	(0.130)	1.672	(0.315)
Mass Freelancer Country (Ln)	2.345***	(0.019)	2.904***	(0.037)
Mass Requester Country (Ln)	2.337***	(0.021)	3.231***	(0.052)
Employment Protection Difference (Ln)	0.941	(0.095)	0.794	(0.260)
Difference National Social Dialogue (Ln)	1.183*	(0.075)	1.684*	(0.216)
Intercept	0.000***	(0.519)	0.000***	(1.470)
Adjusted R2	0.279		0.706	
Theta	5.270***			
2 X Log Likelihood	-4177.197			
AIC	4211.2			

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

3.5 Discussion and Conclusions

While most traditional labour markets are highly localized, the unrestricted international access to gig platforms implies the expectation that the online gig economy elevates geographical and institutional restrictions. To understand whether, or not, this is the case, our study asks whether the online gig economy is indeed a boundless labour market, fostering a level playing field, because limitations due to geographical distance no longer exist while transnational institutions are created beyond the reach of national governance. We answer this question by conducting gravity-model analyses of 26

European countries, examining whether geographical and institutional distance between gig requesters and providers affects the probability of getting hired for a gig job.

Most notably, our results show that the online gig economy does *not* constitute a labour market without boundaries, where geographical and institutional distance no longer matters. Accordingly, we find that geographical distance is a vital factor in shaping hiring patterns in online labour markets. Surprisingly, the importance of geographical proximity in the online gig economy is of a similar size to the effect known for the service sector on offline labour markets. In addition, in line with Lehdonvirta and colleagues (2014), we find that the hiring of domestic gig workers is preferred over foreign gig-worker hirings, indicating a strong 'home country bias'. This means that geographical proximity continues to shape hiring patterns even in the international labour market created by online gig platforms. Our findings also point to important follow-up research, in particular to the question what underlies the continued importance of geographical proximity and domestic hirings: This asks for an empirical analysis of the motivations, considerations and expectations of gig workers and work requesters to enter into transactions.

These findings point to, at least, four mechanisms that ought to be examined in future research. First, it could be possible that – hitherto underexplored – information asymmetries entail additional transaction costs, such as a limited understanding of the education trajectories pursued by gig workers of other countries. Second, in line with Lehdonvirta and colleagues (2019), discriminatory tendencies (of a statistical or taste-based nature) could impede geographically independent gig trade. Third, to obtain gig jobs, gig workers may need to be embedded within localized social networks that facilitate trust (Shevchuk & Strebkov, 2018; Wood et al., 2019b) even in the globally accessible online gig economy. Finally, it could be that the mere possibility of meeting in person affects the matching process between gig requesters and gig providers in a digital labour market.

Our results furthermore show that, even when limiting our analyses to European countries, the online gig economy facilitates offshoring labour to lower-wage countries. In line with Beerepoot and Lambregts (2015), our results confirm that requesters use online gig platforms to acquire cheaper labour. Interestingly, though, we find that differences in worker skills between countries do not influence cross-country hirings. This result may reflect that gig work is accessible without formal educational credentials, such as high-school or university diploma, on which our skill indicator is based to determine skill difference between economies. In line with a previous study (Herrmann et al., 2019), this suggests that educational credentials of gig workers may not influence their labour market success. Furthermore, because of the 'unbundling' of gig skills away from traditional occupational profiles (Gomez Herrera et al., 2017), those skills (and, hence, skill differences between economies) that are essential for being hired by a gig requester, are not easy to measure with traditional skill indicators. Accordingly, our research also contributes to the rapidly growing research strand investigating the role of skills and degrees in the online gig economy (Anwar & Graham, 2021; Braesemann et al., 2021; Herrmann et al., 2019).

Furthermore, we find evidence for the claim that online gig platforms reduce transaction costs by streamlining differences in regulatory structures between countries, which therefore have little influence on hiring patterns in the online gig economy. Online gig platforms thereby successfully bypass existing national institutions: They remove the transaction costs caused by incompatibilities between those national institutions that hampered cross-border labour markets in the past. Where previous studies show national regulation to have little influence on the online gig economy (Berg & De Stefano, 2018), our study adds that *discrepancies between* institutions also do not influence hiring patterns in the digital labour markets. The results suggest that online gig platforms create their own institutional infrastructure via the platforms' terms and conditions to which users of online gig platforms need to conform. These terms and conditions impose their own rules, for example, on conflict resolution and payment conditions (Frenken & Fuenfschilling, 2020). In this way, platforms act as 'private regulators' that create their own institutional environment (Grabher & van Tuijl, 2020) – particularly for those activities that are otherwise not strongly bound by national institutions.

Yet, we also find that online gig platforms are not able to bypass all national institutions. When examining informal institutions, we find that gig providers are more frequently hired by gig requesters from countries with a similar official language, even though English is the lingua franca of the online gig economy. This indicates that transaction costs are increased by tacit differences related to different mother tongues, which platforms cannot easily equalize. This, in turn, additionally prevents the online gig economy from being a truly global labour market.

Importantly, country-by-country attributes can influence cross-country trade according to two different logics, or perspectives, which we could not explore all at once. In our study, we give prominence to an uncertainty-avoidance (transaction-cost) perspective on 'distance' over a regime-competition (direct-cost) perspective: While the first approach assesses whether distance (or, rather, proximity) reduces uncertainty by limiting transaction costs, the second highlights direct cost savings resulting from accessing more favourable (wage, skill or institutional) gig countries. In our study, we adopted a regime-competition approach only for wage differentials (expressed in the variable's directional measurement), because work requesters clearly hire gig workers for their cheaper – rather than for their more predictable – wages. This is less straightforward for the skill- and institution-related reasons that lead gig requesters to hire online workers – both at a theoretical and a statistical level. Statistically, low-wage, low-skill and low-institutionalized countries are so highly correlated that a regime competition logic (expressed in directional variables) leads to multi-collinearity problems in our dataset. And at a theoretical level, it is very likely that requesters hire gig workers not necessarily to get access to a superior skill- or institutional environment in terms of direct cost savings, but to get access to a more predictable and reliable environment in terms of indirect transaction-cost savings. We therefore adopted an uncertainty-avoidance approach towards distance (expressed in non-directional variables) for the skill- and institutional variables included in our study. While this approach has brought the continued and unexpected importance of geographical proximity to light, also

highlighting the limited importance of skill and institutional differences for gig hiring patterns, future research may want to explore these arguments purely from a regime-competition perspective.

Furthermore, our study provides a conservative estimation of the effects of geographical and institutional differences on hiring patterns, because its scope is limited to European countries. Given that this focus reduces the variation in both geographical and institutional dissimilarities, it is particularly noteworthy that geographical and lingual distance turn out to matter for gig hirings even within Europe. Future research, which may want to re-assess our arguments based on a broader dataset including countries beyond Europe, is therefore likely to find that these drivers increase in importance at the global level. Importantly, though, a robust typology of institutional and cultural indicators of national (labour) institutions does not yet exist at the global level. Therefore, an encompassing coverage of institutional indicators needs to be developed before future research can investigate the roles of institutional distance for the entire online gig economy.

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4

SKILL SPECIFICITY IN THE HIGH-SKILL ONLINE GIG ECONOMY: SAME AS IN TRADITIONAL LABOUR MARKETS?

Abstract

Both economists and sociologists have examined what explains workers' level of skill specificity since it is influential on the economic performance of individuals and countries alike. However, the emergence of the online gig economy changes skill acquisition and specificity altogether, as workers don't need formal credentials (like an educational degree) to offer their labour, skills are "unbundled" away from occupations, and the platforms provide alternative ways to signal competences, via for example the rating system. Therefore, we examine whether individual career trajectories and national institutions predict the skills offered in the online gig economy. Based on multilevel ordinal logistic regression models analysing 2,613 online worker profiles, we show that workers with a vocational educational degree and more experience on the online gig platform offer more specific skills. However, neither offline job tenure, national socioeconomic institutions, nor educational systems affect gig workers' skill specificity. Our findings suggest that online gig platforms allow workers to overcome restrictions imposed by national education and labour market institutions as they can offer those skills in the online gig economy that are institutionally less facilitated and, consequently, less valued in traditional labour markets. Furthermore, platform experience creates a tendency to specialise in specific skills, which might pose a risk in a labour market with high demand volatility.

4.1 Introduction

The skill profiles of workers have been of utmost interest to both economists and sociologists (Diprete et al., 2017; Streeck, 2011) as they are influential for the economic performance of individuals and countries alike. High-skilled workers are systematically better paid than low-skilled workers (Bills, 2003; Stephany, 2021). For countries, the possession and developed skills strongly relate to favourable economic outcomes, such as economic growth, both for the global North and South (Hanushek, 2013; Hanushek & Woessmann, 2012).

It is, however, not only the *level* of worker skills that influences their labour market focus but also their skill *types*, most notably the specificity of skills (Estevez-Abe et al., 2001). Developing more specific skills compared to more general skills creates both opportunities and risks for workers' economic prospects. On the one hand, more specific skills are often associated with higher wages and better labour market opportunities (Golsteyn & Stenberg, 2017; Hanushek et al., 2017; Rosen, 1983), because workers require less on the job training, making them more attractive to employers. On the other hand, acquiring specific skills makes workers more vulnerable to changes in demand (Lavrijsen & Nicaise, 2017; Seifried et al., 2021), which implies that the economic benefits of more specific skill profiles are short-lived over a worker's life cycle (Forster et al., 2016; Forster & Bol, 2018; Rözer & Bol, 2019; Woessmann, 2016).

Given the importance of the skills for workers, various scholars have examined what *explains* workers' skill profiles. In other words, where do the skill sets of workers in general, and the specificity of these skills in particular, stem from? Located at the intersection of political economy, labour sociology, and labour economics, this branch of literature has found that educational as well as labour market aspects, both at the individual and national level, influence the skill specificity of workers. For individual workers, longer job tenure and vocational educational training correlate with more specific skills (Diprete et al., 2017; Neal, 1995). At the national level, workers tend to have more specific skills if they are from countries with higher employment protection and an education system that emphasises vocational training (Busemeyer & Iversen, 2012; Di Stasio & Van de Werfhorst, 2016).

These typical mechanisms leading to the acquisition of specific skills may be changing with the advent of the online gig economy, where workers provide digitally transferable services via internet-based platforms (De Stefano, 2015). Gig platforms allow the supply and demand for service jobs to meet and transact online, whereby gig workers do not need specific educational credentials (such as a diploma). This allows workers to present their skills acquired in new ways. Furthermore, platforms create an environment where the signalling of competences through traditional signals, like job tenure, is getting less important while the platform's rating systems and written reviews are gaining in importance (Herrmann et al., forthcoming). As a consequence, platforms offer the opportunity to deviate from standard and traditional careers, to foster informal learning practices (Larke et al., 2019; Margaryan et al., 2020), and to apply for jobs which are beyond

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reach in traditional labour markets. Finally, platforms also uncouple occupations into particular "tasks", thereby lowering the search costs for requesters to gather information about certain skills, which also implies that certain skills no longer need to co-occur as in common occupational profiles (Gomez Herrera et al., 2017; Horton & Zeckhauser, 2010).

The advent of online platforms raises the question of whether traditional predictors of skill specificity in general, including national education systems and labour-market institutions in particular, are still relevant in the online gig economy: Are specific skills by workers active on online platforms correlated with the same individual and national institutional factors as in traditional offline labour markets?

To address this question, we examine the profiles of 2,613 workers in 23 countries active on one of the biggest online gig economy platforms for high-skill jobs. Based on multilevel random intercept ordinal logistic regression analyses, we investigate to what extent the skill sets of gig workers are driven by individual education and work experience on the one hand, and by national institutions on the other.

We find that the personal background at the individual level is highly correlated with gig skill specificity. That is, the *personal* educational trajectory of workers as well as their personal online job tenure are relevant predictors of skill specificity. Workers with a background in vocational training and a long-standing gig experience offer more specific skill sets. Surprisingly, however, we find that *national* education and labour-market institutions affect the skill specificity of gig workers in the opposite way than on traditional labour markets: Workers from countries with a stronger vocational education system and higher employment protection are hired for more general skills than workers from countries with lower vocational education systems and a more flexible labour market. Together with the finding that traditional job tenure does not predict workers' skill specificity, this suggests that the online gig economy functions as an alternative labour market, substituting those skills that less frequent on traditional labour markets. Workers with less requested skill profiles on traditional labour markets offer their specific skill sets in the online gig economy.

We structure the paper as follows. In section 2, we build the theoretical framework by elaborating on how the skill specificity of workforces comes about in traditional labour markets. Built on these lines of reasoning, we derive analogue hypotheses on what predicts workers' skill specificity in the online gig economy. In section 3, we elaborate on the empirical approach and the methodological considerations; and we present our analytical strategy. The results of these analyses are presented in section 4. In section 5, we conclude with a summary and discussion of the results.

4.2 Theory

4.2.1 The Online Gig Economy as an Emerging International Labour Market

In contrast to traditional labour markets, the *gig economy* generally refers to paid, one-time service jobs mediated by platforms and carried out by freelancers. There exists a wide variety of work mediated via gig platforms, that can be classified across two dimensions: whether, or not, the service requested is geographically bounded and whether the job requires high or low skills (Woodcock & Graham, 2019). In the *onsite gig economy* (De Stefano, 2015), geographically tethered services are transacted which via online platforms, which can be low-skilled services (such as food delivery or ride hailing), or high-skill services (such as architectural design) (Vallas & Schor, 2020). This contrasts with the *online gig economy*, where digitally transferrable labour services are matched (Graham et al., 2017). Here, low-skill gigs typically include click jobs, such as image tagging, while the high-skill services include programming, as well as administration tasks (Vallas & Schor, 2020).

In this study, we examine online gig platforms transacting high-skill jobs, such as Upwork, Freelancer.com and PeoplePerHour. On these platforms, workers can create a profile without needing an educational degree as an "entry certificate". Workers provide requesters with the relevant skill information via their profiles, indicating e.g., their names as gig workers, profile pictures, a short introductory text about themselves, their past (offline) work experience, and their educational credentials.

Furthermore, online gig platforms provide certain algorithmic information, which structures the matching process. Most importantly, platforms keep track of the number and types of gig jobs completed, as well as of the star-ratings and reviews that gig requesters award to gig workers upon job completion (Demirel et al., 2021; Rahman, 2021; Wood et al., 2019a). In addition, gig workers can complete platform-provided skill tests on a certain topic, such as coding or translating proficiency (Kässi & Lehdonvirta, 2022). Upon completion, gig workers can choose whether, or not, to present their test score on their profile. Finally, gig platforms keep track of whether, and how often, gig workers are hired for skills that they claim to possess (K. A. Anderson, 2017; Stephany, 2021).

The impact of these algorithmic structures should not be underestimated. Wood and colleagues (Wood et al., 2019a) find that algorithmic management creates an intense work pressure as there is a constant need to get new gigs and remain on top of the gig worker list displayed. Due to the limited transparency of what aspects the algorithmic value, Rahman (Rahman, 2021) calls this constant pressure an "invisible cage". Several studies also show that, when online gig work is used as a supplementary income, gig workers can be selective and take on only those jobs that fully fit their expertise and motivation. But workers dependent on a platform income, do not have this freedom of choice but are often obliged to accept suboptimal or even dangerous tasks Therefore, some workers will limit their work on the platform, or change the type of work they provide on the platform, just to remain profitable (Cansoy et al., 2020; Schor et al., 2020; Sutherland et al., 2020).

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4.2.2 Skill Specificity in the Online Gig Economy

To examine skill specificity in the online gig economy, it is first necessary to clearly define this concept. So, what is skill specificity? The concepts of skill formation and the related notion of skill specificity are central to economic-sociology and political-economy research alike (Busemeyer & Iversen, 2012; Diprete et al., 2017; Estevez-Abe et al., 2001; Streeck, 2011). While these literatures are similar in their focus on skill formation and skill specificity, the approaches taken towards conceptualizing skill specificity differ, while a clear-cut application of skill specificity to the gig economy is missing to date.

For conceptual clarification, we depart from the prominent work of Gary Becker (Becker, 1964) who points to an essential distinction between "general" and "specific" skills. Becker conceptualises *specific skills* in terms of their limited transferability. In their most extreme form, a specific skill increases the productivity of its holder only within the context of one firm, which implies that specific skills are only useful within the context of a single firm. In contrast, *general skills* are applicable across multiple firms, with the extreme form of general skills being skills applicable to all firms in the economy. Importantly, Becker explicitly describes skill acquisition as an investment into a certain kind of (human) capital that can be used in different contexts, whereby the variety of contexts determines the "generality" of the skills. Thus, the archetypical general skill increases productivity in the same amount across all firms, whereas a completely specific skill loses all applicability in any setting other than one particular firm.

Becker's rather narrow conceptualisation of specific skills is less applicable to the context of the online gig economy. In traditional labour markets, workers have an occupation (such as sales agent or high-school teacher) which implies that they need to hold a certain bundle of skills in order to fulfil the requirement of the respective occupation, thereby automatically having a distinct bundle of skills. Services offered in the online gig economy, by contrast, reflect the "unbundling" of skills, as gig workers are typically hired to perform distinct tasks which are not linked to traditional occupations. In other words, workers offer their services no longer under the heading of an occupation or job title, but rather indicate in their profile what individual skills they possess which, in turn, are associated with certain tasks for which they can be hired. In addition, gig workers provide services for a multitude of requesters, making it rare that gig workers complete jobs for only one particular gig requester. Given that gig workers offer their skills as individuals on the digital market, Becker's concept of firm-specific skills can, therefore, not be directly translated to the gig economy.

Yet, building on Becker's distinction, Estevez-Abe et al. (2001) developed a more applicable concept of *industry-specific skills*. Accordingly, they propose a more fine-grained differentiation between specific skills, separating the latter into firm-specific skills (that only enhance productivity within a single firm) and industry-specific skills (which can be utilised across firms in the same industry, but not in firms of different industries). This latter concept of industry-focused skill specificity is transferable to the online gig economy as individual gig skills can be aggregated into industries. Therefore, we here follow the definition of Estevez-Abe et al. (2001) and conceptualise specific skills as industry-specific skills rather than firm-specific skills.

But what explains the skill specificity of workers in the online gig economy? When looking at the political-economy and labour-sociology literatures on worker skills (Busemeyer & Iversen, 2012; Hanushek et al., 2017; Parsons, 1972; Van de Werfhorst, 2011), four key factors can be identified that influence skill specificity, namely their *individual* (1) educational and (2) professional trajectories, as well as *the institutions* governing their country's (3) education system and (4) labour market. Given that gig workers have been trained and educated within the framework of a country's institutions, we expect that this geographically bounded trajectory influences the skill sets they offer, even if the online gig economy is geographically unbounded.

In this regard, it is important to note that the online gig economy does *per se* not constitute a random selection, nor a representative sample, of national labour markets. Consequently, one can derive competing hypotheses about the influence that national education and labour-market institutions may have on the type of skills hired in the online gig economy. On the one hand, one could expect an additionality effect, meaning that skills hired on online labour markets are, simply, of the same type as those hired on traditional labour markets, because gig workers have been exposed to the same education system and labour-market institutions as workers on traditional labour markets. On the other hand, one could expect a substitution effect, meaning that the skills hired in the online gig economy are those that are less fostered by national institutions and, hence, less available on traditional labour markets. In this setting, gig workers with a skill set which is undervalued in their traditional labour market will offer their skills through online labour markets, whereas workers with skills sets of high demand in the traditional labour market do not have a reason to result to the an alternative market (Wood et al., 2019b). Importantly, the substitution argument considers gig worker skills to be exogenously given, which is not the case for the additionality argument. Therefore, we here follow the additionality argument on institutional influence and, accordingly, derive our hypotheses from the same factors that were found to influence skill specificity in traditional labour markets.

4.2.3 Individual-Level Career Trajectories as Drivers of Skill Specificity

First, referring to the individual background of workers, various studies show that the educational trajectories of workforces shape their skill sets (Hanushek et al., 2017; Rözer & Bol, 2019). Vocational training provides workers with skills that allow them to complete tasks requested in the industry-related occupations for which they have been educated (Rözer & Bol, 2019). To smoothen school-to-job transitions, vocational graduates acquire specific skills that are immediately productive and reduce on-the-job training requirements, making them more attractive for employers (Noelke et al., 2012; Van de Werfhorst, 2011).

In contrast, general tertiary education focuses on a broad set of knowledge and general skills, going beyond the narrow practicability of an occupation or firm. As a result, general education graduates are trained to quickly acquire on-the-job training and be prepared for different jobs, increasing their adaptability to changes in demand (Forster et al., 2016; Krueger & Kumar, 2004). Following this line of reasoning, we hypothesise:

H1a: Gig workers whose highest educational credential is a vocational degree offer more specific skill sets in the online gig economy than workers with other educational degrees.

H1b: Gig workers whose highest educational credential is a master or PhD degree offer less specific skill sets in the online gig economy than workers with other educational degrees.

Next to their educational trajectory, workers' job experience is also vital for understanding their skill profiles (Parsons, 1972). Regardless of how strong the school-to-job linkage is, there will always be additional on-the-job learning for workers to function within a given firm or industry. This is particularly true if the educational degree was obtained further back in time. On-the-job training and learning-by-doing generally translates into the acquisition of specific skills. As Adam Smith (Smith, 1776) already argued, specialisation is beneficial for productivity and profit. Due to the repetition of similar work, workers enhance their capability of these specific skills, thereby increasing their productivity (Shaw & Lazear, 2008). At a general level, this implies that – whenever markets create an efficient division of labour – these specific skills enhance productivity, thereby leading to increased wages. Rosen specifies this line of reasoning by arguing that "rationally endowed individuals are incentivised to specialise their investment in skills" (Rosen, 1983).

While this argument is generally applicable for work experience (irrespective of whether, or not, it is acquired within the context of the same firm), this line of reasoning is particularly applicable to job tenure, i.e., work experience acquired within one firm. Job tenure indicates the opportunity to repeat similar work and fully master the respective job, creating an additional incentive to acquire more firm-specific skills. In contrast, whenever workers switch jobs repeatedly, such on-the-job practice will be lacking. Longer job tenure also bears the opportunity to specialise within the given occupation because, to do so, a certain understanding of the basic, fundamental tasks is required. A longer job tenure thus allows workers to acquire more specific skills (Parsons, 1972). On the contrary, short job tenure implies that workers often change jobs, thereby providing varying labour settings and tasks. This prevents workers from acquiring specific skills yet allows them to develop general skill profiles.

Although job tenure in its traditional meaning does not exist in the online gig economy, because requesters vary and repeated gigs are rare, job experience can still provide skill specialisation. In the online gig economy, jobs are classified based on the skills needed, and the algorithms facilitate lock-in effects where gig workers are supported to be hired for the same set of skills via the algorithmic structure (Larke et al., 2019; Wood et al., 2019a). Completing only a distinct type of tasks provides a comparable opportunity for skill specialisation as job tenure does in the traditional labour market. Job tenure in the gig economy thus comes down to repeatedly completing the same task, thereby gaining more specific skills. Following this line of reasoning, we hypothesise that:

H2a: Workers with longer job tenure in traditional labour markets offer more specific skill sets in the online gig economy.

H2b: Workers with longer job tenure in the online gig economy offer more specific skill sets in the online gig economy.

4.2.4 Institutional Drivers of Skill Specificity

The economic-sociology and political-economy literatures on education point out that skill specificity of workforces is not only a result of their individual educational credentials and work experience but also of the broader institutional context governing a country's education system and labour market flexibility. More specifically, and next to individual-level backgrounds, the skill specificity of national workforces is additionally influenced by education and labour market institutions at the national level. These institutions can reinforce, or dampen, the individual-level choice of under-going vocational and even non-vocational tertiary education by providing a more, or less, labour-market oriented trajectory.

Research into the role of education systems has a long-standing tradition in the sociological literature (Allmendinger, 1989; Shavit & Muller, 1998). This literature argues that education systems vary between countries on three institutional features: external differentiation, standardisation, and vocational orientation (Allmendinger, 1989). External differentiation refers to the extent to which different educational programmes, with a clearly understood hierarchy, exist at the same time within an educational trajectory. The level of standardisation of an education system refers to the extent to which the quality of education meets the same standards nationwide by means of, for example, central exams and a uniform curriculum. The level of vocational orientation indicates the extent to which education provides students with vocational skills, distinguishing additionally between the specificity of these skills. It is important to note that the differences in education systems are not indicative of the quality of the education in a country. Instead, education systems have multiple societal functions, so that the positioning on all these three dimensions reflects trade-offs between these functions (Bol & Van de Werfhorst, 2013b, 2013a).

For skill specificity, the relevant dimension of institutional variety is the level of vocational orientation. Continental European countries (such as Austria, Germany and Switzerland) have highly vocational education systems. On the other hand, Anglo-Saxon countries (such as Ireland and the UK) have education systems with low levels of vocational orientation. The literature shows that workers in countries with highly vocational educational systems have more specific skills (Busemeyer & Trampusch, 2012). Higher vocational orientation creates clearer education-work linkages throughout the education system, increasing the specificity of worker' skills (Breen, 2005). Therefore, we formulate the following hypothesis:

H3: Gig workers from countries with vocationally oriented education systems offer more specific skill sets in the online gig economy.

The second type of national institutions that were found to foster skill specificity is labour market flexibility. To understand the influence of labour market flexibility on skill specificity, it is important to understand that investing in specific skills has economic benefits and risks. While the benefits of having specific skills are higher wages and better occupations (Forster et al., 2016; Rözer & Bol, 2019), workers with specific skills are vulnerable to changes in demand for these skills (Lavrijsen & Nicaise, 2017; Seifried et al., 2021). For example, Forster et al. (2016) show that workers with specific skills have better labour prospects in the short term but have diminishing returns over their life cycle, because workers with general skills can better adapt to changes in demand. In other words, when workers change firms or jobs, or when the economy changes and requires different skills, some skill investments become obsolete.

The Varieties-of-Capitalism (VoC) literature builds on this reasoning to explain country differences in the skill specificity of national workforces (Amable, 2003; Estevez-Abe et al., 2001; Hall & Soskice, 2001; Hancké et al., 2008). To this end, the VoC literature categorises the global North into a dichotomy, namely Coordinated Market Economies (CMEs) and Liberal Market Economies (LMEs). CMEs, such as Germany, are characterised by a stronger labour market regulation and, hence, lower labour market flexibility. For example, most employees can only be dismissed for specific reasons, after longer notice periods, and in consultation with a firm's works councils. The long-term perspective of working for the same firm thus decreases the risk that the investment into specific skills may become obsolete, thereby incentivising workers to invest in specific skills (Busemeyer & Iversen, 2012). Contrary to that, LMEs (such as the United States) are characterised by low employment protection and high labour flexible labour market. Hire-and-fire at short notice is possible without providing specific reasons and without the need to involve employee representatives or works councils. This implies that, in LMEs, specific skills have a higher risk of becoming obsolete which, in turn, incentivises workers to chiefly invest in general skills.

While the arguments of the Varieties-of-Capitalism literature have originally been developed through studies of the manufacturing sector, later studies show that their logic also applies to the service sector, even though service workers overall tend to have a higher need and use of general skills (K. M. Anderson & Hassel, 2008). Furthermore, Jensen (2011) shows that de-industrialisation, i.e. the transition of manufacturing workers into service sector jobs, resulted in re-skilling and a further development of national education trajectories in Coordinated Market Economies (CMEs). This was not the case in Liberal Market Economies (LMEs), where the more general skill sets of manufacturing workers allowed them to transition to service sector work without specialised education and training. In addition, Anderson and Hassel (2008) argue that, in Coordinated Market Economies, the transition process towards a service economy was supported by the already existing institutions, training capacity and economic logic in Coordinated Market Economies, fostering skill specificity of service sector workers.

While the argument of the VoC literature has become widely accepted, its dichotomisation into CMEs and LMEs has been criticised and followed by an extensive debate about *how many* varieties of capitalism should be distinguished (Amable, 2003; Hancké et al., 2008;

G. Jackson & Deeg, 2006). Accordingly, various authors suggest to differentiate between more varieties of capitalism, such as Dependent Market Economies and Mediterranean Market Economies (Nölke & Vliegenthart, 2009), while others suggested a more fine-grained operationalisation of labour market institutions (Hall & Gingerich, 2009; Höpner, 2007). Furthermore, (Schneider & Paunescu, 2012) show that national institutions are dynamic and diverse within these categories and develop differently over time. We follow their argument to move beyond a dichotomous classification between CMEs and LMEs by considering the acutal level of employment protection . After all, it is a country's labour market flexibility that influences the specificty of worker skills, not its classification as a CME, LME, or additional form of capitalist variety. Accordingly, we hypothesise that:

H4: Workers from countries with stronger employment protection in the traditional labour market offer more specific skill sets in the online gig economy.

4.3 Method

4.3.1 Data Collection

To test these hypotheses, we analysed gig workers' skill profiles on one of the largest online gig platforms worldwide. The gig platform in question specialises in high-skill jobs that are digitally transferable, ranging from programming and design to writing tasks. This platform offers a thorough overview of its gig workers via their publicly available profiles, including the gig workers' skill sets, educational credentials, work history, and previous work experience.

Our reasons to sample our data from this platform were threefold. First, it is amongst the largest platforms for online, high-skill gig jobs in the online gig economy, which increases the external validity of our results and allows generalisations to the online gig economy as a whole. Second, the platform provides the necessary information on the work history of gig providers. More concretely, this platform is one of the few that, within the gig workers' profiles, provides publicly available information on their work history (as far as it has been reviewed), the skills they offer, as well as the platform-designed skill tests completed. Third, the platform in question imposes hardly any direct control on the matching process of gig workers and requesters. Gig requesters can directly message workers or post a job for which workers can apply. While the platform manages the information about gig requests and offers through algorithms, requesters can freely choose whom to hire. This ensures that our results are as little biased by the platform's algorithmic control as possible.

We confined our country selection to 23 countries in the Global North because the data available for these countries make it possible to clearly identify their national education and labour-market institutions while varying sufficiently to test our hypotheses. Accordingly, we collected skill profiles from gig workers residing in one of

the following countries: Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, The Netherlands, New Zealand, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and the United States.

Since gig profiles can rapidly change over time, it was essential to collect the necessary data within a short timeframe. Therefore, we collected the publicly available profiles of gig workers between 16 and 22 December 2019 using a scraping algorithm. We restricted our sample to workers who: (1) have completed at least one gig job for which they obtained a review and (2) who mentioned an educational degree on their profile. The aforementioned sampling approach led to a dataset containing 2,613 gig workers.

By only collecting a limited amount of the platform's overall data, in line with our research requirements, we ensured that data collection was in line with the platform's intellectual property rights. By pseudonymising the data collected, we complied with the GDPR and privacy requirements. Our data collection process was approved following an ethics review process at our university.

4.3.2 Operationalisation and Analytical Strategy

We operationalised the dependent variable, ***skill specificity***, on the basis of the skills for which a gig worker was hired most often. For every job advertised on the platform, the gig requester needs to indicate which skills are needed for successfully completing that gig job. Given that these most hired skills describe the gig worker's skill set most reliably, this indicator has been used in several investigations of the online gig economy (K. A. Anderson, 2017; Stephany, 2021). To indicate the most appropriate denomination for the skills needed, requesters can choose from a list of overall 1,252 skills, pre-defined and described by the platform. Each of these skills is attributed by the platform to one of 12 distinct industries[7]. To determine the specificity of a worker's skill profile, we counted the number of different industries to which the five most hired skills belong. This resulted in a variable ranging from 1 (where all five of a gig worker's most hired skills are from the same industry) to 5 (where all of the five most hired skills belong to different industries). Given that the variable was highly skewed, we clustered the workers where the five most hired skills belong to three or more industries together, creating a total of three categories. Since our hypotheses are on skill specificity, we reversed the order of these categories, so that workers in category 1 are chiefly hired for their general skill set, while workers in the third category are hired for their specific skill set[8].

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7 These industries are: "Business, Accounting, Human Resources & Legal", "Data Entry & Admin", "Design, Media & Architecture", "Engineering & Science", "Freight, Shipping & Transportation", "Local Jobs & Services", "Mobile Phones & Computing", "Product Sourcing & Manufacturing", "Sales & Marketing", "Translation & Languages", "Websites, IT & Software", and "Writing & Content".

8 Given that the skill hirings are dependent on supply and demand, we used as alternative measurement for skill specificity of self-reported skills presented on the profile. We again classified these skills based onto 12 categories, creating a skill specificity index ranging from 1 to 9. Accordingly, we here use multilevel linear regression models. These analyses using this alternative dependent variable showed our results are robust and are presented in Appendix Table B2.

The first main independent variable is the ***educational attainment*** of an individual. We operationalised a gig worker's educational degree by carefully investigating the educational credentials on his/her profile in order to identify the highest educational degree obtained. Accordingly, we classified the educational credentials as either a vocational degree, a bachelor's degree, a master's degree, or a PhD degree. Whenever the degree obtained could not be unambiguously determined, we removed the degree from our dataset. When all the degrees from a worker could not be classified properly, the gig worker was removed from the analyses. Gig workers who did not indicate educational information in their profile, were removed as well[9]. Given that educational attainment is an ordinal variable, it was included in the respective models as a set of dummy variables, allowing for a nonlinear effect. In the analyses, vocational degree was used as the reference category, since we hypothesize that these gig workers would provide the most specific skills, therefore only odds ratios lower than one are to be expected.

We measured the second main independent variable at the individual level, ***maximum job tenure in traditional labour markets,*** by calculating the months a gig worker had held a position in the traditional labour market. This information was available in the online profiles of gig workers whenever they indicated their previous work experience. When multiple work experiences were indicated on the profile, the longest job tenure of all work experiences was taken. This resulted in a variable ranging from 0 (indicating 0 months of traditional job tenure) to 647 months (indicating almost 54 years of work experience in a traditional job). Due to the indicator's skewness, we added one and log-transformed the variable before including it in our models.

The third main independent variable at the individual level, ***job tenure in the online gig economy*** was measured by using the number of completed gig jobs on the platform. This resulted in a measurement ranging from 1 to 1,593. Also, this variable is highly skewed, as 27% of the gig workers included in the sample have completed only one gig job on the platform in question. Therefore, the variable was log-transformed before including it in the respective models.

As a first independent variable at the country level, we measure the ***level of vocational orientation*** of a country's education system, following (Bol & Van de Werfhorst, 2013b). They argue that vocational orientation has two dimensions, namely (1) the prevalence of vocational enrolment and (2) the specificity of vocational education. Since we already consider individual educational trajectories, we solely use vocational specificity as an indicator of an education system's vocational orientation. The vocational specificity is best captured by the extent to which learning occurs in a dual (school-based and work-based) form. We accordingly measure the strength of this dual system by calculating the percentage of students in upper secondary education in a dual system. We use macro-level data on the vocational specificity collected in 2014[10].

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9 As a robustness check, we redid the analyses including those gig workers that did not report their educational credentials by classifying them into an additional educational category: "no valid educational trajectory reported". This did not change the substantive interpretation of any of our results. The analyses are available on request.

10 The dataset used to classify education systems can be downloaded from the following webpage: http://thijsbol.com/data/

To measure the second independent variable at the institutional level, **_employment protection_**, we follow the institutional literature (Dilli et al., 2018; Hope & Martelli, 2019; Schneider & Paunescu, 2012; Witt & Jackson, 2016), which frequently uses the OECD's "_indicator of regular employment protection legislation_"[11] to this end. The indicator includes the conditions for terminating employment, the involvement of third parties (such as works councils) in dismissal procedures, the length of notice periods to be respected, severance pay, required conditions for laying off employees, the repercussions of unfair dismissals, and provisions for collective dismissals. The indicator combines this information into one numeric value, ranging from 0 (no employment protection) to 6 (highly stringent employment protection), thereby measuring the strictness of employment regulation. Given that the most recent moment of measurement differs between countries and given that workers have experienced their traditional labour markets at varying moments in time, we took the average value of all data measurements since 1990. We expect this indicator not to be biased by this long timeframe because institutional change is a slow, gradual process (Mahoney & Thelen, 2009; Thelen, 2009). The level of vocational orientation and employment protection per country are presented in the Appendix Table B1.

TABLE 4.1 | **Descriptive statistics.**

Dependent variable	Range	Mean	SD
Skill specificity: General Skills	0 / 1	0.21	–
Skill specificity: Mixed Skills	0 / 1	0.40	–
Skill specificity: Specific Skills	0 / 1	0.39	–
Individual variables (N=2.613)			
Degree: Lower than Vocational	0 / 1	0.03	–
Degree: Vocational	0 / 1	0.07	–
Degree: Bachelor	0 / 1	0.52	–
Degree: Master	0 / 1	0.35	–
Degree: PhD	0 / 1	0.02	–
Offline job tenure (months)	0 – 647	65.91	73.00
Online job experience	1 – 1593	32.73	84.20
Five-star rating	0 / 1	0.46	–
Missing work experience	0 / 1	0.25	–
Country variables (N=23)			
Vocational specificity	0 – 60	13.60	17.69
Employment protection	0 – 4	1.97	0.80

Finally, we added a dummy as a control for all workers that did not indicate any offline work experience on their profile. Not including this control variable could bias the effect of offline job tenure because workers with no traditional job experience and gig workers who did not completely fill in their online profile are lumped together. Additionally, we control for the rating of gig workers, because only highly rated workers may be free to choose jobs in line with their skill specialisation. If they are less highly rated, gig workers may be obliged to assume jobs that do not reflect their actual skill sets. Given the extreme

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11 https://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection.htm

skewedness of the variable (as most gig workers have a rating that is very close to five stars), we computed a dummy variable capturing whether, or not, a gig worker has an overall rating score of five stars. Table 4.1 provides an overview of the descriptive statistics of the variables included in the analyses.

4.3.3 Analyses

We test our hypotheses with multilevel random-intercept ordinal logistic regression models (Liu, 2015) in which individuals are nested in countries. If the multilevel structure would be ignored, the standard errors of the parameters were underestimated, creating a possible overestimation of the statistical significance of higher level effects (Hox et al., 2010). We use ordinal logistic regression models, because our dependent variable is ordinal with three categories. Before estimating the regression models, we also examined possible multicollinearity problems by calculating the VIF scores of all independent variables. No multicollinearity was detected.[12] Next, we show the bivariate relationship between the institutional variables and skill specialisation and ensure that the final models do not overcontrol for the institutional effects by adding the individual variables. Furthermore, to correctly estimate country-level institutions with 23 countries in our dataset, Model 1 only includes individual-level variables. Models 2 and 3 then add the two institutional variables separately to the analyses, whereas Model 4 shows our final model with both institutional characteristics included. Odds ratios are presented, and all hypotheses are tested two-sided.

4.4 Results

Figure 4.1 shows the relationship between the country level skill specificity and institutional variables. On the y axis, the average skill specificity, measured by the three aforementioned categories, is presented, and on the x-axis the levels of vocational specificity (Panel A) and employment protection (Panel B) are shown. Both panels show no positive relationship between the institutional variables and skill specificity of gig workers. Panel A even seems to indicate a negative relationship, opposite to what would be expected. However, these surprising results could be due to compositional differences of gig workers.

Therefore, to test the aforementioned hypotheses, Table 4.2 reports the results of the regression models predicting the skill specificity of gig workers. With regard to education, the results show a clear and robust pattern across the various models (for visual presentation see Appendix Figure B1 for the marginal effects): although not all differences are significant, education has an impact on the level of skill specificity. Furthermore, the results show that workers with a vocational degree have skills with the highest level of specificity, while both workers with lower than vocational education and workers with high general education (including those with a master's degree and those with a PhD degree) provide skills with a lower specificity level. Model 4, on which

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12 The VIF scores are presented in Appendix Table B3.

we test our hypotheses, shows that the difference between vocational degree (reference category) and both gig workers with a lower than vocational degree (OR = 0.607, SE = 0.150, p < .05), and gig workers with a master's degree is statistically significant (OR = 0.725, SE = 0.114, p < .05). These results show that gig workers offer skill types in line with their individual educational trajectories: gig workers with a training that provided them with a more specific skillset offer more specific skills on the online gig economy, and vice versa. Therefore, our results support hypotheses 1a and 1b.
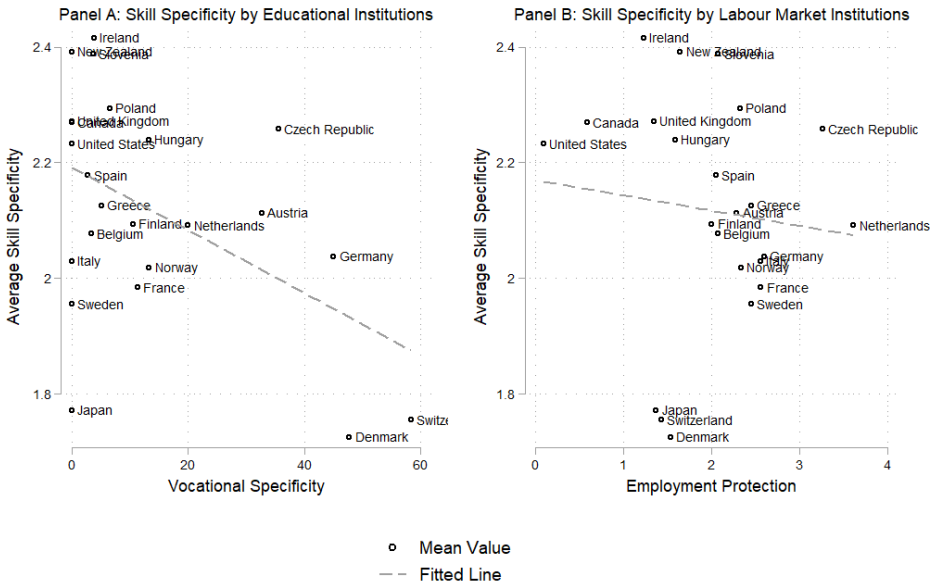
FIGURE 4.1 | **Country's average skill specificity, by educational and labour market institutions.**

TABLE 4.2 | **Multilevel ordinal logistic regression models predicting the skill specificity of gig workers.**

	Model 1		Model 2		Model 3		Model 4	
	OR	SE	OR	SE	OR	SE	OR	SE
Education (Vocational=ref):								
Lower than Vocational	0.593**	(0.147)	0.607**	(0.150)	0.593**	(0.147)	0.607**	(0.150)
Bachelor	0.850	(0.130)	0.859	(0.132)	0.843	(0.129)	0.855	(0.131)
Master	0.724**	(0.114)	0.730**	(0.115)	0.716**	(0.113)	0.725**	(0.114)
PhD	0.652	(0.183)	0.653	(0.182)	0.640	(0.179)	0.645	(0.180)
Offline job tenure (Ln)	0.841*	(0.077)	0.841*	(0.077)	0.842*	(0.077)	0.841*	(0.077)
Online job experience (Ln)	1.117**	(0.050)	1.121**	(0.050)	1.118**	(0.050)	1.121**	(0.050)
Vocational specificity					0.899*	(0.053)	0.935	(0.049)
Employment protection			0.814***	(0.053)			0.842***	(0.055)
Average five-star rating (0/1)	0.850*	(0.078)	0.854*	(0.078)	0.852*	(0.078)	0.855*	(0.078)
Missing work experience (0/1)	0.630**	(0.127)	0.628**	(0.127)	0.634**	(0.128)	0.631**	(0.127)
R² (McKelvey&Zavoina)	.015		.029		.018		.029	
N (Countries)	23		23		23		23	
N (Individuals)	2,613		2,613		2,613		2,613	

Note. * p < .10; ** p < .05; *** p < .01

When looking at the association between maximum job tenure and skill specificity, the results are insightful as they are less clear-cut than expected. When examining the maximum job tenure in the offline labour market, we find a negative effect on skill specificity – significant at an alpha of .10 – where a positive effect was hypothesised (OR = 0.841, SE = 0.077, p < .10). Gig workers with a longer maximum offline job tenure offer more general, rather than more specific, skills in the online gig economy. It seems that specialisation via job tenure in the offline labour market does not immediately translates into specialisation in the online gig economy as well. Therefore, Hypothesis 2a is rejected. Interestingly, though, the opposite relationship can be observed for online maximum job tenure. More specifically, the results indicate a robust and strongly positive relationship between the number of reviewed transactions a gig worker has completed and his/her skill specificity (OR = 1.121, SE = 0.050, p < .05). In other words, the more tasks a worker completes, the more specific her skillsets become. We thus find specialisation via job tenure in the online gig economy when examining online job tenure. This supports hypotheses 2b.

Finally, the results regarding national institutions show surprising results. Contrary to our expectations, we find that the level of employment protection has a negative association with the specificity of gig workers' skills on the online gig economy. This association is statistically significant not only on Model 2 (where it is the only national institutional variable included) but also remains robust in the final model (OR = 0.842, SE = 0.055, p < .01). Gig workers from countries with more employment protection offer more general rather than more specific skills in the online gig economy.

A similarly surprising finding emerges for the association between the level of a country's vocational specificity and the skill specificity of gig workers from that country: Model 3 shows a negative effect of the level of vocational specificity of a country and the skill specificity of gig workers from that country, significant at an Alpha of .10 (OR = 0.899, SE = 0.053, p < .10), whereby this association loses any significance when controlled for the level of employment protection in a country (OR = 0.935, SE = 0.049, p = .20). In sum, both results obtained for how the institutional context of a gig workers influences his/her skill specificity suggest the reverse relationship between skill specificity and national institutions to what was expected based on existing literature from traditional offline labour markets. We do thus not find support for hypotheses 3 and 4.

4.5 Discussion

Long-established literature strands in economic sociology and labour economics examine the factors that explain the level and specificity of workers' skills in the labour market (Diprete et al., 2017; Streeck, 2011). They have shown that individual career characteristics, such as educational training and job tenure, as well as national socio-economic institutions influence the specificity of worker skills. This study examines whether the online gig economy challenges these existing theories of skill specificity: in particular, whether the online gig economy is a novel kind of market with its own set of rules, or whether skill specificity in the online gig economy reflects well-known mechanisms

from traditional labour markets. By using multilevel ordinal logistic regression models on 2,613 worker profiles from one of the largest online gig platforms world-wide, the paper accordingly investigates whether individual-level education, traditional and online job tenure, as well as national education and labour-market institutions determine skill specificity in the digital economy. The findings demonstrate that gig workers with a vocational educational degree and more work experience on the online platform offer more specific skills. However, neither job tenure in the traditional labour market nor national socio-economic institutions affect gig workers' skill specificity.

In line with both the established socio-economic and labour-economics literatures on labour market skills (Hanushek et al., 2017; Noelke et al., 2012; Rözer & Bol, 2019) and with the – still nascent – literature on education in the online gig economy (Cedefop, 2020; Lehdonvirta et al., 2019), our study finds that *individual* education trajectories influence the skill specificity of the skills offered in the same way as it does in the traditional labour market. In other words, the skills acquired through education are offered by gig workers in the digital economy (Wood et al., 2019a). In that way, the education of gig workers influences the type of skills they offer on gig platforms, creating an indirect influence of education on the digital labour market structure. In addition, we find that individual work experience facilitates specialisation effects in the online setting. In line with a growing part of the gig economy literature, our study thus shows that online gig platforms create a context of informal learning (Margaryan, 2019). Our findings thus speak to earlier studies which show that high-skill online gig workers frequently developed new skills during their platform work and that these skills are often closely related to their area of expertise (Larke et al., 2019; Margaryan et al., 2020). Our study adds the insight that learning via platform work does not only allow workers to develop more skills, but also more specific skills which allow them to specialise in certain gig tasks.

Moreover, and contrary to the established political economy literature (Parsons, 1972; Shaw & Lazear, 2008) our study does not find a relationship between job tenure in the traditional labour market and the specificity of skills offered on the platform. Working in the same occupation for a longer time period, which normally gives workers more opportunities to learn specific skills, does not correlate with more specific skills on the online gig platform. One explanation could be that the specific skills acquired in the traditional job market are not transferable to the context of the online gig economy (Cedefop, 2020). Through job tenure in traditional labour markets, workers repeatedly do the same type of job, thereby specialising in a bundle of tasks specific to one firm or industry. These bundled specialisations do not relate to the task structure in the online gig economy, where workers are hired for a particular task, algorithmically structured by the type of skills within a task, and frequently by varying requesters. In addition, the signalling value of offline job tenure might be weak compared to the skill signals provided or verified by the platform, thus reducing its influence (Lehdonvirta et al., 2019). It could even be the case that workers with longer job tenure use the online gig economy to do something new. All in all, the online gig economy clearly poses a market where different kinds of skills are offered compared to those skills that are acquired by the majority of workers in traditional, offline markets.

Finally, and contrary to the institutional literature on worker skills (Busemeyer & Trampusch, 2012; Van de Werfhorst, 2011), we find that national institutions have an unexpected effect on skill specialisation offered by online gig workers. Gig workers from countries where the institutions foster specific skill accumulation – by having a more vocationally oriented education system and a more regulated labour market – offer more general skills on online gig platforms. This shows that online gig platforms constitute a new institutional environment (in line with Wood et al., 2019b), which allows workers to circumvent their traditional labour market restrictions (Graham et al., 2017). Thereby, online labour markets enable workers to offer and develop skill profiles that are less frequently requested in their traditional labour markets. These results speak to a previous study by Herrmann (2008) showing that in traditional labour markets, firms employ workers from abroad whenever national labour-market institutions imply that the required skill profiles are scarce. Our study provides evidence that online gig platforms allow for such substitution effects also on the supply side: High-skilled online gig workers, who have acquired specific skill profiles that are less frequently requested in their local labour market can offer these skills via platforms, even if their traditional labour markets value more generalised skill sets – and vice-versa. This suggests a selection and substitution effect, where online gig markets allow gig workers to overcome restrictions imposed by their national institutions, which empowers gig workers to provide a type of skills, and maybe even foster a type of skill development, in contrast to what their traditional market facilitates.

It is important to note that our study gives insights into the functioning of the high-skill online gig economy, which cannot be generalised nor translated one-to-one to the low-skill gig economy nor to the onsite gig economy. The low-skill online gig economy is very supply driven, with little change or benefit for skill specialisation, given the little skills required for the gigs (Vallas & Schor, 2020). While this is different for the on-site gig economy, the latter is geographically bounded, which by definition limits the opportunities to circumvent national institutions.

Furthermore, our study provides a conservative estimate to examine the impact of national institutions on skill profiles of gig workers since we limit our sample to countries in the Global North, which has a limited variation of labour market and educational institutions. Further research is needed to see how generalisable our results are beyond Western, Educated, Industrial, Rich and Democratic (WEIRD) countries before the role of nation-wide institutions for the skill formation of gig workers can be discarded. In addition, the online gig economy does not include a representative sample of workers on national labour markets. Various push and pull factors can influence whether, or not, workers will seek jobs on online gig platforms. It could, for example, be possible that workers with specific (or, respectively, general) skill sets are overall more successful in acquiring gig jobs. To counter-steer such potential selection effects, we have here not investigated what kind of skills gig workers actually possess but, rather, for what skill types they are hired. This is possible because, on their profiles, gig workers indicate many more skills (that they possess) than the few ones for which they are hired. In other words, even if work in the gig economy would imply that workers (are better off if

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they developed and, hence,) possessed more specific (or general) skill sets, this does not necessarily correspond to the specific/general skill sets for which they are actually hired. Yet, this empirical focus remains a potential limitation of our study. Finally, we did not examine the horizontal (mis)match between traditional work experience and educational trajectory and the skills offered: Are the industries in which the job experience is gathered and the field of study of the educational trajectory related to the type of jobs done in the online gig economy? By answering these questions, future research can provide more profound insights into the link between institutions governing offline labour markets and the online gig economy.

Overall, our study shows that the online gig economy fosters specialisation in specific skills. This specialisation is one of the selling points of online gig platforms: specialisation in specific skills allows for further division of labour and, therefore, for a better leverage of the competitive advantage of gig workers, who can leverage their scarce skillset (Wood et al., 2019b). However, by allowing for online specialisation, online gig platforms also create a paradox. On the one hand, they offer workers flexibility in tasks and the freedom to choose preferred jobs even when these are different from their traditional work experience. On the other hand, both the platforms' algorithmic management as well as the workers' specialisation patterns create path dependency and a lack of diversification options (O'Mahony & Bechky, 2006). It also makes the position of the online gig worker more vulnerable to the volatility of demand, which is especially prevalent in the online gig economy (Seifried et al., 2021). Specialising in specific skills is therefore a two-edged sword creating economic benefits is the short term, but extra vulnerability for the already precarious position of workers in the longer run.

4

DECIPHERING THE SIGNS: ASSESSING EDUCATIONAL CREDENTIALS AND DEGREE TRANSFERABILITY IN THE ONLINE GIG ECONOMY

Abstract

Signalling theory states that educational credentials yield labour market returns because they signal desirable quality. However, the effect of signals may depend on how educational credentials are embedded in national education systems and labour market institutions. With international hirings, degrees have a limited transferability. Using data on more than 100,000 completed transactions between gig requesters and gig workers, we evaluate the labour market returns of education and degree transferability in the online gig economy as measured by project size. Using multilevel linear regression models, we show that gig workers with a higher education degree acquire bigger gig projects in the online gig economy regardless of whether it is a domestic or foreign hiring. Furthermore, regarding degree transferability, we find that among foreign service hirings, countries' differences in education systems and labour market institutions do not diminish labour market returns on higher education. Our results show the importance of educational degrees as a labour market signal for gig requesters, even in a highly international and newly institutionalised labour market such as the online gig economy.

5

5.1 Introduction

For a long time, sociological research has argued that educational credentials yield labour market returns because they signal desirable skills in a labour market imbued with information asymmetry (Bills, 2003; Weiss, 1995). Since it is difficult to assess the qualities of workers before hiring, labour seekers screen, and labour providers signal via educational credentials.

It is well-known that there is a substantial cross-national variation in the payoffs to education (Breen & Buchmann, 2002; Müller, 2005; Müller & Gangl, 2003), and that differences in national institutions are an important explanation for such variation (Shavit & Muller, 1998). In this literature, national institutions are compared in how they structure education systems in, for example, the level of vocational education (Allmendinger, 1989) and labour market institutions (Andersen & Van de Werfhorst, 2010). The strength and type of signal education provides is dependent on these institutions.

Due to the national institutional embedding of education, the transferability of degrees (Storen & Wiers-Jenssen, 2010) can be limited, since the acquired skills might not match demand in the labour market, or the interpretability of the degree is limited. Therefore, the returns of education can be reduced in international labour markets. The online gig economy, where workers provide digitally transferable services via internet-based platforms (De Stefano, 2015) constitutes an ideal-typical instance of such an international labour market. Gig platforms allow the supply and demand for service jobs to meet and transact online, removing geographical locality as an inevitable constraint in the matching process. Unsurprisingly, labour providers and requesters participate on these platforms across many countries, and cross-country hirings are common (Lehdonvirta et al., 2019). To smoothen the matching process, online gig platforms provide alternative quality signals, universal across countries. The most prominent are the five-star rating system and platform provided skill tests.

 In view of the international nature of the online gig economy, the question raises to what extent differences in education systems and labour market institutions influence the labour market returns of education in the online gig economy? To address this question, we examine 103,362 reviewed high-skill gig jobs on one of the biggest online gig platforms worldwide, completed by 10,116 gig workers across 26 countries in the Global North. In our study, we use fixed effects random intercept linear regression models to investigate how educational credentials on the gig worker's profile impact the project value of completed gig jobs and whether their impact is conditional on differences in education systems and labour market institutions.

Our contributions to the literature are twofold. First, this study provides further insight into the signalling value of nationally embedded labour market signals in international hirings (Heisig et al., 2019; Lehdonvirta et al., 2014; Van de Werfhorst, 2011). We show that even in an environment that offers alternative signals which are not nationally embedded, such as rating systems and skill exams, institutional differences do not render the value of educational credentials for gig requesters obsolete. By doing so, we help understand

the future of formalised education in transforming labour markets. Secondly, we extend the literature on the transferability of degrees beyond the selection of migrant workers (Damelang et al., 2020; Lancee & Bol, 2017; Storen & Wiers-Jenssen, 2010). By examining the online gig economy, we assess workers offering their labour in multiple countries simultaneously. By doing so, we are able to assess the signalling value of educational degrees in international markets of self-employed.

The paper is structured as follows. We begin by giving a brief elaboration on the online gig economy and how these platforms function. Then we provide a review of the existing literature on educational credentials as a signal in traditional labour markets, and how institutions mediate the link to labour market returns. Here we also link these traditional theories to the online gig economy and formulate our hypotheses. Then, we elaborate on our data and operationalisation. Lastly, we present our findings and conclude with a reflection on labour market returns on education in online international labour markets.

5.2 Theoretical Framework

5.2.1 The Online Gig Economy: An Emerging Labour Market

In contrast to traditional labour markets, the *gig economy* generally refers to paid, one-time service jobs mediated by platforms and carried out by *gig workers*, i.e., individuals with the labour status of freelancers (Vallas & Schor, 2020). Requesters can be both firms and individuals (Meijerink & Keegan, 2019). Importantly, gigs and gig platforms respectively can be distinguished on the basis of two dimensions, namely whether, or not, the service requested is geographically bounded and whether the job requires high or low skills (Woodcock & Graham, 2019). In the *onsite gig economy* (De Stefano, 2015), locally bounded services are transacted via online platforms, which can be low-skilled services (such as food delivery or ride hailing), or high-skilled services (such as architectural design) (Vallas & Schor, 2020). The *online gig economy*, on the other hand, consists of labour services that can be digitally transferred (Graham et al., 2017). Here, the low-skilled gig typically includes jobs such as image tagging or other click work, while the high-skilled gig jobs include tasks like programming, and administration (Vallas & Schor, 2020).

On online gig platforms for high-skilled jobs, such as Upwork, Freelancer.com and PeoplePerHour, workers around the world can create an online profile. Importantly, gig workers can set-up profiles without the need to hold a specific kind of 'entry certificate' (such as an educational degree or work permit), suggesting that entry barriers are low. The gig worker profile provides the gig workers' name and profile picture, a brief introductory text about the worker, and presents their past (offline) work experience and acquired educational credentials. Most commonly, gig requesters post a job advertisement on the platform, to which gig workers can apply. The gig requester then chooses a gig worker to complete the project based on his profile. As the concept suggests, each gig project is separately paid.

Furthermore, online gig platforms present additional information to potential requesters. Most importantly, the profile provides insights into the amount of gig jobs completed via the platform, and the average five-star rating received (Demirel et al., 2021; Rahman, 2021; Wood et al., 2019a). In addition, gig workers can complete platform-provided skill tests on a certain topic, such as coding or translating proficiency (Kässi & Lehdonvirta, 2022). After completion, gig workers can choose whether, or not, to present their test score on their profile. Finally, the gig profile offers ample information about the self-reported skills that a gig worker claims to possess and – on some platforms – whether and how often the gig worker has completed gig jobs based on these skills (K. A. Anderson, 2017; Stephany, 2021). These alternative "skill signals" aim to reduce transaction costs and curtail the influence of traditional nationally embedded labour market influences, such as educational credentials and work experience (Lehdonvirta et al., 2019).

5.2.2 Labour Market Returns of Educational Credentials in the Online Gig Economy

According to various screening and signalling theories (Arrow, 1973; Spence, 1981; Stiglitz, 1975; Wolpin, 1977), labour market returns of educational credentials exist because the educational degree provides a *signal* in a market with information asymmetry between labour providers and labour seekers. Without signals, it is difficult for labour seekers to assess the possession of desirable traits. Spence (1973) even compares labour hirings with the purchasing of a lottery ticket without knowing the odds for success. Therefore, labour seekers *screen* potential labour providers' signals to find the most desirable worker, one of the important signals being an educational degree.

While most scholars argue that educational degrees signal something valuable, it is still up for debate what that valuable trait is (Bills, 2003). One branch of the literature, closely linked to human capital theory, states that educational credentials signal productivity enhancing skills. The argument is that individuals invest in human capital to increase their productive capacity. This enhanced productivity is desired by labour seekers and will translate into greater labour market returns. A good labour market signal is therefore inherently linked to labour productivity. Others state that education does not signal direct productivity but rather the cognitive skills of workers (Arrow, 1973). Although "cognitive qualities" are related to productivity, it is a broader term that encompasses, for example, adaptability to changes in the task profile of an occupation. A third and final line of signalling theorists argue that education signals "trainability" and therefore "potential productivity" rather than the current possession of desirable skills (Thurow, 1975). They state that employers are not screening for the most productive worker but rather the one that requires the least training costs. However, whether educational credentials signal productivity, cognitive qualities, or trainability, all versions of signalling theory argue education yields labour market returns due to the signal of desirable traits.

Empirically, already since the 1960's, a clear relationship between educational credentials as signals and income was found (Andersson & Wadensjö, 2004; Bills, 2003; Fredland & Little, 1981; Willis et al., 2019). More recently, labour market returns of education where also found in for self-employed workers (Day & Newburger, 2002; Willis et al.,

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2019), but with two important additional findings. First, labour market returns of educational credentials seem to be smaller for self-employed workers compared to workers in traditional employment (Williams, 2002). Second, labour market returns of general degrees seems to be larger among self-employed workers than more specialised vocational educational degrees (Fredland & Little, 1981). This can possibly be explained by the larger variety of tasks self-employed workers need to complete, or that the benefits of being self-employed, such as picking your own jobs and time schedule, are more valuable in the type of jobs where a general education is preferable.

Studies that examine influences of education in the online gig economy are scarce and provide mixed results. For example, taking an aggregated approach, Braesemann and colleagues (Braesemann et al., 2021) find that regional education levels strongly affect the number of jobs acquired in those regions and the average actual wages of jobs completed in those regions. In addition, Anwar and Graham (2021) use qualitative evidence to show that higher educated workers from good socio-economic backgrounds are the ones that can maintain a high platform rating and labour market returns.

On the other hand, Herrmann and colleagues (2019) examine whether educational credentials on a worker's profile correlate with the requested hourly wage presented on that profile. They find no correlation between educational credentials and requested hourly wage. Combining this with the qualitative insights from semi-structured interviews (Herrmann et al., forthcoming), their study suggests that gig workers are able to acquire the necessary skills largely outside formal educational trajectories, for example, through auto-didactic learning. Accordingly, gig workers do not have any labour market returns on their educational credentials.

Theoretically, there are important reasons to question the importance of educational credentials in such an international labour market. Aware of the institutional embeddedness of traditional skill signals such as educational degrees, online gig platforms started to provide various alternative skill signals to inform potential gig requesters (Lehdonvirta et al., 2019). The most important of these signals is the five-star rating system, which informs requesters on the quality and trustworthiness of gig workers as evaluated by previous clients. But most online gig platforms provide additional signals as well, such as skill tests that gig workers can complete to signal specific competencies (Kässi & Lehdonvirta, 2022). These platform-provided or validated signals have as a major advantage that they are institutionally embedded in the platform and therefore do not vary across countries. In addition, they are closely related to the types of jobs gig workers provide on online gig platforms, while this is not necessarily the case for educational degrees (Larke et al., 2019; Margaryan et al., 2020). While these alternative skill signals have their flaws as well, various studies show that they yield considerable labour market returns (Wood et al., 2019a; Wood & Lehdonvirta, 2021).

However, while gig requesters can rely on other quality signals than educational degrees, and while gig workers may not benefit from their education as a way to acquire relevant gig skills that enhance their productivity (as stipulated by human capital theory), educational credentials may still be beneficial as a signalling device that gig requesters

take into account. While ratings and skills tests signal performance on particular tasks and standardized skills, respectively, educational credentials signal a broader set of qualities including critical thinking, social skills and the ability to quickly acquire new skills when needed (Arrow, 1973; Golsteyn & Stenberg, 2017; Rözer & Bol, 2019). Hence, gig requesters would feel less uncertain about the gig worker's capacity to communicate, adapt and learn on the job, if necessary. We therefore hypothesize:

H1: Gig workers with any educational credentials on their platform profile acquire larger labour market returns compared to workers without any educational credentials on their profile.

H2: A higher level of educational degree is positively associated with the labour market returns of gig workers' completed gig jobs.

5.2.3 Labour Market Returns, National Institutions and Transferability of Degrees

Institutional sociology and labour economics shows that the desired qualities which correlate with an educational degree depend on the national institutional embedding of education and economies (Allmendinger, 1989; Di Stasio & Van de Werfhorst, 2016; Hall & Soskice, 2001). Here, institutions refer to the rules and conventions promulgated by formal organisations (Hall & Taylor, 1996). Although a wide variety of institutions exists in society, there are two types of institutions important for understanding labour market returns of education: educational institutions – differences in education systems – influence the supply side of the labour market, while labour market institutions – differences in rules and structures while participating in the labour market – influence the demand side.

The institutional setting in which education is completed is vital for two reasons. First, institutional structures influence what type of skills are acquired. This is true for both educational institutions and labour-market institutions. For example, education systems with a stronger vocational focus provide students with more firm- or industry- specific skills compared to students experiencing their education in a less vocational system (Bol & Van de Werfhorst, 2013b; Breen, 2005). For labour market institutions, the Varieties-of-Capitalism literature (Amable, 2003; Busemeyer & Trampusch, 2012; Hall & Soskice, 2001; Hancké et al., 2008) shows that in Liberal Market Economies education provides students with highly transferable skills, useful in a variety of employment settings, while this is not the case for Coordinated Market Economies.

Next to differences in what is learned through education, institutions also influence the type and strength of what educational degrees *signal*. National institutions shape how employers perceive education, what it brings to the organisation, and what qualities are desirable in the occupational setting. For example, Bol and Van de Werfhorst (2011) find that the signalling effect of educational credentials – the degree bonus controlled for the years of schooling – is stronger in countries with highly differentiated education systems. Higher differentiation in education systems implies a more diverse range of degrees representing different types of potential labour seekers, which increases the information degrees signal.

Independent of education systems, labour market structures also influence the signalling effect of education. Andersen and Van de Werfhorst (2010) show that higher coordination in the labour market reduces the signalling effect of education on occupational status. They state that coordination strongly influences inclusion and reduces inequalities manifested via the education system. Moreover, Di Stasio and van der Werfhorst (2016) find that the mechanism for why there is a labour market return on education is qualitatively different depending on national institutions. They find that in the Netherlands, a country with a highly stratified education system and a coordinated labour market, occupations-specific degrees are a more important predictor of labour market returns, while in England, which has a more general education system and more liberal market economy, grades are more important.

If it is the case that the skill types of workers and the related signalling strength of education depend on national institutional embedding, the question arises as to what happens when workers are hired by labour seekers embedded in different institutions than the one in which they have completed their education. In answer to this question, previous sociological research investigated the case of migrant workers who completed their education in a different country than where they are looking for work and found that the transferability of both skills and degrees is limited (Lancee & Bol, 2017). First, skills acquired via education are not always of value in different settings, where workers perform different tasks compared to similar labour providers in other countries (Ferrer et al., 2006; Zhen & Zie, 2004). This is the case because either the division of labour is different within the company, or the product that the company specialises in is different (Herrmann & Peine, 2011). Second, potential labour seekers can find it difficult to interpret the quality and skill possession that a foreign educational degree signals (Buzdugan & Halli, 2009; Damelang & Abraham, 2016). Labour seekers are often unaware of institutional structures in different countries, let alone specific degree-to-skill linkages. The limited transferability of both skills and of degrees decreases the value of educational credentials in other institutional settings (Lancee & Bol, 2017).

The extent to which institutions, both labour market institutions and education systems, are dissimilar varies between country pairs. In that sense, this dissimilarity is relative, not absolute, where countries can have relatively similar or more diverging education systems or labour market institutions. The theoretical mechanisms explaining how transferable degrees and skills are across countries would suggest that increasing differences in education systems and/or labour-market institutions would reduce the transferability of both skills and degrees. Workers from diverging countries learn more different types of skills, and it is increasingly difficult to interpret degrees from more "foreign" countries. Empirically, there is little research examining this claim. The notable exception is (Lancee & Bol, 2017), who show that the transferability of degrees, using European countries as hosts, is bigger for "Western" degrees than "non-Western" degrees, suggesting diverging institutions hampers degree transferability.

Although the online gig economy provides an appropriate setting to empirically assess the transferability of skills, due to its international dimension, it has, as far as we know, never been used as a setting in previous studies. Some studies, however, investigated the

role of location in the online gig economy. Geographical inequalities continue to persist in wage differences and hiring chances (Beerepoot & Lambregts, 2015; Lehdonvirta et al., 2021). Furthermore, domestic hirings are systematically preferred over foreign hirings, indicating a "liability of foreignness" (Hymer, 1976; Lehdonvirta et al., 2014). This could possibly be explained by the combination of a limited transferability of degrees and an unequal global distribution of demand.

Following the degree transferability literature, we expect educational degrees to have smaller returns in foreign hirings than in domestic hirings in the online gig economy since different institutions will impose a limited transferability of skills and degrees. In addition, increasing differences in institutions make it progressively harder to interpret signals from educational credentials. Therefore, we expect that among the foreign hirings, differences in education systems and labour-market institutions have a further negative effect on the labour market returns of educational credentials. Therefore, we formulate the following hypotheses:

H3: In the online gig economy, the positive relationship between the level of educational credentials and labour market returns is stronger for domestic hirings compared to foreign hirings.

H4a: In the online gig economy, the positive relationship between the level of educational credentials and labour market returns is weaker for hirings across countries with bigger differences in education systems.

H4b: In the online gig economy, the positive relationship between the level of educational credentials and labour market returns is weaker for hirings across countries with bigger differences in labour market institutions.

5.3 Method

5.3.1 Data Collection

For our analyses, we examined the reviewed work histories of gig workers on one of the largest online gig platforms worldwide. This particular online gig platform offers high-skilled digitally transferable jobs, such as programming, design, translations, and writing. It provides public information on every reviewed task completed by gig workers and additional profile information regarding the gig workers. The platform imposes only a small amount of control on the matching process: gig requesters can directly message gig workers or post a job for which workers can apply, requesters, either an individual person or a company, are free to choose which workers to hire within the set of applicants, and workers are free to put their requested hourly wage on their profile. This particular platform was chosen because it applies limited algorithmic control, it is one of the world's biggest online gig platforms, and the profile includes enough information to answer our research question.

We restricted our analyses to completed gig tasks, where both gig worker and requester

resided in one of 26 countries in the Global North. We examine workers and requesters from the following countries: Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and the United States. A scraping algorithm collected the work history and profiles between 16 and 22 December 2019. We pseudonymised the collected data to comply with GDPR requirements. The ethics review board of our university approved the data collection process. We answer our research question examining 103,362 reviewed transactions from 10,116 gig workers on the platform in question.

5.3.2 Operationalisation

Until now, studies examining labour market returns of educational credentials in the online gig economy have been scarce. One of the reasons is that it is difficult to conceptualise labour market returns in the online gig economy, since the three most commonly used indicators – occupational status, employment rates, and wages – all have their limitations in this specific labour market.

For sociologists, the preferred way to look at labour market returns is via occupational status. However, the online gig economy 'unbundles' skills away from existing occupations (Gomez Herrera et al., 2017; Horton, 2017). Workers are hired for particular tasks requiring particular skills, which can vary over their careers. Furthermore, formal classifications such as occupational labels are often not provided, since their work history will present the skills, they possess without the need of clustering these skills into occupations. Therefore, using occupational status as main study object is limited in the online gig economy.

Employment rates are also difficult to assess since online gig workers generally have the employment status of freelancers and are typically hired by varying requesters over their career. Online labour markets excel in one-time jobs and are often used by companies as a fast and flexible response to changes in demand (Woodcock & Graham, 2019). The acquirement of gig jobs can vary substantially within a gig worker's career (Cansoy et al., 2020; Schor, 2021). Therefore, it is difficult, if not impossible, to indicate when a gig worker is in 'employment' or not.

Finally, while requested hourly wages do provide important insights, they also have their limitations which can be remedied by focusing on gig workers with a longer work history (see Herrmann et al., forthcoming). As gig workers are self-employed, they are paid per task. While gig workers can present a 'requested wage' on their profile and gig requesters can indicate a general wage per task, gig workers are free to apply for any gig job, regardless of their requested hourly salary, and this indication does not need to resemble actual wages received in completed jobs. Furthermore, gig jobs can take longer, or shorter, than advertised, in which case the requested gig rate may not fully reflect the actual wage rate. To average out these effects, this makes it necessary to include only those gig workers with a longer work history. The use of data on requested hourly wage of gig workers therefore requires more focused analyses.

Instead, this study will use the **_project value_** of the gig acquired as a measurement of labour market returns, which is the total payment involved with the gig task. In the end, the project value is a particularly important indicator for freelancers since bigger projects either mean longer 'employment' or higher pay. In our dataset, the vast majority (70 percent) of the jobs were paid using US dollars. For the other jobs, we calculated their value in dollars using the exchange rate offered by the platform itself. Since this variable is highly skewed, we used log transformation before conducting our analyses, resulting in a normally distributed variable (See Appendix Figure C1).

The primary independent variable of this study is **_educational attainment_**. To measure the level of someone's educational credentials, we carefully investigated all provided educational degrees on the gig profiles collected. We classified these credentials in one of five categories: 1. Lower than a vocational degree; 2. Vocational degree; 3. Bachelor's degree; 4. Master's degree; and 5. PhD degree. Whenever an educational degree could not unambiguously be classified within a category, we removed it from our list of educational input. This concerned 2.6 percent of all individuals. Gig workers who did not include an educational trajectory that could adequately be classified were classified as having no educational degree, and therefore only included to test hypothesis 1. Since educational credentials are an ordinal variable with five categories, it can also be transformed into a continuous variable as other studies in educational research have done (Rooduijn, 2018; Rooduijn et al., 2017). Therefore, we run our analyses once with dummy variables and once with a single continuous variable. We interpret both and discuss the marginal effects of the dummies to further assess the linearity of the effects in our findings.

Our study's second important independent variable is whether a gig task was a **_domestic hiring_**. To gauge this variable, we checked the country of residence of both the gig worker and the gig requester of a completed and reviewed gig job[13]. We computed a dummy variable indicating a "1" when worker and requester resided in the same country and a "0" when they did not.

Third, operationalising the **_differences in education systems_** can be done in various ways. The sociological literature (Allmendinger, 1989; Shavit & Muller, 1998) argues that there are three institutional features among which education systems can vary: external differentiation – the extent to which different educational programmes, with a clearly understood hierarchy, exist at the same time – , standardisation - the extent to which the quality of education meets the same standards nationwide –, and vocational orientation - the extent to which education provides students with specific skills. Given the signalling perspective we use, the relevant dimension of institutional variety is the level of vocational orientation of a country's education system. According to (Bol & Van de Werfhorst, 2013b), vocational orientation has two dimensions: the prevalence of vocational enrolment and the specificity of vocational education. Since our analyses also include the individual educational credentials, we only use the second dimension as a

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13 The residing country of the gig requester was presented when the gig requester hired a worker for the task, whereas the country of residence of the gig worker was measured when data was collected. We acknowledge the possibility of gig workers moving to other countries between the completed task and the moment of data collection as a possible weakness of our study.

proxy of differences in education systems. To gauge the level of specificity of vocational education, we employed the percentage of students in upper secondary education who experiences a dual (school-based and work-based) form of education, extracted from the fourth version of the "Educational Systems Database"[14] (Bol & Van de Werfhorst, 2013b). We then took the absolute difference between the specificity of vocational education in the country of the gig worker and in the country of the gig requester, which resulted in a variable ranging between 0 and 60.

For our fourth independent variable, we follow the institutional literature (Dilli et al., 2018; Schneider & Paunescu, 2012) by using the OECD's *strictness of employment protection for individual and collective dismissals (regular contracts)* from the *"indicator of regular protection legislation"* database[15] to measure the **differences in labour market institutions**. Although gig workers are not directly impacted by this employment protection, the indicator is often used as a proxy for labour market institutions (Dilli et al., 2018; Hope & Martelli, 2019; Schneider & Paunescu, 2012; Witt & Jackson, 2016) that allows a more fine-grained examination than a typology such as the Varieties-of-Capitalism classification (Hall & Soskice, 2001). The OECD indicator includes a high variety of employment protection legislation such as the conditions for terminating employment, the involvement of third parties (such as worker councils) in dismissal procedures and the length of notice periods to be respected. It ranges from 0 (no employment protection) to 6 (highly stringent employment protection). We took the 2019's value as a proxy for labour market institutions and calculated the absolute difference to measure the difference in labour market institutions between countries. Since national institutions do not change fast or radically (Mahoney & Thelen, 2009; Thelen, 2009), we do not expect that taking one year's value will bias our results.

Furthermore, we included several control variables in our analyses. First, we controlled for the number of previously completed jobs and the average five-star rating of the gig worker at the time of hiring. Five-star ratings are highly skewed and highly positively related to the number of completed jobs. Following previous studies (Norbutas et al., 2020; Przepiorka et al., 2017), we controlled for these factors by measuring two variables: the **number of completed jobs with a five-star review** and the **number of completed jobs with a non-five-star review**. Second, we control for the amount of **offline work experience** by gauging the number of months a gig worker indicated on the profile to have a job in the traditional labour market. Since this variable was highly skewed, we log-transformed the variable. Gig workers who did not indicate their offline job experience were given the value of 0 (after log transformation), and an additional dummy was included showing whether the gig worker **indicated no traditional work experience**. Third, we included a dummy indicating whether a gig job was the first completed job of the gig worker since various studies have indicated a significant **first job penalty** on digital markets (Gandini et al., 2016; Kas et al., 2021). Fourth, the **job type** was included as a control variable since different job types typically have different wages and require different levels of skills. We

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14 The dataset used to classify education systems can be downloaded from the following webpage: http://thijsbol.com/data/

15 https://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection.htm

did so by examining the required skills needed to complete the gig job, as indicated by the gig request. The platform classifies these skills into 12 different industries, which we clustered into five broad job type categories: 1. Writing; 2. ICT; 3. Accounting related jobs; 4. Design; and 5. Other. We classified the gig job into the job type where most of the skills were classified. Whenever there was a tie, we classified the gig job into both categories. We then controlled for the job type by including five dummy variables into our models. Finally, we included the amount of **relevant skill tests presented** on the gig worker's profile. This scores can function as alternative skill signals, and are correlated with higher labour market returns (Kässi & Lehdonvirta, 2022). We classified these skill exams into five categories corresponding to the four job types presented above – excluding other – and only the skill exams relevant to the job type of the gig in question were counted. When gig jobs were classified in multiple job types, all relevant skill exams were counted. General skill exams that did not relate to a particular job type and skill exams related to basic English proficiency were included regardless of the job type of the gig in question. The descriptive statistics of the relevant variables are presented in Table 5.1.

TABLE 5.1 | Descriptive statistics.

	Range	Mean	SD
Dependent variable (N=103,362)			
Project value (Ln)	–5 – 12	4.41	1.26
Independent task variables (N=103,362)			
Number five-star reviews	0 – 944	75.69	127.03
Number non-five-star reviews	0 – 235	9.57	20.89
First gig job	0 / 1	0.08	–
Domestic gig hiring	0 / 1	0.35	–
Job type: Writing	0 / 1	0.28	–
Job type: ICT	0 / 1	0.44	–
Job type: Accounting	0 / 1	0.04	–
Job type: Design	0 / 1	0.27	–
Job type: Other	0 / 1	0.06	–
Independent worker variables (N=10,116)			
Offline experience in months	0 / 2,185	52.29	104.32
No offline experience	0 / 1	0.60	–
Number of relevant skill exams completed	0 – 5	1.05	1.30
Educational degree present	0 / 1	0.36	–
Degree: Lower than vocational	0 / 1	0.01	–
Degree: Vocational	0 / 1	0.02	–
Degree: Bachelor	0 / 1	0.19	–
Degree: Master	0 / 1	0.13	–
Degree: PhD	0 / 1	0.01	–
Country-by-country variables (N=619)			
Difference educational systems	0 – 60	17.39	16.16
Difference employment protection	0 – 4	0.82	0.67

5.3.3 Analytical Strategy

For our analyses, we estimate three multilevel random-intercept linear regression models where completed gig jobs are nested within gig workers, including requester-country and worker-country fixed effects. The first models are calculated on the entire sample of gig worker profiles. The second set limits the analyses to the gig profiles where formal educational credentials are presented, and the final models are estimated interaction effects using only the foreign hirings in our dataset. We examined possible multicollinearity problems before estimating any of our regression models by calculating the VIF scores. As shown in Appendix Table C1, no multicollinearity was detected. All non-binary independent variables are standardised, and we test our hypotheses two-sided.

5.4 Results

To test our hypotheses, Table 5.2 shows the correlates to the logarithm of project value, based on linear multilevel regression models. Model 1 shows the effect of having one or multiple educational credentials included on a worker's profile or not. The model shows a clear and significant positive effect of having educational credentials included on the project value of completed gig jobs (B = 0.052, SE = 0.023, p = 0.024). This means that including educational credentials increases the average size of gig projects a worker is hired for. Although this effect is quite small, it still holds when controlling for various other signals, such as rating, past offline experience and completed skill exams. Thus, it suggests that education is indeed meaningful as a skill signal for job requesters. Hence, hypothesis 1 is confirmed.

Models 2 and 3 show whether the level of educational degree has an influence, only comparing gig workers that presented any educational credentials. Model 2 includes educational credentials as four separate dummy variables with the lowest group ("Lower than vocational education") as the reference category, while Model 3 includes the level of education as a continuous variable to the model. Model 2 shows three of the four dummies to have a significant difference with the reference category. Presenting a Bachelor's, Master's or PhD degree on gig workers' profiles increases the average project value compared to workers with a lower than vocational degree presented on their profile. There is no significant difference in project value received between workers with a vocational degree on their profile and the reference category. However, the point estimation is positive, and when examining the marginal effects, the relationship between project value and level of educational degree is linear one (see Appendix Figure C2). As a continuous variable, the level of educational credentials has a positive significant effect on the average project value (B = 0.062, SE = 0.015, p < 0.001). Given that coefficients are standardised, we can compare the effect size of the level of education to the effect size of accumulated five-star reviews (B = 0.228, SE = 0.012, p < 0.001). This shows that the effect of education is quite small compared to the effects of reviews, as the coefficient of reviews is three to four times higher than of education. Nonetheless, the significant effect of education indicates that gig workers with higher educational degrees complete bigger

gig projects compared to gig workers with lower educational credentials. Hypothesis 2 is, therefore, confirmed as well.

In addition, the results of the control variables show some insightful results as well. First, while it is within the line of expectations that more five-star reviews would increase the project value, it is more surprising that more non-five-star reviews does not decrease project value (B = 0.022, SE = 0.012, p = 0.057). Considered the possible selection biases, since a low rating might make workers leave the platform, this could indicate that having extra experience on the platform has a bigger positive effect than the penalty of a negative rating. Second, in line with the literature on ratings (Gandini et al., 2016), we find that the first job a worker performs on the gig platform is substantially smaller compared to their further career (B = -0.323, SE = 0.024, p < 0.001). This is especially big in comparison to the other variables' effect sizes. Third, domestic hirings involve overall bigger gig projects than foreign hirings (B = 0.060, SE = 0.013, p < 0.001), indicating there is a "liability of foreignness" (Lehdonvirta et al., 2014) involved. Finally, there seems to be considerable variation in project size between the different type of jobs, where ICT and Accounting-related jobs are generally the largest and Writing tasks are the smallest.

TABLE 5.2 | Multilevel linear regression models on project value (Ln).

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Educational degree present	0.052*	(0.023)				
Educational degree: Vocational			0.151	(0.102)		
Educational degree: Bachelor			0.236**	(0.086)		
Educational degree: Master			0.299***	(0.087)		
Educational degree: PhD			0.410**	(0.127)		
Level educational degree					0.062***	(0.015)
Offline work experience months (Ln)	0.175***	(0.033)	0.127**	(0.040)	0.126**	(0.039)
No offline work experience	0.301***	(0.065)	0.193*	(0.082)	0.191*	(0.082)
Number five-star reviews	0.203***	(0.009)	0.228***	(0.012)	0.228***	(0.012)
Number non-five-star reviews	0.027**	(0.010)	0.022	(0.012)	0.022	(0.012)
First job penalty	-0.334***	(0.015)	-0.323***	(0.024)	-0.323***	(0.024)
Domestic hiring	0.071***	(0.009)	0.060***	(0.013)	0.060***	(0.013)
Number relevant skill exams	0.007	(0.009)	-0.010	(0.013)	-0.01	(0.013)
Job type: Writing	-0.125***	(0.019)	-0.113***	(0.027)	-0.113***	(0.027)
Job type: ICT	0.135***	(0.016)	0.158***	(0.023)	0.158***	(0.023)
Job type: Accounting	0.178***	(0.024)	0.162***	(0.032)	0.162***	(0.032)
Job type: Design	0.036*	(0.016)	0.032	(0.022)	0.033	(0.022)
Job type: Other	0.014	(0.016)	0.033	(0.021)	0.033	(0.021)
Country gig worker	Included		Included		Included	
Country gig requester	Included		Included		Included	
R2	.039		.038		.038	
N (workers)	10,116		3,637		3,637	
N (gig jobs)	103,362		51,454		51,454	

Note. * p < .05; ** p < .01; *** p < .001

Figure 5.1 shows the marginal effects the level of educational degree, calculated using dummy variables (Panel A) and as non-standardised continuous variable (Panel B), conditional on whether it is a foreign or domestic hiring (see for full regression results, Appendix Table 5). Panel A shows that the effect of educational credentials on labour market returns do not diminish in foreign hirings, but, if anything, shows the opposite effect. All four interaction effects show negative coefficients, of which the interaction with master's degree is significant, indicating a smaller effect for domestic hirings. The difference in project value between foreign and domestic hirings for high educated workers is practically non-existent. For vocational and lower than vocational educated workers, this difference is bigger, but so are the standard errors, probably due to the limited power. Therefore, we cannot say anything conclusive about a possible opposite effect. Nonetheless there is clearly no limited transferability of degrees among high educated gig workers. Panel B shows a stronger significant positive effect for level of educational degree for foreign hirings (B = 0.102, SE = 0.021, p < 0.001), then for domestic hirings (B = 0.053, SE = 0.022, p = 0.019). The interaction is, therefore, significant in the opposite direction as was expected (B = -0.049, SE = 0.016, p = 0.002). All in all, based on both results we reject Hypothesis 3.
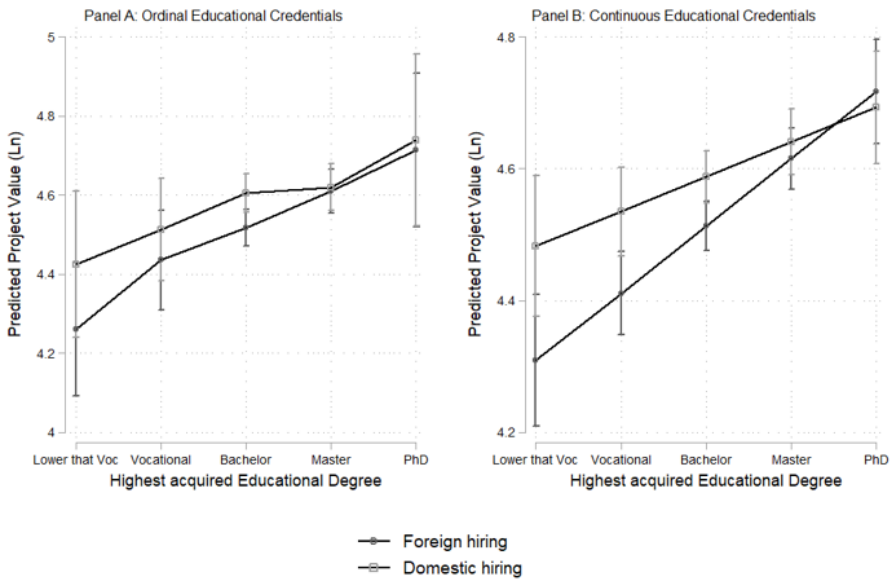
FIGURE 5.1 | Marginal Effects of Educational Degree on Project Value (Ln) for Foreign and Domestic hirings.

Our last two hypotheses states that the effect of education diminishes with increasing discrepancies in education systems and labour market institutions. Table 5.3 shows the results of the linear multilevel regression models when only foreign hirings are included. Models 1 and 2 show, unsurprisingly given the previous results, a significant positive effect of the level of education on project value among foreign hirings (Model 1: B = 0.079, SE = 0.017, p < 0.001). In addition, we find a small significant negative effect of differences

in education systems on project value (Model 1: B = -0.003, SE = 0.001, p = 0.002) and no significant direct effect of differences in employment protection (Model 1: B = -0.005, SE = 0.010, p = 0.610). In other words, hirings between countries with bigger differences in educational institutions are of a smaller value than between countries with similar educational institutions. However, the impact educational level has on the size of gig projects is not dependent on these differences in educational institutions.

The sequential models of Table 5.3 show how the effect of education is conditional on differences in education systems and labour market institutions. Models 3 shows that differences in education systems between the worker's and requester's country of residence do not change the effect of level of educational degree on the size of the completed gig jobs, showing none of the four interaction effects to be significant. Unsurprisingly, Model 4 also shows no significant interaction effect (B = 0.000, SE = 0.001, p = 0.952). A similar story can be told about labour market institutions. In Model 5, differences in employment protection between the worker's and requester's country of

TABLE 5.3 | Multilevel linear regression models on project value (Ln) of foreign hirings (Part 1).

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Level educational degree: Vocational	0.170	(0.117)			0.183	0.118
Level educational degree: Bachelor	0.304**	(0.096)			0.317**	0.097
Level educational degree: Master	0.381***	(0.097)			0.389***	0.098
Level educational degree: PhD	0.494***	(0.140)			0.510***	0.141
Level educational degree			0.079***	(0.017)		
Difference educational systems	-0.003**	(0.001)	-0.003**	(0.001)	-0.016	0.029
Difference employment protection	-0.005	(0.010)	-0.005	(0.010)	-0.005	0.010
Diff educational systems * Vocational					-0.027	0.042
Diff educational systems * Bachelor					-0.030	0.029
Diff educational systems * Master					-0.013	0.030
Diff educational systems * PhD					-0.048	0.051
Offline work experience months (Ln)	0.098*	(0.045)	0.095*	(0.045)	0.098*	0.045
No offline work experience	0.124	(0.094)	0.121	(0.094)	0.124	0.094
Number five-star reviews	0.206***	(0.014)	0.206***	(0.014)	0.206***	0.014
Number non-five-star reviews	0.011	(0.014)	0.011	(0.014)	0.011	0.014
First job penalty	-0.293***	(0.031)	-0.293***	(0.031)	-0.293***	0.031
Number relevant skill exams	-0.007	(0.015)	-0.007	(0.015)	-0.007	0.015
Job type: Writing	-0.134***	(0.033)	-0.135***	(0.033)	-0.134***	0.033
Job type: ICT	0.123***	(0.029)	0.123***	(0.029)	0.124***	0.029
Job type: Accounting	0.132**	(0.041)	0.131**	(0.041)	0.132**	0.041
Job type: Design	0.039	(0.028)	0.040	(0.028)	0.039	0.028
Job type: Other	0.038	(0.026)	0.038	(0.026)	0.038	0.026
Country gig worker	Included		Included		Included	
Country gig requester	Included		Included		Included	
R2	**.036**		**.035**		**.036**	
N (workers)	**2,785**		**2,785**		**2,785**	
N (gig jobs)	**34,216**		**34,216**		**34,216**	

*Note. * p < .05; ** p < .01; *** p < .001*

residence have also no significant effect labour market returns of educational credentials, since one out of the four interaction effects included was significant at an Alpha of .05, and no clear pattern in the coefficients could be detected. When modelling education as a continuous variable in Model 6, we find a significant interaction effect in the opposite effect of our expectations (B = 0.020, SE = 0.007, p = 0.004). This indicates labour market institutions do not reduce the signalling value of educational credentials in the online gig economy. Therefore, based on Table 5.3, we reject H4a and H4b.

TABLE 5.3 | Multilevel linear regression models on project value (Ln) of foreign hirings (Part 2).

	Model 4		Model 5		Model 6	
	B	SE	B	SE	B	SE
Level educational degree: Vocational			0.181	(0.119)		
Level educational degree: Bachelor			0.284**	(0.097)		
Level educational degree: Master			0.345***	(0.098)		
Level educational degree: PhD			0.491***	(0.144)		
Level educational degree	0.079***	(0.017)			0.050*	(0.020)
Difference educational systems	-0.003**	(0.001)	-0.037**	(0.012)	-0.003**	(0.001)
Difference employment protection	-0.004	(0.009)	-0.065	(0.036)	-0.005	(0.010)
Diff educational systems * Degree	0.000	(0.006)				
Diff employment protection * Vocational			-0.001	(0.050)		
Diff employment protection * Bachelor			0.053	(0.037)		
Diff employment protection * Master			0.086*	(0.038)		
Diff employment protection * PhD			0.027	(0.062)		
Diff employment protection * Degree					0.020**	(0.007)
Offline work experience months (Ln)	0.095*	(0.045)	0.096*	(0.045)	0.093*	(0.045)
No offline work experience	0.121	(0.094)	0.120	(0.094)	0.117	(0.094)
Number five-star reviews	0.206***	(0.014)	0.207***	(0.014)	0.206***	(0.014)
Number non-five-star reviews	0.011	(0.014)	0.011	(0.014)	0.011	(0.014)
First job penalty	-0.293***	(0.031)	-0.292***	(0.031)	-0.292***	(0.031)
Number relevant skill exams	-0.007	(0.015)	-0.007	(0.015)	-0.007	(0.015)
Job type: Writing	-0.135***	(0.033)	-0.134***	(0.033)	-0.135***	(0.033)
Job type: ICT	0.123***	(0.029)	0.123***	(0.029)	0.124***	(0.029)
Job type: Accounting	0.131**	(0.041)	0.132**	(0.041)	0.131**	(0.041)
Job type: Design	0.040	(0.028)	0.039	(0.028)	0.040	(0.028)
Job type: Other	0.038	(0.026)	0.038	(0.026)	0.038	(0.026)
Country gig worker	Included		Included		Included	
Country gig requester	Included		Included		Included	
R2	**.035**		**.035**		**.036**	
N (workers)	**2,785**		**2,785**		**2,785**	
N (gig jobs)	**34,216**		**34,216**		**34,216**	

*Note. * p < .05; ** p < .01; *** p < .001*

5.4.1 Robustness Checks

Two additional analyses were conducted to check the robustness of our results. The full regression results using the continuous operationalisation of educational credentials are presented in Appendix Tables C3 to C8. We also examined these robustness checks

on the categorical operationalisation, and they showed similar results. These results are available on request.

The first robustness check is motivated by possible omitted variables not included in our dataset, known to impact the worker's position in the labour market, most notably gender and ethnicity (Barzilay & Ben-david, 2016; Hannák et al., 2017; Kässi & Lehdonvirta, 2022; Van Tubergen et al., 2004). Therefore, we included an overall proxy for omitted variables to our models, namely the self-reported hourly wage on a worker's profile. To have a realistic range, we capped the requested wage at a maximum of 100 Dollars per hour. Appendix Tables C3 to C5 show the results of our main models, with self-reported hourly wage included. Although the proxy systematically has a significant effect on project value, it hardly changes the coefficients and significance levels of other variables. The conclusions regarding our hypotheses thus remain unchanged.

Second, on the platform examined in this study, labour providers can present themselves as self-employed individuals, but also as a company or worker collective. The direct signalling of educational credentials could be biased when workers do not present themselves as individuals that acquired those educational credentials. Therefore, as a robustness check, we re-do the models with only labour providers that present themselves as individual self-employed workers on the platform. Since, the platform does not classify workers as individuals or companies, we used text analyses on the descriptive profile page, to assess whether a worker is talking about him/herself as an individual ("I") or as a collective ("We"). Using this method, we identified sixty per cent of the profiles unambiguously as individual workers using "I" and not using "we". Appendix Tables C6 to C8 show the regression results based on this subset of observations. No major changes in the results were found and conclusions regarding hypotheses remain intact.

5.5 Conclusion

This study examines the labour market returns and cross-country transferability of educational credentials in the online gig economy of the Global North. It is well-known that national education and labour-market institutions affect workers' labour market returns of educational credentials (Andersen & Van de Werfhorst, 2010; Di Stasio & Van de Werfhorst, 2016; Shavit & Muller, 1998). In addition, the migration literature highlights that the transferability of those credentials between countries with different institutions is limited (Lancee & Bol, 2017; Storen & Wiers-Jenssen, 2010). The rise of the online gig economy, where services are traded online, raises the question of whether educational attainment will still provide labour-market returns when labour markets are institutionalised as a global online platform and national structures circumvented (Berg & De Stefano, 2018; Grabher & van Tuijl, 2020). Furthermore, it allows us to examine the role of different education systems and labour-market institutions in valuing nationally institutionalised quality credentials, such as education. We study these questions by reviewing 103,362 gig jobs completed by workers from the Global North on one of the biggest online gig platforms worldwide.

Consistent with previous labour market studies, we find that educational credentials offer labour market returns for the volume of gig projects transacted. This effect also holds when controlled for alternative quality signals, such as skill exams (Kässi & Lehdonvirta, 2022) and rating systems (Herrmann et al., 2019; Wood et al., 2019a; Wood & Lehdonvirta, 2021). Importantly, though, the effect sizes of education are relatively modest compared to the number of five-star reviews accumulated over time. Furthermore, when comparing the different educational groups separately, we do not find that workers with a vocational degree get more labour market returns compared to workers with a lower than vocational degree, while the higher education groups – Bachelor, Master and PhD – do acquire bigger labour market returns. The null effect of vocational education might be explained by that the online gig economy removes occupational titles (Gomez Herrera et al., 2017), while the signalling value of vocational degrees is closely linked to such occupations.

The persistence of labour market returns in relation to the volume of gig projects could mean that alternative skill signals might be insufficient in capturing all relevant skills that education signals. This is especially plausible considering that educational credentials signal more tacit qualities, such as cognitive capabilities (Arrow, 1973) and trainability (Thurow, 1975). Requesters searching for interpretable ques will unavoidably resort to interpreting education, even when they cannot completely interpret the signal.

This is particularly interesting in light of previous studies. (Braesemann et al., 2021) find that, at the aggregate level of regions, higher educated regions acquire more gig jobs and accumulate a higher perceived hourly wage. We also find that, at the individual level, the size of the gig projects is bigger for workers with a higher education degree. Furthermore, Herrmann and colleagues (2019) find that, for gig workers, higher educational credentials do not lead to higher labour market returns in terms of higher hourly wages requested. However, we find that educational credentials hold labour market returns in terms of acquiring larger projects. This may indicate that workers do not fully leverage their educational credentials when requesting a particular wage, or that requesters consider higher education to signal desirable traits other than gig specific skills. Accordingly, our findings highlight how education credentials have different impacts depending on the indicator of labour market success chosen (requested wage vs. project size) and the perspective taken (worker vs. requester).

The second main result in this study is that labour market returns for higher educated workers seem to be uniform, independent of whether the hiring is international or from the same country, showing transferability of higher education credentials in the online gig economy. However, the same cannot be said for vocationally trained workers. Among those workers, foreign gig jobs are of lower value than domestic jobs. In other words, the transferability of degrees seems to be smaller for vocational credentials than for higher general credentials in the online gig economy. These results are in line with existing literature on labour market returns of educational credentials among self-employed workers, which indicates larger labour market returns for higher general education due to the diverse settings self-employed workers encounter (Fredland & Little, 1981).

If we look more specifically at institutional differences, we do not find any evidence that greater differences, neither in education systems nor in labour market institutions, hurt the signalling value that workers' educational degrees have for gig requesters. Among foreign hirings, differences in education systems, the level of vocational specificity, and differences in labour market institutions, employment protection, does not impact the signalling value of educational credentials for acquiring projects of bigger monetary value in the online gig economy. This rather surprising result suggests that online gig platforms successfully alleviate increased insecurity due to different institutions (Beugelsdijk et al., 2004; De Groot et al., 2004), among foreign hirings.

There are, at least, three possible explanations for the persistent importance of higher educational credentials for gig requesters in foreign hirings and across different institutions with regard to the volume of transactions. The first explanation suggests that credentials acquired at higher education institutions provide a better interpretable signal across countries, as such credentials signal more general skills (Brunello & Rocco, 2017). As skills are more general, they can be adapted to different contexts and across different institutional national settings, while this is not the case for more specialised skills.

The second possible explanation is that higher education maintains their signalling value across institutional contexts because higher education degrees are standardised in the Global North via the Bologna Process (Huisman et al., 2012). This standardisation improves the interpretability of the signal, thereby making it more tempting for requesters to resort to education as a signal.

The last explanation holds that, due to cross-country hirings and institutional dissimilarity, education might lose its signalling value for what regards particular skills, but remains an essential cue as a "positional good" (Di Stasio et al., 2016; Ultee, 1980; Van de Werfhorst, 2011; Weiss, 1995). The positional good perspective argues that it is not the absolute value of education in terms of skills or productivity that matters but only its level compared to competitors. Although requesters likely do not understand what skills an unknown educational credential has screened or taught a worker, it is reasonable to argue that a requester can figure out with minimal effort whether an educational degree is in the higher or lower tier of their institutional setting. Requesters, all else equal, would hire a worker with a higher level of degree because of their implicit assumption that those workers are "better". Higher education remains important in foreign trade because there are relatively few higher educated workers. Or putting it differently, for workers to get first in line with a lower educational degree, they need to rely on other preferable characteristics, such as being a domestic worker (Lehdonvirta et al., 2021).

Several limitations of this study should be acknowledged. First, one of the main limitations of using real-life behavioural data is that they come with selection effects. It is impossible to interpret our results on the labour market returns of education without reflecting on three possible biases in our data: 1. Gig workers that did not use this platform (probably more low-educated workers, making the range of educational level rather skewed); 2. Gig workers that never acquire a project; and 3. Gig workers who operate as middlemen

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and sub-contract their obtained work immediately on an online gig platform for a lower project value. These selection effects probably imply that our study gives a rather conservative estimation of labour market returns on education. Second, our study provides a conservative estimation of the effect of institutional differences since it is limited to examining gig workers in the Global North. Therefore, our results should be interpreted given our country selection in mind, and we encourage future research to examine labour market returns in a more global setting. Third, the use of educational credentials presented on gig profiles comes with some limitations. One limitation is that some workers (2.6 percent) did not accurately report it. And for those with accurate reports, we recorded these at the time of the data collection, while taking into account all transactions completed before that moment in time. Changes over time in the reporting of educational credentials on the profile could thus not be considered. Finally, our study examines the level of educational degree, without looking at horizontal matching (Van de Werfhorst, 2011; Wolbers, 2003). The reason for this is that the online gig economy, as mentioned before, 'unbundles' skills and removes occupational titles (Gomez Herrera et al., 2017), making it difficult to examine whether the field of study matches particular gig jobs.

All in all, this study shows that the value of educational credentials in changing labour markets is more resilient than hitherto expected. It demonstrates that while online gig platforms often successfully circumvent national labour regulations, national institutions still impact their workers' position, albeit indirectly. This also means that existing global inequalities are likely to be reproduced on online gig platforms. Although they might lower entry barriers, success and stability still depend on the same characteristics as in the old structures. Therefore, the liberating effect for marginalised communities that online gig platforms often claim to have might be overstated.

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Conclusion

This dissertation takes a socio-economic and institutional perspective on the online high-skill gig economy. Online platforms that facilitate the trade of digital services are arguably the closest that society has come to a global labour market since the digital nature of this kind of labour may make locality obsolete (Graham & Anwar, 2019). Therefore, such platforms often present themselves as a force that lowers entry barriers to markets (Anwar & Graham, 2021), liberators of rigid market structures, and facilitators of existing entrepreneurial spirit (Ravenelle, 2017). They highlight the compositional differences when confronted with the emerging criticism regarding the low-skilled gig economy. The argument given states that high-skilled gig workers have scarce skills, which grants them more bargaining power. Therefore, higher regulation would not protect them but, instead, limit their true potential.

In practice, online gig economy platforms provide alternative institutions by taking the position of a "neutral" authority, imposing their own terms and conditions unilaterally, and being the main judicator of disputes (Frenken & Fuenfschilling, 2020; Vallas & Schor, 2020). In that sense, they provide an alternative market structure that is homogeneous across countries. This alternative structure challenges conventional existing national regulatory forces (Boudreau & Hagiu, 2009), such as national labour market regulation, and institutionalised political interest, such as trade unions and other forms of collective action (Walker et al., 2021).

Although online gig platforms create these new institutions circumventing traditional ones, the gig workers offering their services still depend on the functioning of traditional institutions. The high-skill nature of the traded tasks requires workers to be trained and skills to be signalled to potential requesters. In traditional markets, national institutions facilitate necessary training and signalling via national education systems and educational credentials (Bills, 2003; Busemeyer & Trampusch, 2012). This creates a paradoxical relationship between institutions and platforms. On the one hand, high-skill online gig platforms bypass national institutions, while on the other hand, they rely on their functioning.

This dissertation tries to give insight into this discrepancy. It assesses whether national institutions can still influence workers' positions in the high skilled online gig economy in the Global North. The focus is not on direct regulatory influence but the indirect impact via skills and training. Accordingly, the thesis tries to explain why, even on these platforms, global inequalities persist in terms of perceived wages and the monetary volume of required projects (Beerepoot & Lambregts, 2015; Lehdonvirta et al., 2014).

In this concluding chapter, I assess whether and how substantial the indirect influence of national institutions is on the high-skill online gig economy. In the next section, I discuss the main findings of the separate studies. I interpret these considering the broader literature related to the respective research questions. Next, I discuss what insights this dissertation provides to the literature on national institutional systems and the literature examining the high-skill online gig economy. I conclude with some suggestions for further interesting research directions.

6.1 Main Findings

Before examining the influence of national institutions on the high-skill online gig economy, I focus on the conceptual question of how to define the gig economy – see Chapter 2. I show that the gig economy can narrowly be described as "ex-ante specified, paid tasks carried out by independent contractors mediated by online platforms". However, the boundaries of the gig economy concept are contingent on regulatory and analytical decisions involving the four key features: (1) does the gig economy only involve independent contractors or also workers in other employment relations?; (2) does the gig economy only involve paid services or also unpaid labour?; (3) is the gig economy limited to service transactions or does it also involve trade in sharing of goods?; and (4) is the gig economy limited to online intermediaries involvement or does it also include offline intermediaries? Choices made along these four dimensions are vital for what is considered the gig economy and depend on the phenomenon one wants to analyse.

Given the research question of this dissertation, a narrow definition of the gig economy is adopted in all chapters. Since the focus is on international markets, the aspect of online intermediation is vital for this dissertation. Furthermore, the focus on skills, education and labour position justifies the exclusion of both unpaid work and trade in goods. That leaves the legal classification of the worker. In the following studies, I examine an online platform that does not employ the workers active on it. However, it could be the case that workers are not employed by the platform but by a company that offers its services on the platform. In principle, this is possible: companies employing their own workers can offer their services on this platform. However, exploratory search in this dissertation shows that most providers act as independent contractors, and the group of corporate gig providers– either with employed workers or being solo-self-employed but presenting themselves as a company – is relatively marginal[16].

In Chapter 3, I examine whether there are national differences in trade in the high-skill online gig economy in the Global North. Focusing on Europe, the findings show that geographical proximity still strongly influences cross-country trading behaviour, even in the high-skill online gig economy. Furthermore, I find a strong "home country bias", meaning people prefer to hire someone from their own country. In addition, I find that a shared language increases hiring between countries. The results also indicate a strong off-shoring effect, showing significant hiring from high-wage countries to lower-wage countries, even within Europe. However, surprisingly, regulatory institutions and national cultural norms did not affect hiring patterns between countries. Overall, the results indicate that while high-skill online gig platforms successfully circumvent national regulation, this does not mean they create a global labour market. Geographical differences are persistent, suggesting a more indirect influence of national institutions.

In the following two chapters, I try to explain why these international differences endure.

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16 In the fifth chapter, I robustness check was conducted with only examining worker profiles that could unambiguously be classified as individual workers. Of the sample, less than 3% of the gig profiles could be classified as corporate gig profiles.

Chapter 4 presents a study on the skill specialisation of workers. Based on institutional theories on labour markets and educational systems, it is evident that workers are trained in different skills across countries in the Global North. In traditional offline labour markets, countries with a more protected labour market and a more vocationally oriented education system train their workers to possess more specific skills. This chapter shows that this is not the case for workers in the high-skill online gig economy, even finding weak evidence for the opposite. While their individual education still weakly predicts what type of skills workers present on the platform, the national institutions do not predict skill offering in the way it was expected. Instead, I found a weak indication of a correlation in the opposite direction. This suggests a substitution effect, meaning that workers with skills incongruent with what is expected and valued in their national labour market move to online gig platforms.

In Chapter 5, I consider another explanation for geographical differences: the transferability of degrees and skills. This study is based on the notion that the type of labour market institutions and educational systems influence what type of skills workers acquire and *signal* with their educational credentials. Both the signalling value and the applicability of acquired skills diminish when labour crosses national borders. If the transferability of degrees is severely hampered, this could explain why requesters prefer workers with domestic degrees or, at least, with degrees obtained in institutionally proximate settings. However, before I could assess the transferability of degrees, I needed to reaffirm the economic value of a degree in the context of high-skill online gig platforms. These platforms provide alternative quality signals that are not institutionally embedded, such as the rating system, and promote an informal learning culture (Margaryan et al., 2020). Therefore, Herrmann and colleagues (2019) have suggested that educational credentials do not have value in this new economy. I show in this chapter that educational credentials still hold labour market returns in the high-skill online gig economy, although substantially lower than expected from the existing literature on offline labour markets. Furthermore, I find that the transferability of degrees is still present, especially for higher academic degrees.

What does that tell us about the indirect influence of national institutions on workers' positions in the high-skill online gig economy? The answer to this question is, perhaps unsurprisingly, somewhat nuanced. On the one hand, the high-skill online gig economy seems less disruptive and revolutionary as sometimes portrayed. Where academics and pundits argued certain national institutions would become obsolete, leading to a "death of distance (Cairncross, 2000) and creating a "level playing field" (T. L. Friedman, 2005), I find that international inequalities endure even in a homogeneous region such as Europe or the "Global North". Furthermore, formal skill acquirement and/or signalling via education continue to be important, both in the type of skills that workers present and how the skill is valued.

On the other hand, these institutional influences, such as educational credentials, occupational closure and labour market structures, used to dominate labour market stratification processes in traditional labour markets. In the high-skill online gig

economy, these traditional ways of national institutions' influence have only a marginal explanatory power on workers' positions. In that sense, the high-skill online gig economy indeed changes national institutions' role in labour market inequalities. Furthermore, the results of this dissertation show that the primary influence of those national institutions is mediated by the level of the individual worker. Where macro-level educational systems do not influence the online gig economy, individual workers' educational credentials remain important. And where macro-level labour market structures hardly predict economic behaviour in the online gig economy, individual tenure on the platform continues to hold explanatory power.

The lack of explanatory power of macro-level institutions also suggests a possible substitution effect between the traditional labour market and the high-skill online gig economy. The high-skill online gig economy poses a distinct labour market, where only a particular type of worker is active, and it functions by partly different rules. Institutional dissimilarity does not create more ambiguity on workers' abilities because skill exams, rating systems and profile information in general already show a clear picture of the worker's qualities. In that sense, online gig platforms are successful in what they claim to do, namely reducing search costs and information asymmetries. National institutional "restrictions" are partially circumvented, shifting the level at which institutionalisation takes place away from the macro-level of national states towards the micro-level on the online gig platform.

The lack of institutional influence at the macro level should be put in a historical political perspective. The change of these macro-level direct effects of national institutions is not only due to changing economic forces but also the result of political choices. High-skill online gig platforms seized the opportunity to provide alternative structures that shifting the institutionalisation of markets largely outside nations' sphere of influence (Boudreau & Hagiu, 2009; Frenken & Fuenfschilling, 2020; Grabher & van Tuijl, 2020). However, this could only happen as those same institutional forces provided the platforms with the necessary opportunity to this end. It was political action, or rather inaction via liberalisation and allowing collective action groups to lose influence (Woodcock & Graham, 2019), that created the opportunity for platforms to assert their own infrastructure challenging existing institutions.

However, that national institutions allowed platforms to create alternative structures does not mean there cannot be any regulatory and governmental control of the high-skill online gig economy (Lehdonvirta, 2022). The fight over influence, worker protection and economic justice in the high-skill online gig economy is not a lost cause. There are at least three ways in which the negative excesses of the online gig economy could be regulated, despite its highly global nature. First, this dissertation shows that national institutions still impact labour market stratification in various ways by providing a well-trained and educated workforce. High-skill online gig platforms depend on this investment in national workforces, and this is, therefore, where the leverage of national institutions lies. National governmental institutions could, if deemed desirable, take a confrontational approach demanding oversight to obey national worker regulations. There is precedent

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involving nations demanding policy of tech companies ranging from India regulating WhatsApp (Kalra & Phartiyal, 2021) to Turkey regulating social media platforms (Yackley, 2021). Important to note that perceived legitimacy is vital for such a regulation's success, and substantial economic and political risks are involved in this confrontational stance. Yet, asserting national influence is something nation states in the Global North can do if they deem it desirable.

A second way to monitor a market that circumvents national institutions is by changing the level of regulation to the supranational level. Regulation can be possibly imposed via organisations such as the United Nations, but it can also manifest multilateral or via organisations such as the European Union. Important here is that the regulation can be enforced, and the agreement involves enough countries of substantial economic importance to counterbalance the power of online gig platforms. The European Union has shown, via the creation of data protection regulations such as the GDPR, that they can regulate global infrastructure companies to counter the adverse effects of these companies (also known as the "Brussels effect").

Finally, where the first two options mainly focus on formal and regulatory institutions, informal norms and the platform's reputation can also provide a controlling mechanism for online gig platforms. Currently, online gig economy platforms use ratings and reputations to institutionalise workers and requesters, but this mechanism can also be reversed. Countries or interest groups can structure values they find essential to uphold on online gig platforms and check which platforms actively promote those values. More concretely, governments can blacklist specific platforms or create endorsements and "good practice" labels. One example such informal institutions is the FairWork project, instigated by the Oxford Internet Institute (Graham & Woodcock, 2018). Countries or supranational organisations could use the logic on which the FairWork project is based to extend it to uphold a variety of values and practices that are deemed desirable by political actors.

6.2 Contribution to the Institutional Literature

Until now, institutionalist scholars of the gig economy have focused on its on-site, geographically bounded parts (Koutsimpogiorgos et al., 2020; Punt et al., 2021; Seidl, 2022; Thelen, 2018). However, the increasingly international dimension of online platforms, especially when transacting digital services, is underexplored. This dissertation addresses this research gap by making two main contributions.

First, platforms can, fairly successfully, create their own institutional infrastructure, circumventing some ways in which national institutions used to influence labour market functioning. This dissertation shows that the national institutional structures which predict gig workers' behaviour and capabilities are of little importance in three ways. Chapter 3 demonstrates that differences in regulatory settings and educational systems do not impact the cross-country hiring behaviour between European countries in the high-skill online gig economy. Chapter 4 shows on the individual level that macro-level

national institutions do not define the type of skills offered on online gig platforms similar to their influence in offline labour markets. National education systems and labour market regulation predict the specificity of skills offered in the online gig economy only weakly and in the opposite direction as expected. This potential substitution effect would mean a weaker direct impact of these institutions, via a selection instead of training influence. Finally, institutional dissimilarity does not limit the "transferability of degrees" suggesting that the way how institutions shape the educational system is less relevant. Labour market returns of educational credentials are not smaller among foreign hirings compared to domestic hirings, nor are they smaller among foreign hirings between countries with increasing institutional dissimilarity. While the value of individual skills and educational degrees is reaffirmed in this dissertation, the impact of educational and labour market structures is non-existent.

The diminishing value of macro-level institutional indicators asks for a re-evaluation of traditional institutional theories regarding the high-skill online gig economy. Since national institutions seem to influence labour market stratification differently in the online gig economy than traditional labour markets, a reflection on the applicability of existing labour market theories is needed. However, it is also important not to conclude that online gig economy operates in an "institutional void" (Elert & Henrekson, 2016). The persistent importance of geographical locality, the impact of crossing a border on hiring patterns, and the value of educational degrees, all show that such a conclusion would lack important nuance. Instead, adapting traditional theories to the international digital sphere is necessary. While this dissertation does not give an all-compassing answer to which national institutions matter, it does show that they do.

Second, I present some critical insight into the institution of educational credentials. These insights are rather two-sided: On the one hand, the explanatory power of educational credentials is a lot weaker in the online gig economy than would be expected from the traditional labour market literature (Bills, 2003; Bol & Van de Werfhorst, 2011). The relatively weak influence of educational credentials has at least two possible explanations relevant to the institutional literature. First, online gig economy platforms reduce the degree to which occupational closure can be instituted to acquire economic rents (Bol & Weeden, 2014; Solga & Konietzka, 1999). Although labour providers are allowed, and even encouraged, to present their educational credentials on their profile, there is no gatekeeping based on these credentials, and the direct link between educational degree and type of gig is not always evident. Second, it suggests that alternative skill indicators, such as the rating system and skill exams, can partially replace educational credentials as a skill signal. Given that they are not only presented by the platform but also verified (rating systems) or generated (skill exams and the number of completed jobs), these quality signals are deemed to be of higher quality (Lehdonvirta et al., 2019). The fact that those tools are not nationally embedded creates an advantage since they can be interpreted effectively across institutional settings.

On the other hand, credentials keep explanatory power regarding labour market returns and the type of skills workers offer. This shows that there are valued traits related to educational credentials that those platform-generated attributes cannot capture. That

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this impact is universal, independent of differences in education systems, suggests that this does not relate to specific institutionally embedded skills but rather general cognitive qualities or even non-skill-related characteristics (M. Jackson, 2006; Lleras, 2008). Therefore, this dissertation shows that the value of educational credentials, even in a global setting, is partly skill- and productivity-related – which alternative skill signals can mainly capture – but partially not. Furthermore, it shows that enhancing the population's educational level is still a successful impact national institutions can exert on the labour market position of the residing labour providers.

6.3 Contribution to the Gig Economy Literature

When this thesis project started in 2018, the gig economy literature was much less developed. Empirical data was scarce, and most research on the gig economy focused on "Uber and Deliveroo" (Frenken & Van Slageren, 2018). In this dissertation, I have synthesised the semantic debate surrounding the gig economy and developed a conceptual framework that can be used analytically to link a precise gig economy definition to a studied phenomenon. Understanding what is and isn't part of a phenomenon is vital to accumulating and integrating different empirical findings. It also helps to highlight the fundamental regulatory and socio-economic questions relevant to the gig economy. In comparing the gig economy and what was there before, it is important to understand how the gig economy conceptually differs from the previous situation.

Second, this dissertation partly reaffirms the notion of online platforms "circumventing" labour market regulation and structures (Aloisi, 2015; Gomez Herrera et al., 2017; Lehdonvirta et al., 2019). Regulatory regimes do not seem to predict hiring patterns in the online gig economy. However, this does not create a "level playing field", as sometimes discussed. The significance of national institutions is broader than the often examined regulatory setting (Berg & De Stefano, 2018; Seidl, 2022): geographical distance and home market bias remain important and geographical inequalities may endure even, or perhaps especially, in the absence of regulation. In addition, traditional stratification still manifests to some extent in the high-skill online gig economy: educational degrees predict the type of skills presented and (partially) labour market returns received. In that sense, this dissertation demonstrates the two-sided nature of "lowering entry barriers". Online gig platforms do evidently allow workers to enter the market without entry certificates, such as educational credentials. In that sense, they lower entry barriers and allow marginalised communities to participate. Yet, labour market stratification is still partly manifested via those credentials, which means the "losers" of the labour market competition are largely the same as in the traditional setting. This begs the question of whether entry barriers are lowered in practice: marginalised people can create an account but might fail to get any income due to the same reasons they left the traditional market, namely the lack of any educational credentials or their negatively perceived geographical location.

6.4 Limitations

Despite these substantive, theoretical, and methodological contributions, this dissertation also suffers from several shortcomings that need to be considered. The first limitation of this dissertation involves the type of data gathered. As mentioned in the introduction of this thesis, the deliberate choice was made to use online data to assess the structural and behavioural setting of the high-skill online gig economy. This data is, therefore, vast, with a large sample and involving workers across many countries. However, it is also incomplete and superficial: Incomplete, since workers do not fill in their profile to help researchers examine a research question but rather to present themselves to potential requesters. This means that the data is biased due to mistakes, such as typos, and deliberate intention, like false advertising. It is also superficial since it misses information on the subjective perspective of workers, the rationale for making decisions and information that is strategically irrelevant but scientifically interesting. The choice for focussing on this particular methodology limited the research questions that could be asked. Future research should combine (online) behavioural data) with substantive generalisable surveys to fill this research gap (e.g. Hofstra, 2017).

Second, the studies in this dissertation had a clear geographical scope, namely the Global North. However, a more global perspective is vital to truly examine the international facets of the online gig economy. When taking a global perspective, the role of geography could be better assessed, including numerous factors dependent on geography (such as time zones). Not only global data is needed, but also global theory: this dissertation limited the scope to the Global North due to a lack of institutional theory on capitalist structures and national educational systems analytically on a worldwide scale. The result is that this dissertation only studies a subset of the workers active in the high-skill online gig economy; therefore, the results should be interpreted as such.

A third limitation of this study is the unclear influence of algorithmic management. In this dissertation, an online platform with the least amount of algorithmic control over the matching process was chosen to come closest to the unbiased behavioural dynamics on such a platform. However, that algorithmic management impacts behaviour in the gig economy is undeniable (Rahman, 2021; Wood et al., 2019a). This is not a limitation per se, since this dissertation examines the high-skill online gig economy as a phenomenon, and that phenomenon is partly a product of those algorithms. The limitation, however, is that how these algorithms influence behaviour is still largely unknown. Therefore, knowing how generalisable our results are across platforms with different algorithmic structures is also unclear. I encourage scholars to re-evaluate the chapters of this dissertation across platforms to truly assess its universality.

Finally, the active base of high-skill online gig platforms is not stable over time: there is a selection on which people enter and who leave a market. Especially that later groups pose a limitation to our studies since we know that leaving a platform is endogenous to success in that given market: gig providers with bad ratings have a higher chance of leaving a platform market (Norbutas et al., 2020; Teubner & Glaser, 2018). This selection

effect reduces the variance within a platform on several factors, limiting it to the subset of characteristics. In practice, this means an underestimation of the gauged individual effects.

6.5 Future Research

The first direction future research should focus on is to better assess the influence of algorithmic management on human behaviour on high-skill online gig platforms. Most importantly, algorithmic management is not a monolith but varies across platforms and instances (Duggan et al., 2020). Often, the current comparison taken is that of algorithmic management (e.g., via platforms) versus no algorithmic management. However, what is lacking is studies looking at various kinds of algorithmic management structures, for example, comparing platforms that facilitate similar types of gig jobs. Although not all forms of algorithmic management can be examined this way – as far as I know, all the gig platforms use a five-star rating system – the varying algorithmic tools could be assessed on their impact and whether they alleviate or re-enforce inequalities.

Future studies on algorithms should not be limited to efficiency-based "meritocratic" inequalities. Algorithms are not neutral and, therefore, can strengthen and even legitimise existing human bias (Kas et al., 2021; O' Neil, 2016). In contrast, a lot of the national regulation is designed to limit these kinds of biases via, for example, anti-discrimination laws. Where this dissertation concentrated the scope on skills and quality signals, future research should broaden that scope to ethnic, gender and socio-economic discrimination.

A second direction future research should take is to compare existing knowledge with the baseline group in traditional labour markets to assess the impact of gig platforms. This dissertation could examine internal institutional influences but could only speculate on the magnitude since no comparative design was chosen. In future research, two types of comparisons should be particularly insightful. First, findings in the online gig economy should be compared to the offline occupational group that completes similar tasks. In the case of this dissertation, this would be comparing the high-skill online gig economy to ICT workers, designers and translators who are registered as solo self-employed. By making this comparison, keeping legal qualifications and type of occupational job constant, it is possible to see how the advent of a gig platform, with its algorithmic management, digitalisation, and internationalisation, changes the situation of workers in the labour market. Via this comparison, a qualitative interpretation could be given to found effects in this dissertation, such as the significant labour markets returns of education (chapter 5), or the predictive power of educational degree on offered skills (chapter 4). Second, a comparison should be made with companies specialising in similar occupational tasks that provide their services online or on a platform. In that way, the effect of a weakened labour position with more insecurity could be examined while keeping the occupational profile and digitalisation constant. By making both these comparisons, it will be possible to disentangle the flexibilisation and digitalisation impact and to assess the realistic effect of gig platforms. Thereby, it will be possible to assess not only how fragile the

position of gig workers is on gig platforms but whether gig platforms create a weaker position for gig providers compared to other possible situations. While this dissertation did not directly focus on this weakened labour position, it would link well to existing studies showing a downwards spiral of quality of work and wages in the high-skill online gig economy (e.g. Rözer et al., 2021).

Third, new studies should extend their scope to the diverse Global South. The advent of online gig platforms has demonstrated the need for a global examination of institutions, labour market stratification and inequalities. The substantive data gathered by institutions such as the OECD and World Bank make international comparisons better possible. However, there is still a lack of comprehensive institutional theory that could explain empirical differences on a global scale. Therefore, future research must invest in increasing global empirical institutional indicators while simultaneously developing global institutional frameworks. By doing so, studies could extend the scope of this dissertation by examining not only a potential "death of distance" (Cairncross, 2000) within Europe, but also at the global level.

A final direction future research can take relates to collective responses to the (online) gig economy. This can manifest in several ways, such as creating gig worker unions, platform worker coops or digital professional associations. Both digitalisation and flexibilisation facilitate these "de-commodifying forces." Increasing flexibilisation puts certain groups of workers in a precarious position where the algorithmic structure, lack of educational credentials or unwanted set of offered skills can keep them in a position of low income and high work pressure. Digitalisation, on the other hand, creates the opportunity to mobilise and connect geographically dispersed occupational groups relatively easily. Future research should examine to what extent these collective responses solve possible perils caused by the gig economy (Schor, 2020) and what stops them from becoming the dominant organisational form (Bunders, 2021; Bunders & Akkerman, 2022; Wood et al., 2019b).

6

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APPENDICES

Appendix A

TABLE A1 | VIF scores.

	VIF
Wage Difference (Ln)	1.423
Geographical Distance (Ln)	1.750
Vocational Education Difference (Ln)	1.335
Difference STEM graduates (Ln)	1.178
Home Country Bias	2.885
Difference Institutional Quality (Ln)	1.705
Difference Trust (Ln)	1.730
Difference Respect (Ln)	1.752
Difference Control (Ln)	1.350
Difference Obedience (Ln)	1.367
Common Language	1.969
Total Money inflow (Ln)	1.221
Total Money outflow (Ln)	1.122
Employment Protection Difference (Ln)	1.515
Difference National Social Dialogue (Ln)	1.598

TABLE A2 | Regression models predicting the number of hiring transactions (negative binomial) and total money flow (linear regression) between two countries (directed) with geographical distance of biggest agglomerations.

	Transactions		Money flow	
	OR	SE	OR	SE
Wage Difference (Ln)	1.386***	(0.085)	1.640*	(0.230)
Geographical Distance Agglomerations (Ln)	0.763***	(0.043)	0.724**	(0.123)
Vocational Education Difference (Ln)	1.000	(0.028)	1.017	(0.074)
Difference STEM graduates (Ln)	1.136**	(0.048)	0.983	(0.142)
Home Country Bias	2.827***	(0.219)	3.510*	(0.542)
Difference Institutional Quality (Ln)	1.018	(0.162)	0.797	(0.444)
Difference Trust (Ln)	1.047	(0.029)	1.069	(0.086)
Difference Respect (Ln)	1.025	(0.031)	1.035	(0.082)
Difference Control (Ln)	0.940	(0.043)	0.941	(0.115)
Difference Obedience (Ln)	0.968	(0.031)	0.954	(0.077)
Common Language	1.550**	(0.139)	1.635	(0.323)
Mass Freelancer Country (Ln)	2.339***	(0.019)	2.901***	(0.037)
Mass Requester Country (Ln)	2.334***	(0.021)	3.230***	(0.053)
Employment Protection Difference (Ln)	0.945	(0.095)	0.799	(0.247)
Difference National Social Dialogue (Ln)	1.185*	(0.074)	1.684*	(0.155)
Intercept	0.000***	(0.509)	0.000***	(1.383)
Adjusted R2	0.279		0.707	
Theta	5.269***			
2 X Log Likelihood	-4176.333			
AIC	4210.3			

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

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TABLE A3 | Regression models predicting the number of hiring transactions (negative binomial) and total money flow (linear regression) between two countries (directed) with contiguity.

	Transactions		Money flow	
	OR	*SE*	*OR*	*SE*
Wage Difference (Ln)	1.395***	(0.085)	1.638*	(0.238)
Geographical Contiguity	1.415***	(0.088)	2.098***	(0.220)
Vocational Education Difference (Ln)	0.997	(0.030)	1.010	(0.075)
Difference STEM graduates (Ln)	1.117*	(0.049)	0.992	(0.144)
Home Country Bias	4.912***	(0.223)	8.899***	(0.579)
Difference Institutional Quality (Ln)	0.953	(0.162)	0.791	(0.409)
Difference Trust (Ln)	1.053	(0.030)	1.080	(0.086)
Difference Respect (Ln)	0.987	(0.032)	0.999	(0.082)
Difference Control (Ln)	0.947	(0.046)	0.959	(0.112)
Difference Obedience (Ln)	0.968	(0.029)	0.955	(0.078)
Common Language	1.471**	(0.127)	1.380	(0.350)
Mass Freelancer Country (Ln)	2.295***	(0.020)	2.891***	(0.036)
Mass Requester Country (Ln)	2.320***	(0.022)	3.213***	(0.052)
Employment Protection Difference (Ln)	0.963	(0.098)	0.801	(0.262)
Difference National Social Dialogue (Ln)	1.184*	(0.077)	1.664*	(0.218)
Intercept	0.000***	(0.433)	0.000***	(1.185)
Adjusted R2	0.275		0.707	
Theta	5.010***			
2 X Log Likelihood	-4205.266			
AIC	4239.3			

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE A4 | Regression models predicting the number of hiring transactions (negative binomial) and total money flow (linear regression) between two countries (directed) with common minority language.

	Transactions		Money flow	
	OR	*SE*	*OR*	*SE*
Wage Difference (Ln)	1.394***	(0.085)	1.654*	(0.241)
Geographical Distance (Ln)	0.762***	(0.043)	0.703**	(0.120)
Vocational Education Difference (Ln)	1.000	(0.028)	1.014	(0.073)
Difference STEM graduates (Ln)	1.111*	(0.051)	0.970	(0.144)
Home Country Bias	2.527***	(0.220)	2.662*	(0.474)
Difference Institutional Quality (Ln)	0.991	(0.163)	0.785	(0.415)
Difference Trust (Ln)	1.047	(0.029)	1.067	(0.085)
Difference Respect (Ln)	1.019	(0.031)	1.030	(0.080)
Difference Control (Ln)	0.935	(0.043)	0.931	(0.114)
Difference Obedience (Ln)	0.973	(0.031)	0.962	(0.079)
Common Language minority	1.691***	(0.134)	1.958**	(0.227)
Mass Freelancer Country (Ln)	2.333***	(0.019)	2.886***	(0.037)
Mass Requester Country (Ln)	2.325***	(0.021)	3.211***	(0.052)
Employment Protection Difference (Ln)	0.939	(0.096)	0.793	(0.260)
Difference National Social Dialogue (Ln)	1.186*	(0.075)	1.691*	(0.216)
Intercept	0.000***	(0.515)	0.000***	(1.458)
Adjusted R2	0.280		0.708	
Theta	5.281***			
2 X Log Likelihood	-4174.949			
AIC	4208.9			

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

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TABLE A5 | **Regression models predicting the number of hiring transactions (negative binomial) and total money flow (linear regression) between two countries (directed) with amount of workers and requesters as controls.**

	Transactions		Money flow	
	OR	SE	OR	SE
Wage Difference (Ln)	1.283**	(0.095)	1.579	(0.257)
Geographical Distance (Ln)	0.761***	(0.050)	0.655***	(0.128)
Vocational Education Difference (Ln)	1.024	(0.031)	1.031	(0.077)
Difference STEM graduates (Ln)	1.143*	(0.062)	1.477**	(0.147)
Home Country Bias	2.360**	(0.268)	2.179	(0.551)
Difference Institutional Quality (Ln)	1.150	(0.160)	0.595*	(0.411)
Difference Trust (Ln)	0.987	(0.032)	1.051	(0.088)
Difference Respect (Ln)	1.066	(0.038)	1.104	(0.085)
Difference Control (Ln)	0.855***	(0.045)	0.806	(0.114)
Difference Obedience (Ln)	0.978	(0.036)	1.054	(0.081)
Common Language	1.722**	(0.176)	2.021*	(0.339)
Mass Freelancer Country (Ln)	2.673***	(0.024)	4.218***	(0.051)
Mass Requester Country (Ln)	2.318***	(0.026)	3.434***	(0.061)
Employment Protection Difference (Ln)	1.189	(0.111)	1.077	(0.269)
Difference National Social Dialogue (Ln)	1.116	(0.083)	1.924**	(0.226)
Intercept	0.000***	(0.583)	0.000***	(1.437)
Adjusted R2	0.264		0.695	
Theta	4.182***			
2 X Log Likelihood	-4268.744			
AIC	4302.7			

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

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Appendix B

TABLE B1 | Institutional variables per country.

Country	Employment protection	Vocational Specificity
Austria	2.285	32.70
Belgium	2.067	3.30
Canada	0.587	0.00
Czech Republic	3.257	35.50
Denmark	1.531	47.70
Finland	2.000	10.50
France	2.559	11.30
Germany	2.595	45.00
Greece	2.452	5.10
Hungary	1.587	13.20
Ireland	1.230	3.80
Italy	2.557	0.00
Japan	1.369	0.00
Netherlands	3.611	20.00
New Zealand	1.642	0.00
Norway	2.333	13.30
Poland	2.325	6.50
Slovenia	2.075	3.70
Spain	2.047	2.80
Sweden	2.446	0.00
Switzerland	1.428	58.30
United Kingdom	1.345	0.00
United States	0.093	0.00

TABLE B2 | Multilevel linear regression models predicting the skill specificity of gig workers, using all skills.

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Education (Vocational=ref):								
Lower than Vocational	-0.427***	(0.161)	-0.417***	(0.160)	-0.426***	(0.161)	-0.416***	(0.160)
Bachelor	-0.138	(0.097)	-0.132	(0.097)	-0.139	(0.097)	-0.133	(0.097)
Master	-0.334***	(0.100)	-0.328***	(0.100)	-0.337***	(0.100)	-0.330***	(0.100)
PhD	-0.371**	(0.180)	-0.369**	(0.180)	-0.378**	(0.180)	-0.373**	(0.180)
Offline job tenure (Ln)	-0.019	(0.059)	-0.020	(0.059)	-0.019	(0.059)	-0.020	(0.059)
Online job experience (Ln)	-0.481***	(0.029)	-0.480***	(0.029)	-0.481***	(0.029)	-0.480***	(0.029)
Vocational specificity					-0.045	(0.037)	-0.031	(0.036)
Employment protection			-0.082*	(0.043)			-0.069	(0.045)
Average five-star rating (0/1)	-0.117**	(0.059)	-0.114*	(0.059)	-0.116**	(0.059)	-0.113*	(0.059)
Missing work experience (0/1)	-0.101	(0.129)	-0.105	(0.129)	-0.099	(0.129)	-0.103	(0.129)
R²		.133		.139		.136		.140
N (Countries)		23		23		23		23
N (Individuals)		2,620		2,620		2,620		2,620

Note. * $p < .10$; ** $p < .05$; *** $p < .01$

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TABLE B3 | VIF scores.

	VIF
Degree	1.00
Offline job tenure (Ln)	5.71
Online job experience (Ln)	1.57
Average five-star rating	1.53
Missing work experience	5.62
Vocational specificity	1.35
Employment protection	1.36
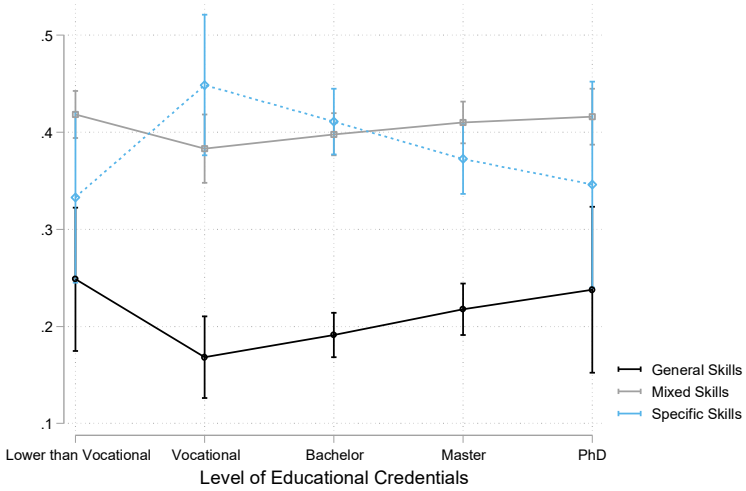
FIGURE B1 | Marginal effect of Education on Skill Specificity.

Appendix C

TABLE C1 | VIF scores.

	VIF
Number five-star reviews	2.68
Number non-five-star reviews	2.71
First gig job	1.05
Domestic gig hiring	1.94
Job type: Writing	4.01
Job type: ICT	4.11
Job type: Accounting	1.34
Job type: Design	3.48
Job type: Other	1.09
Offline experience in months	4.78
No offline experience	4.78
Number of relevant skill exams completed	1.24
Level educational degree	1.07
Difference educational systems	1.19
Difference employment protection	1.97

TABLE C2 | The association between educational attainment and project value (Ln) conditional on foreign or domestic hiring.

	Model 1		Model 2	
	B	SE	B	SE
Level educational degree: Vocational	0.256**	(0.088)		
Level educational degree: Bachelor	0.348***	(0.089)		
Level educational degree: Master	0.452***	(0.131)		
Level educational degree: PhD	0.175	(0.107)		
Level educational degree			0.102***	(0.021)
Level educational degree: Vocational * Domestic hiring	–0.086	(0.082)		
Level educational degree: Bachelor * Domestic hiring	–0.075	(0.065)		
Level educational degree: Master * Domestic hiring	–0.152*	(0.066)		
Level educational degree: PhD * Domestic hiring	–0.137	(0.100)		
Level educational degree * Domestic hiring			–0.049**	(0.016)
Offline work experience months (Ln)	0.127**	(0.040)	0.125**	(0.040)
No offline work experience	0.193*	(0.082)	0.191*	(0.082)
Number five-star reviews	0.228***	(0.012)	0.228***	(0.012)
Number non-five-star reviews	0.022	(0.012)	0.022	(0.012)
First job penalty	–0.323***	(0.024)	–0.323***	(0.024)
Domestic hiring	0.164**	(0.063)	0.222***	(0.054)
Number relevant skill exams	–0.010	(0.013)	–0.010	(0.013)
Job type: Writing	–0.112***	(0.027)	–0.113***	(0.027)
Job type: ICT	0.158***	(0.023)	0.158***	(0.023)
Job type: Accounting	0.162***	(0.032)	0.161***	(0.032)
Job type: Design	0.032	(0.022)	0.033	(0.022)
Job type: Other	0.032	(0.021)	0.033	(0.021)
Country gig worker	Included		Included	
Country gig requester	Included		Included	
N (workers)	**3,637**		**3,637**	
N (gig jobs)	**51,454**		**51,454**	

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

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TABLE C3 | Multilevel linear regression models on project value (Ln) with requested hourly wage included.

	Model 1		Model 3	
	B	SE	B	SE
Educational degree present	0.057*	(0.023)		
Level educational degree			0.059***	(0.015)
Offline work experience months (Ln)	0.148***	(0.033)	0.095*	(0.039)
No offline work experience	0.257***	(0.065)	0.141	(0.081)
Requested hourly wage	0.101***	(0.009)	0.139***	(0.017)
Number five-star reviews	0.202***	(0.009)	0.227***	(0.012)
Number non-five-star reviews	0.028**	(0.010)	0.023*	(0.012)
First job penalty	-0.332***	(0.015)	-0.320***	(0.024)
Domestic hiring	0.071***	(0.009)	0.060***	(0.013)
Number relevant skill exams	0.003	(0.009)	-0.013	(0.013)
Job type: Writing	-0.115***	(0.019)	-0.105***	(0.027)
Job type: ICT	0.134***	(0.016)	0.157***	(0.023)
Job type: Accounting	0.178***	(0.024)	0.162***	(0.032)
Job type: Design	0.035*	(0.016)	0.032	(0.022)
Job type: Other	0.015	(0.016)	0.032	(0.021)
Country gig worker	Included		Included	
Country gig requester	Included		Included	
N (workers)	**10,116**		**3,637**	
N (gig jobs)	**103,362**		**51,454**	

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE C4 | The association between educational attainment and project value (Ln) conditional on foreign or domestic hiring with requested hourly wage included.

	Model 2	
	B	SE
Level educational degree	0.072***	(0.015)
Level educational degree * Domestic hiring	-0.037**	(0.012)
Offline work experience months (Ln)	0.094*	(0.039)
No offline work experience	0.140	(0.081)
Requested hourly wage	0.140***	(0.017)
Number five-star reviews	0.227***	(0.012)
Number non-five-star reviews	0.023	(0.012)
First job penalty	-0.321***	(0.024)
Domestic hiring	0.058***	(0.013)
Number relevant skill exams	-0.013	(0.013)
Job type: Writing	-0.104***	(0.027)
Job type: ICT	0.157***	(0.023)
Job type: Accounting	0.162***	(0.032)
Job type: Design	0.032	(0.022)
Job type: Other	0.032	(0.021)
Country gig worker	Included	
Country gig requester	Included	
N (workers)	**3,637**	
N (gig jobs)	**51,454**	

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE C5 | Multilevel linear regression models on project value (Ln) of foreign hirings with requested hourly wage included.

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Level educational degree	0.077***	(0.017)	0.077***	(0.017)	0.068***	(0.017)
Difference educational systems	-0.036**	(0.012)	-0.036**	(0.012)	-0.036**	(0.012)
Difference employment protection	-0.005	(0.009)	-0.005	(0.009)	-0.004	(0.009)
Diff educational systems * Educational degree			0.000	(0.006)		
Diff employment protection * Educational degree					0.020**	(0.007)
Offline work experience months (Ln)	0.069	(0.045)	0.069	(0.045)	0.067	(0.045)
No offline work experience	0.078	(0.093)	0.078	(0.093)	0.074	(0.093)
Requested hourly wage	0.134***	(0.019)	0.134***	(0.019)	0.135***	(0.019)
Number five-star reviews	0.205***	(0.014)	0.205***	(0.014)	0.205***	(0.014)
Number non-five-star reviews	0.012	(0.014)	0.012	(0.014)	0.012	(0.014)
First job penalty	-0.291***	(0.031)	-0.291***	(0.031)	-0.291***	(0.031)
Number relevant skill exams	-0.009	(0.015)	-0.009	(0.015)	-0.009	(0.015)
Job type: Writing	-0.127***	(0.033)	-0.127***	(0.033)	-0.127***	(0.033)
Job type: ICT	0.121***	(0.029)	0.121***	(0.029)	0.122***	(0.029)
Job type: Accounting	0.132**	(0.041)	0.132**	(0.041)	0.132**	(0.041)
Job type: Design	0.039	(0.028)	0.039	(0.028)	0.039	(0.028)
Job type: Other	0.038	(0.026)	0.038	(0.026)	0.038	(0.026)
Country gig worker	Included		Included		Included	
Country gig requester	Included		Included		Included	
N (workers)	**2,785**		**2,785**		**2,785**	
N (gig jobs)	**34,216**		**34,216**		**34,216**	

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE C6 | Multilevel linear regression models on project value (Ln) with only individual gig workers.

	Model 1		Model 3	
	B	SE	B	SE
Educational degree present	0.101***	(0.028)		
Level educational degree			0.081***	(0.018)
Offline work experience months (Ln)	0.167***	(0.040)	0.119*	(0.048)
No offline work experience	0.254**	(0.078)	0.129	(0.098)
Number five-star reviews	0.172***	(0.012)	0.157***	(0.014)
Number non-five-star reviews	0.020	(0.012)	0.020	(0.013)
First job penalty	-0.321***	(0.019)	-0.289***	(0.030)
Domestic hiring	0.073***	(0.012)	0.054***	(0.016)
Number relevant skill exams	-0.022	(0.012)	-0.025	(0.016)
Job type: Writing	-0.134***	(0.024)	-0.110**	(0.034)
Job type: ICT	0.091***	(0.022)	0.086**	(0.030)
Job type: Accounting	0.156***	(0.031)	0.177***	(0.041)
Job type: Design	0.039	(0.021)	0.055	(0.030)
Job type: Other	0.030	(0.020)	0.033	(0.026)
Country gig worker	Included		Included	
Country gig requester	Included		Included	
N (workers)	**6,116**		**2,297**	
N (gig jobs)	**59,578**		**31,295**	

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

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TABLE C7 | **The association between educational attainment and project value (Ln) conditional on foreign or domestic hiring with only individual gig workers.**

	Model 2	
	B	SE
Level educational degree	0.093***	(0.019)
Level educational degree * Domestic hiring	-0.037*	(0.015)
Offline work experience months (Ln)	0.118*	(0.048)
No offline work experience	0.129	(0.098)
Number five-star reviews	0.157***	(0.014)
Number non-five-star reviews	0.020	(0.013)
First job penalty	-0.289***	(0.030)
Domestic hiring	0.053**	(0.016)
Number relevant skill exams	-0.025	(0.016)
Job type: Writing	-0.109**	(0.034)
Job type: ICT	0.086**	(0.030)
Job type: Accounting	0.177***	(0.041)
Job type: Design	0.055	(0.030)
Job type: Other	0.033	(0.026)
Country gig worker	Included	
Country gig requester	Included	
N (workers)	**2,297**	
N (gig jobs)	**31,295**	

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE C8 | **Multilevel linear regression models on project value (Ln) of foreign hirings with only individual gig workers.**

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Level educational degree	0.103***	(0.020)	0.103***	(0.020)	0.095***	(0.021)
Difference educational systems	-0.020	(0.014)	-0.020	(0.014)	-0.020	(0.014)
Difference employment protection	0.002	(0.011)	0.002	(0.011)	0.003	(0.011)
Diff educational systems * Educational degree			-0.001	(0.007)		
Diff employment protection * Educational degree					0.017	(0.008)
Offline work experience months (Ln)	0.090	(0.053)	0.090	(0.053)	0.088	(0.053)
No offline work experience	0.084	(0.110)	0.084	(0.110)	0.082	(0.110)
Number five-star reviews	0.147***	(0.016)	0.147***	(0.016)	0.147***	(0.016)
Number non-five-star reviews	0.013	(0.015)	0.013	(0.015)	0.012	(0.015)
First job penalty	-0.260***	(0.039)	-0.260***	(0.039)	-0.260***	(0.039)
Number relevant skill exams	-0.019	(0.018)	-0.019	(0.018)	-0.019	(0.018)
Job type: Writing	-0.104*	(0.041)	-0.104*	(0.041)	-0.105*	(0.041)
Job type: ICT	0.090*	(0.036)	0.090*	(0.036)	0.091*	(0.036)
Job type: Accounting	0.168**	(0.051)	0.168**	(0.051)	0.169**	(0.051)
Job type: Design	0.096**	(0.036)	0.096**	(0.036)	0.097**	(0.036)
Job type: Other	0.040	(0.031)	0.040	(0.031)	0.040	(0.031)
Country gig worker	Included		Included		Included	
Country gig requester	Included		Included		Included	
N (workers)	**1,787**		**1,787**		**1,787**	
N (gig jobs)	**21,668**		**21,668**		**21,668**	

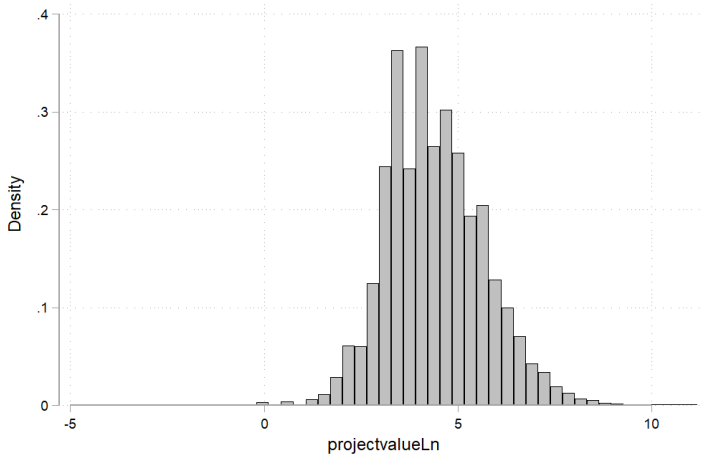*Note.* * $p < .05$; ** $p < .01$; *** $p < .001$

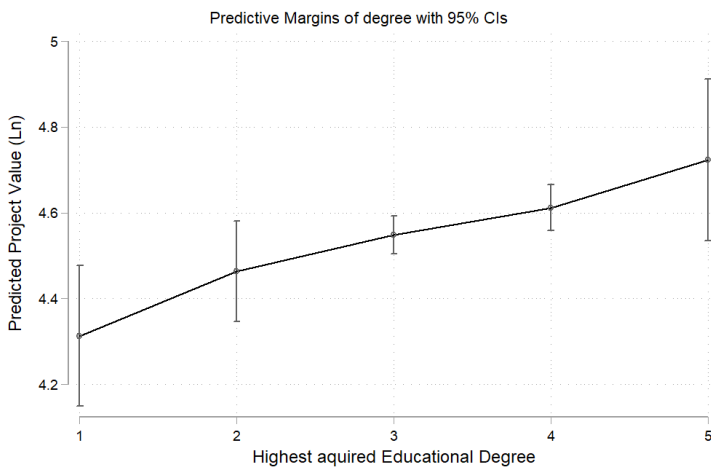**FIGURE C1 | Histogram of Project Value (Ln).**

FIGURE C2 | Marginal Effects of Educational Degree on Project Value (Ln).

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Summary

The advent of online platforms that match the supply and demand of flexible labour has been one of the most significant economic changes in the last decades. The emergence of such platforms reflects a longer trend of increasingly contingent work, labour market flexibility, outsourcing of work to independent contractors and circumventing national institutions for more company-friendly work arrangements. This so-called "gig economy" can be classified based on two dimensions: whether the service requested is geographically bounded and whether the job requires high or low skills. In the geographically tethered onsite gig economy, locally bounded services range from food delivery and ride-hailing to babysitting and tutoring. In contrast, the online gig economy consists of low-skill services such as image tagging or click work but also of high-skill work like programming, administration and research writing.

Since the online gig economy consists of trade in services that are digitally transferable, workers can complete the work worldwide, eliminating transportation costs and the required locality of work. This creates an opportunity to circumvent nationally specific institutions by fostering international hiring on platforms with their own institutions, rules and structures. Paradoxically, these online gig platforms also rely on the functioning of some of those national institutions, such as national education systems, that provide a well-trained workforce, especially for high-skill jobs in countries with well-developed educational systems, such as those in the Global North. In addition, the scarce nature of the needed skills in this market potentially provides leverage for workers in these "global labour markets".

This thesis contributes to the theoretical and empirical understanding of national institutions' indirect influence on workers' positions in the online gig economy via the provision of skills and educational credentials. It focuses on hiring behaviour on one of the biggest high-skill online gig platforms. Examining workers' profiles, combined with their entire work history on the given platform, this dissertation assesses how geographical and institutional distance shape hiring behaviour, whether national institutions predict which skills workers are hired for, and whether educational credentials still hold labour market returns in the Global North. By doing so, chapters 2-5 of this dissertation provide some first insights into the question: "To what extent and how do national institutions influence inequality between workers in the high-skill online gig economy in the Global North?"

In chapter 2, we start by providing an overview of the concept "gig economy" since understanding this phenomenon is vital to understanding in what ways and why the gig economy is different from more traditional parts of the labour market. Thereby, it shows how (indirect) influence from national institutions can be asserted. Following a literature review, we demonstrate that different conceptualisations of the gig economy can be structured along four dimensions: online intermediation, independent contractors, paid tasks, and personal services. The boundaries of those four dimensions are inherently blurry. Therefore, it is possible to derive both a narrow definition of the gig economy

and broader definitions that can include offline intermediation, employees, unpaid tasks and/or asset sharing. Choices made among those dimensions are vital to what is considered part of the gig economy, what are present societal issues involving the gig economy, and what solutions there are for those issues. Furthermore, we argue that those four dimensions relate to four regulatory questions: how should online platforms be regulated; how should gig workers be regulated; what counts as paid work; and should we treat labour earnings differently from asset sharing earnings?

In chapter 3, the hiring behaviour on high-skill online gig platforms is examined to assess whether geographical and institutional distance predicts the hiring behaviour between European countries. Using a gravity model of trade, we show in this chapter that geographical distance is still a vital predictor of hiring behaviour in the high-skill online gig economy, and domestic hiring is preferred over international hiring. Furthermore, having a common official language increased the amount of trade between countries. However, interestingly, any kind of regulatory institutional differences did not impact hiring behaviour in the high-skill online gig economy, suggesting that these online gig platforms successfully create their own institutional framework, which circumvents national regulation.

Chapter 4 studies what factors predict the type of skills that gig workers are hired for in the high-skill online gig economy. Based on literature in educational sociology and labour economics, we classified the skills workers are hired for as either "general skills", "specific skills", or "mixed skills". Then, based on that same literature, we examine on the individual level whether educational credentials and job tenure predict the skill type of workers. On the national level, we investigate whether the type of educational system and level of labour market protection explains the skill type of workers. The results show that individual education predicts which skills workers are hired for, but job tenure does not. Furthermore, the national-level indicators did not predict workers' skill types in the expected direction. Instead, a weak opposite effect was found. These latter two findings indicate that the high-skill online gig economy operates as a possible substitute market, where workers with skills undervalued in their national labour market move towards the high-skill online gig economy.

Chapter 5 assessed whether educational credentials still function as an important labour market signal and, therefore, hold labour market returns. It furthermore examines whether the skill signal is universal across domestic and foreign hirings and independent of institutional dissimilarity between countries. By exploring more than 100,000 completed gig transactions, we show that the level of educational degree shown on a profile is positively associated with the monetary size of the gig jobs acquired. However, the size of these labour market returns is smaller than in studies of traditional labour markets, and compared to other skill signals such as the five-star rating system. In addition, we find a strong "transferability of degrees" across countries in the Global North, especially for general academic educational degrees. The degree transferability of vocational education is lower but still present in the high-skill online gig economy. These results indicate that the economic value of educational degrees is still manifest in the high-skill online gig economy but substantially smaller than in other markets.

Taken together, these chapters provide essential insights and a nuanced answer to whether and how national institutions indirectly influence workers' positions in the high-skill online gig economy. On the one hand, the high-skill online gig economy seems less "beyond national reach" as sometimes portrayed. International inequalities in the high-skill online gig economy endure along expected lines, even in a relatively homogeneous region such as the Global North. On the other hand, these institutional influences are substantially reduced in importance compared to offline labour markets. In that sense, the high-skill online gig economy changes national institutions' role in labour market inequalities. Especially macro-level labour market structures hardly predict economic behaviour in the high-skill online gig economy.

If national governmental institutions want to influence the high-skill online gig economy, they need to adept their practices since their old ways have become irrelevant. They can do so in three ways: national regulators can leverage the dependence of these platforms on a well-trained workforce into a confrontational approach; they can change the level of regulation to the supranational level; or they can focus on informal controlling mechanism of platforms, such as platform reputations or blacklisting bad faith platforms. These three options are elaborated in the conclusion of this dissertation.

Nederlandse Samenvatting

De opkomst van online platformen die vraag en aanbod van flexibele arbeid op elkaar afstemmen is een van de belangrijkste economische veranderingen van de afgelopen decennia. Deze opkomst weerspiegelt een langere trend van steeds meer werk met onzekere arbeidsvoorwaarden, flexibiliteit van de arbeidsmarkt, uitbesteding van werk aan zelfstandigen, en omzeiling van nationale regelgeving voor meer bedrijfsvriendelijke arbeidsverhoudingen. Verschillende varianten van deze "kluseconomie" kunnen worden gecategoriseerd op basis van twee dimensies. De ene dimensie is of de dienst geografisch gebonden is. De andere dimensie is of voor het uitvoeren van de taak hoogwaardige vaardigheden zijn vereist. De geografisch gebonden *onsite* kluseconomie bestaat uit diensten die een locatie gebonden zijn. Dit deel van de kluseconomie bevat maaltijdbezorging en *ride-hailing*, maar bijvoorbeeld ook schoonmaak en oppas. Daarnaast bestaat de niet-locatie gebonden *online* kluseconomie uit laaggeschoolde diensten zoals *image tagging* of klikwerk, maar ook uit hooggeschoold werk zoals programmeren, administratie en het schrijven/vertalen.

Aangezien de online-kluseconomie bestaat uit digitaal overdraagbare diensten kunnen werkers van over heel de wereld deze uitvoeren. Eventuele transportkosten vervallen, en werkers hoeven niet op een bepaalde locatie hun werk te doen. Dit creëert de mogelijkheid om nationale regulering en instituties te omzeilen door middel van het inhuren van buitenlandse werkers via een platform die eigen structuren en regels hanteert. Paradoxaal genoeg zijn deze online klusplatformen ook afhankelijk van het goed functioneren van sommige van die nationale instituties. Zo vertrouwen zij erop dat nationale onderwijssystemen zorgen voor goed opgeleide en vaardige werkers, met name als het gaat om taken waar complexe vaardigheden voor zijn vereist. De schaarste van werkers met complexe vaardigheden creerd onderhandelingsmacht voor werkers ten opzichte van de klusplatformen.

Dit proefschrift draagt bij aan het theoretische en empirische inzicht in hoe nationale instituties indirecte invloed hebben, via training en educatie, op de positie van werkers in de online-kluseconomie. De profielen en volledige werkgeschiedenis van werknemers op een van de grootste online klusplatformen is geanalyseerd. Daardoor worden verschillende vragen beantwoord, zoals hoe geografische afstand en institutionele verschillen transactiepatronen bepalen, of nationale instituties voorspellen voor welke vaardigheden werknemers worden aangenomen, en of diploma's economisch rendement opleveren. Op die manier bieden de hoofdstukken 2-5 van dit proefschrift een eerste inzicht in de vraag: In welke mate en hoe beïnvloeden nationale instituties de ongelijkheid tussen werkers in de hoogwaardige online-kluseconomie in de "Global North"?

Hoofdstuk 2 begint met een overzicht van het concept van de "kluseconomie", omdat begrip van wat dit fenomeen behelst essentieel is om te omschrijven hoe de kluseconomie verschilt van meer traditionele arbeidsmarkten. Na een literatuurstudie laten we zien dat verschillende conceptualisaties van de kluseconomie kunnen worden gestructureerd langs vier dimensies: 1. dat de bemiddeling online plaatsvindt; 2. de werker een zelfstandige is;

3. het betaalde taken betreft; en 4. om diensten in plaats van goederen gaat. De grenzen van deze vier dimensies zijn inherent vaag. Daarom is aan de hand van deze dimensies mogelijk een enge definitie van de kluseconomie af te leiden, maar ook bredere definities die offline bemiddeling, werknemers, onbetaalde taken en/of het delen van goederen kunnen omvatten. Hoe aan de hand van deze dimensies wordt besloten wat onder de term "kluseconomie" valt is van vitaal belang voor wat de potentiele maatschappelijke problemen met betrekking tot de kluseconomie zijn, en welke oplossingen er voor die problemen zijn. Verder stellen we in dit hoofdstuk dat deze vier dimensies verband houden met vier reguleringsvragen: 1. hoe moeten online platforms worden gereguleerd; 2. hoe moeten kluswerkers worden gereguleerd; 3. wat telt als betaald werk; en 4. moeten we inkomsten uit arbeid anders behandelen dan inkomsten uit het delen van goederen?

In hoofdstuk 3 wordt onderzocht of geografische en institutionele afstand tussen landen invloed heeft op de handel tussen deze landen in de hoogwaardige online-kluseconomie in Europa. Met behulp van een zwaartekrachtmodel laten we in dit hoofdstuk zien dat geografische afstand nog steeds een belangrijke voorspeller is van handel in de online-kluseconomie voor hoogwaardige diensten, en dat het inhuren van een binnenlandse werker de voorkeur heeft over het inhuren van een werker uit het buitenland. Daarnaast heeft het hebben van een gemeenschappelijke officiële taal een stimulerende invloed op de handel tussen landen. Interessant is echter dat institutionele verschillen in regelgeving geen invloed hadden op de handel in de online-kluseconomie, wat suggereert dat deze online klusplatformen er in slagen een eigen institutioneel kader te creëren die losstaat van nationale regelgeving.

Hoofdstuk 4 onderzoekt of kan worden voorspeld voor wat voor een soort vaardigheden werkers ingehuurd worden in de online-kluseconomie. Op basis van literatuur in de educatiesociologie en arbeidseconomie, hebben we de vaardigheden van werkers geclassificeerd als "generiek", "specifiek" of "gemengd". Vervolgens onderzoeken we, op basis van dezelfde literatuur, op individueel niveau of het opleidingsniveau, het aantal maanden in de langste baan in de traditionele arbeidsmarkt en ervaring op het platform, het vaardigheidstype van werkers voorspellen. Daarnaast onderzoeken we op nationaal niveau of het type onderwijsstelsel en de mate van arbeidsbescherming invloed heeft op het type vaardigheden. Uit de resultaten blijkt dat het opleidingsniveau van de individuele werker voorspelt voor welke vaardigheden werkers worden aangenomen. Het aantal maanden in de langste baan in de traditionele arbeidsmarkt heeft geen invloed op de vaardigheden waarop werkers worden ingehuurd, maar de ervaring op het platform wel. Bovendien voorspelden de indicatoren op nationaal niveau het vaardigheidstype van werkers niet op de manier die we verwachtten. In plaats daarvan werd een zwak tegengesteld effect gevonden. De bevindingen suggereren dat de online-kluseconomie voor hoogwaardige diensten werkt als een mogelijke vervangende arbeidsmarkt, waarbij werkers met vaardigheden die op hun nationale arbeidsmarkt ondergewaardeerd zijn, overstappen naar de online kluseconomie.

In hoofdstuk 5 is bekeken of onderwijsdiploma's nog steeds als een signaal naar de arbeidsmarkt fungeren in de online-kluseconomie voor hoogwaardige diensten. Ook

wordt onderzocht of dat signaal universeel is voor binnenlandse en buitenlandse transacties en of het afhankelijk is van institutionele verschillen tussen landen. Door meer dan 100.000 voltooide kluseconomie-taken te onderzoeken, laten we zien dat het opleidingsniveau dat op een klusprofiel wordt getoond, positief samenhangt met de betaling van de taken die voltooit zijn. De omvang van dit positief effect is echter kleiner dan de effecten zoals die zijn gevonden in andere studies, en andere signalen, zoals het vijfsterren reputatiesysteem. Verder vinden we een sterke "universaliteit van diploma's" tussen landen in de "Global North". Dit betekent dat het signaal van een diploma niet minder wordt bij internationale transacties, of dat institutionele verschillen hier invloed op hebben. Deze universaliteit is sterker onder academische diploma's. De overdraagbaarheid van diploma's uit het beroepsonderwijs is lager, maar nog steeds aanwezig in de online-kluseconomie. De resultaten wijzen erop dat de economische waarde van onderwijskwalificaties nog steeds een rol speelt in de online-kluseconomie voor hoogwaardige taken, maar aanzienlijk minder sterk is dan in traditionele markten.

Tezamen bieden deze hoofdstukken essentiële inzichten en een genuanceerd antwoord op de vraag hoe nationale instituties op een indirecte manier de positie van werkers beïnvloeden in de online-kluseconomie voor hoogwaardige diensten. Aan de ene kant lijkt de online-kluseconomie minder "buiten nationaal bereik" te liggen dan soms wordt gesuggereerd. Internationale ongelijkheid in deze tak van online-kluseconomie blijft bestaan langs vergelijkbare lijnen als die in traditionele markten, zelfs in een relatief homogene regio als de "Global North". Anderzijds zijn de institutionele invloeden onderzocht in dit proefschrift aanzienlijk minder invloedrijk dan in traditionele arbeidsmarkten. In die zin verandert de online-kluseconomie de rol van nationale instituties in arbeidsmarktongelijkheid wel degelijk. Vooral institutionele structuren en indicatoren op macro-(landelijk-)niveau voorspellen nauwelijks de opdrachtrelaties in de online-kluseconomie voor hoogwaardige diensten.

Als nationale overheden de online-kluseconomie willen beïnvloeden, moeten zij hun strategieën en praktijken aanpassen, omdat hun oude manieren sterk aan belang inboeten. Dit kan op drie manieren: 1. Nationale instituties kunnen de afhankelijkheid van online klusplatformen op een vaardige en goedgetrainde groep werkers gebruiken om een confronterende houding aan te nemen tegenover deze platformen. 2. Het niveau van invloed en regulering kan verplaatst worden naar het supranationale niveau. 3. De online-kluseconomie kan gereguleerd worden via informele instituties zoals reputatiesystemen voor platformen en het "blacklisten" van uitbuitende platformen. Deze drie opties worden kort uitgewerkt in de conclusie van dit proefschrift.

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About the author

Jaap van Slageren was born on 14 December 1993 in Utrecht, The Netherlands. From a young age, Jaap encountered a wide range of people in precarious positions, due to his mothers' work as a therapist and the fact that her workspace was attached to the house. This experience created a concern for social inequality and the societal and political structures that reproduce it early on. In pursuing knowledge on this topic, he obtained a bachelor's degree in Sociology from Utrecht University, and the master's degrees "Contemporary Social Problems" (Cum Laude) and "Sociology and Social Research" (Cum Laude) from the same university. During his studies, Jaap worked as a junior researcher at Het PON studying regional social resilience, and at the University of Amsterdam examining political attitudes and populist voting behaviour. After graduation, Jaap started his PhD project at the Copernicus Institute of Sustainable Development, at Utrecht University. During his PhD project, he has conducted a research stay at the Berlin Social Science Centre (WZB), as part of the research group "Skill Formation and Labor Markets".

Jaap's research interests span various topics, often interdisciplinary oriented but always with a sociological and inequality-oriented perspective included. The overlap between Sociology, Political Science, and Institutional Economics interests him the most. Most specifically, his research endeavours include the economic and political consequences of educational degrees, institutions and transforming societies. As of September 2022, he works as a postdoctoral researcher at the Amsterdam Centre for Inequalities Studies (AMCIS), part of the University of Amsterdam.