Multinational firms and the quest for global talent

Journal of International Business Studies (2023)

www.jibs.net

Multinational firms and the quest for global talent: Employing (skilled) foreign workers at home and abroad

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Abstract

Multinational firms can access global talent in two ways: by employing migrants in their home country, or by employing foreign workers in their overseas affiliates. Taking a knowledge-based perspective, we conceptualize these employment decisions as simultaneous and subject to management coordination. Substitution effects are greater when there is a larger wage cost differential between home and host countries, leading to a cost-reduction motivation for foreign expansion and the offshoring of employment. Substitution also occurs when R&D intensive firms employ highly skilled and internationally mobile foreign workers and employ these where the worker's knowledge and skills can be most productively put to use. In contrast, a complementary relationship occurs when the migrant country exhibits a high contextual distance with the home country of the firm, leading to knowledge (diversity) benefits of migrant employment at home when expanding abroad. Analyzing employee–employer and foreign affiliate data for multinational firms in the Netherlands (2008–2016) and estimating simultaneous equation models, we find support for these hypotheses. Our findings suggest that policies that restrict immigration may have a negative impact on the competitiveness of home-country multinational firms by limiting their ability to engage in value enhancing coordination of domestic and foreign employment growth.

Journal of International Business Studies (2023).
https://doi.org/10.1057/s41267-023-00643-w

Keywords: knowledge-based view; migrants; contextual distance; skill-intensive

INTRODUCTION

The global mobility of workers and drawing on their human capital provide important opportunities for multinational enterprises (MNEs) (Andersson, Castellani, Fassio, & Jienwatcharamongkhol, 2022; Edler, Fier, & Grimpe, 2011; Kerr, Kerr, Özden, & Parsons, 2016) to deal with the scarcity of qualified labor in home countries. Hiring migrants to employ them in the firm's home country is one way to deal with domestic labor shortages (Lewin, Massini, & Peeters, 2009). Developed countries have welcomed large numbers of migrant workers during the past decades (Kerr et al., 2016), although increasing numbers of migrants have also sparked adverse

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1057/s41267-023-00643-w.

Received: 21 January 2022
Revised: 16 May 2023
Accepted: 1 June 2023

reactions (Barnard, Deeds, Mudambi, & Vaaler, 2019). There is ample evidence that foreign knowledge can be internationally transferred by the global movement of workers (Agrawal, Cockburn, & McHale, 2006; Wang, 2015). Migrant workers can have a positive influence on domestic operations of MNEs, as they may bring unique human capital to the firm (Froese, Stoermer, Reiche, & Klar, 2020; Laursen, Leten, Nguyen, & Vancauteren, 2020), facilitate networking and knowledge flows within the organization (Harzing, Pudelko, & Sebastian Reiche, 2016), and may drive creative decision-taking through multicultural identities (Vora, Martin, Fitzsimmons, Pekerti, Lakshman, & Raheem, 2019).

In the quest for talent, MNEs have more opportunities to respond to domestic labor shortages compared with national firms (Lewin et al., 2009). MNEs have the option and need to employ foreign talent in their foreign subsidiaries, in line with local environmental conditions and growth objectives of these local units (Meyer, Li, & Schotter, 2020; Minbaeva, Pedersen, Björkman, Fey, & Park, 2014). It is the ability to efficiently organize human capital across dispersed operations that underlies much of the MNE's competitive advantage (Andersson, Brewster, Minbaeva, Narula, & Wood, 2019). In this paper, we explicitly consider that access to global talent from a host country can be obtained by an MNE in two ways: by employing migrant workers in the MNE's operations at home, or by employing host-country workers in the subsidiary of the MNE. We conceptualize domestic and foreign employment growth decisions as a coordinated decision by the MNE and its local affiliate and examine whether employing foreign workers in a host country locally and employing such foreign workers as migrants in the MNE's home country are substitutes or complements. Examining whether and how MNEs coordinate domestic and foreign employment decisions of foreign workers is important as it allows to develop a better understanding of the microdynamics of employment decisions that often underpin knowledge creation, knowledge transfer, and knowledge recombination processes that are key sources of competitive advantage of MNEs (Almeida, Song, & Grant, 2002; Kogut & Zander, 1993; Minbaeva et al., 2014). By understanding these microdynamics, we can obtain insight into how (migration) policies restricting or facilitating the mobility of workers impact the global operations and performance of MNEs (Barnard et al., 2019; Kunczer, Lindner, & Puck, 2019).

We draw on the knowledge-based view of the MNE (Almeida et al., 2002; Kogut & Zander, 1993; Kunczer et al., 2019) to integrate extant literature that has hitherto examined migrant employment in a rather compartmentalized fashion: studies on migration and foreign direct investment (e.g., Javorcik, Özden, Spatareanu, & Neagu 2011), learning by hiring (e.g., Laursen et al., 2020), employment allocation in MNEs (e.g., Harrison & McMillan, 2011), and global talent management (e.g., Stahl, Björkman, Farndale, Morris, Paauwe, & Stiles 2012). We conceptualize the relationship between foreign and domestic employment growth as depending on three mechanisms: contextual knowledge complementarity, activity substitution, and human capital substitution, with the net effect depending on the differences between home and host countries' characteristics and the nature of MNE operations. We argue that a greater contextual distance between home and host countries (dissimilarity in culture, language, and institutions) brings diversity-related benefits of migrant employment at home that facilitate foreign expansion. Similarly, employment growth abroad increases the need to embed related contextual knowledge in the MNE's home operation. This suggests a complementary relationship between foreign and domestic employment growth. In contrast, a greater dissimilarity in wage costs between home and host countries is associated with a cost reduction motivation for foreign expansion and a substitutive relationship, as the MNE substitutes lower-cost foreign activities for higher-cost domestic operations. Substitution is also more likely if the MNE is R&D intensive and employment focuses on highly skilled and internationally mobile labor (Edler et al., 2011; Kerr et al., 2016) to utilize global talent management and placement efforts to allocate employees under skill scarcity.

We test hypotheses by employing a unique employee–employer matched dataset on 1940 MNEs located in the Netherlands that combines information on the employment growth of foreign (non-EU) workers in the home country and in (non-EU) foreign subsidiaries between 2008 and 2016.We focus on non-EU migrant hiring as this brings more substantive heterogeneity in contextual distance and relative wage costs. Our definition of migrants is not nationality-based, since nationalities can change upon migration, but is based on the country of origin from which the foreign workers migrate to the Netherlands. Domestic employment growth captures net changes in the

number of migrant employees: the hiring of newly arrived migrants or migrants studying or working in the Netherlands, and the departure (voluntarily or by firing) of existing migrant employees. We focus our analysis on the bilateral relationship between domestic employment growth of migrants and foreign employment growth in the home country of these migrants. Modelling employment growth of foreign workers at home and abroad as a simultaneous process and estimating a system of simultaneous equations allowing for spatial lags, we find broad support for our hypotheses. The relationship between domestic and foreign employment growth of foreign workers, while in most cases substitutive in nature, can turn into a complementary relationship in case of pronounced contextual distance or wage cost similarity.

Our study advances the knowledge-based view of the MNE (Almeida et al., 2002; Kogut & Zander, 1993) by offering an integrated perspective on how MNEs coordinate on employment decisions under conditions of knowledge diversity, scarce human capital, and opportunities to reduce labor costs. Our research contributes to several streams of literature. First, we add to the literature on migration and foreign direct investment by conducting a fine-grained study at the firm and affiliate level, which unveils a heterogeneous pattern of foreign and domestic employment growth that has been left unobserved in prior aggregate-level studies that predominant show a complementary relationship (e.g., Javorcik et al., 2011). At the same time, we confirm that a complementary relationship can occur if there is greater scope for contextual knowledge complementarity and diversity, which aligns with the notion in the literatures on learning by hiring (e.g., Laursen et al., 2020) and cross-border employee mobility (e.g., Choudhury & Kim, 2019) that the employment of migrants brings diversity advantages. Second, our analysis contributes to the literature on employment in MNEs (Harrison & McMillan, 2011; Lewin et al., 2009) by showing that the substitutive nature of foreign and domestic employment (growth) depends on the relative wage costs in the home and host countries and the associated cost-reducing motivation of foreign expansion. Third, we contribute to the literature on global talent management (Stahl et al., 2012) by suggesting that, at the employee level, the global allocation of scarce talent under global employment practices is more likely for highly skilled and R&D-intensive operations. Our research responds to the calls by Al Ariss, Cascio, and Paauwe (2014) and Hajro, Caprar, Zikic, and Stahl (2021) for more in-depth study of the linkages between migration and global talent management in MNEs.

THEORETICAL BACKGROUND AND HYPOTHESES

We group three lines of research on the employment of migrant employees and foreign affiliate employment, and propose a theoretical framework based on the knowledge-based view of the MNE (Kogut & Zander, 1993) that integrates the different mechanisms and suggests under which conditions they will be important.

Background Literature

First, prior research on the relationship between foreign direct investment (FDI) and migration at the macro level (Foad, 2012; Javorcik et al., 2011) has mostly observed a positive association between pairs of countries' FDI and migration flows, suggesting complementarity between these two phenomena. One of the explanations is that migrants bring knowledge of, and networks in a host country to the home country, which facilitates trade and investment between these countries (Kunczer et al., 2019). This resonates well with literature on learning by hiring (Rosenkopf & Almeida, 2003; Song, Almeida, & Wu, 2003). In the learning-by-hiring perspective, foreign nationals provide idiosyncratic benefits to firms that employ them, which derive from their unique knowledge and expertise (Agrawal et al., 2006; Laursen et al., 2020; Wang, 2015). Studies on cross-border employee mobility and knowledge spillovers (Agrawal et al., 2006; Breschi & Lissoni, 2009) have suggested that foreign knowledge can be transferred by the global movement of workers, who carry with them knowledge accumulated through prior study and work experience in their country of origin (Choudhury & Kim, 2019; Froese et al., 2020).

Second, research in economics has examined MNEs' employment decisions across locations (Harrison & McMillan, 2011; Kovak, Oldenski, & Sly, 2021). This literature has emphasized trade-offs between foreign and domestic employment, driven in part by global capital allocation decisions (Belderbos, Fukao, Ito, & Letterie, 2013). MNEs' employment decisions are conceived as being coordinated globally, with the location of specific value-added activities determined by their greatest effectiveness and lowest cost. Recent work has

shown differences in domestic employment effects depending on the type and motivation of MNEs' foreign employment investments, with cost-reducing investments more likely to be negative for domestic employment (Kovak et al., 2021). This literature has however not examined migrant employment.

A third line of research has examined MNEs' global talent management. Global talent management includes MNEs' activities to attract, select, develop, and keep the best employees in the most important roles globally (Vaiman, Scullion, & Collings, 2012). It has been demonstrated that employers with appropriate diversity management are particularly attractive to high-skilled migrants, and that failure to coordinate employment decisions across different locations may limit the MNE's ability to take advantage of cross-learning opportunities (Ng & Burke, 2005). An in-depth study about global talent management practices of top-performing MNEs reveals a crucial principle for effective management, which is finding a balance between global and local needs (Stahl et al., 2012). In this view, the decisions of an MNE to employ a foreign national from a host country either in its foreign subsidiary or as a migrant in its domestic operations should aim for the optimal allocation of talent across locations.

Theory and Hypotheses

The main premise of the knowledge-based view of the MNE (Almeida et al., 2002; Kogut & Zander, 1993; Kunczer et al., 2019) is that the key capability and source of competitive advantage of the MNE is its ability to create and transfer (tacit) knowledge across national borders by coordinating operations through its network of domestic and foreign affiliates. In doing so, the MNE not only has to deal with distinct country-specific knowledge (e.g., Foss, Lyngsie, & Zahra, 2013), but also has to reduce (labor) costs by transferring production and technological knowledge to lower-cost labor locations (e.g., Kovak et al., 2021) and it has to allocate knowledge embedded in scarce and valuable human capital across global operations (Lewin et al., 2009). As MNEs' optimal use of (firm-specific) human capital to integrate and exploit diverse knowledge resources is essential in human resource management aimed at building a sustainable competitive advantage (Campbell, Coff, & Kryscynski, 2012; Narula, Asmussen, Chi, & Kundu, 2019), where to employ foreign workers is a key coordination issue for the MNE.

MNEs can employ foreign workers in two ways. First, they may move close to the sources of foreign talent by establishing foreign subsidiaries and employing local employees there, and second, they may employ migrant foreign workers in their home country (Breschi & Lissoni, 2009). The different mechanisms suggested in the three strands of literature posit influences that lead to either a complementary or a substitution relationship between domestic and foreign employment growth of foreign workers, with a priori an ambiguous net effect. Domestic and foreign employment growth may be complements if migrants employed domestically can assist with foreign expansion (Foley & Kerr, 2013), but they can also be substitutes because MNEs move value-added activities and employment across locations to respond to local needs and opportunities (Harrison & McMillan, 2011; Kovak et al., 2021; Stahl et al., 2012). We therefore do not posit a baseline hypothesis on the relationship between foreign and domestic employment growth of foreign workers, but develop a theoretical framework based on the knowledge-based view juxtaposing the different mechanisms influencing MNEs' employment decisions. We formulate hypotheses concerning the conditions under which each – complementary or substituting – mechanism is expected to be stronger or weaker. We consider contextual knowledge complementarity, activity substitution, and human capital substitution.

Contextual knowledge complementarity

When conducting FDI and expanding employment abroad, it is important that the MNE has knowledge of the foreign market and work practices (Foad, 2012; Javorcik et al., 2011). Such location-specific knowledge is partly tacit in nature and embedded in host-country workers that have acquired it by engaging in meaningful interactions with local actors (Morris, Snell, & Björkman, 2016). The knowledge-based view of the MNE (Almeida et al., 2002; Kogut & Zander, 1993) holds that MNEs are well positioned to access and transfer tacit knowledge embedded in individuals across national borders. One important channel for an MNE to access contextual knowledge about foreign markets is the employment of migrants in the MNE's home operations. By employing migrants domestically, an MNE can learn about the functioning of foreign

markets, get access to foreign networks, and can better identify products and services that could be developed to meet foreign demand (Breschi & Lissoni, 2009). This learning can be both direct – by relying on the knowledge of the migrant employees – but also indirect – by leveraging the knowledge of local co-national immigrant communities to which migrant employees have preferential access (Foley & Kerr, 2013; Hernandez & Kulchina, 2020; Kunczer et al., 2019). By employing migrants in home operations, an MNE will be better able to filter and interpret information from a host country and steer the affiliate strategy in an appropriate direction reflective of country-specific labor market conditions and regulatory context (Javorcik et al., 2011). While domestic employment of migrants facilitates foreign expansion, host-country expansion of employment will make it more likely that the MNE sees the need to assure requisite contextual knowledge in domestic operations through migrant employment.

The need to employ migrants in the domestic operations of an MNE to facilitate employment expansion abroad is larger when a MNE has limited knowledge about a foreign location due to linguistic, institutional, and cultural dissimilarities with the home country. Differences in institutional context manifest themselves in several forms, such as the political system, governance system and economic environment across countries (Beugelsdijk, Nell, & Ambos, 2017). Cultural differences refer to dissimilarities between countries in time orientation, gender roles, assertiveness, and individualism (Hofstede, Hofstede, & Minkov, 2010). Language differences involve the distance in major languages between two countries (Dow & Amal, 2006). The literature has subsumed differences in culture, institutional context and language into a composite concept termed 'contextual distance' (Belderbos, Grabowska, Kelchtermans, Leten, Jacob, & Riccaboni, 2021; Beugelsdijk et al., 2017). Given the stronger needs to employ migrants in the MNE's home country to expand foreign employment in contextually distant locations, contextual distance is likely to be associated with a stronger complementary relationship between the growth of domestic and foreign employment of foreign workers.

The knowledge-based view of the firm also emphasizes the importance of knowledge variety for organizational learning (Morris et al., 2016). By employing workers of different nationalities and cultures – rather than solely employing native workers in the home country – and creating a diverse work environment, firms can increase knowledge (re)combination (Laursen et al., 2020; Vora et al., 2019) and can build a corporate culture and develop decision-making practice that emphasizes entrepreneurial activities (Boone, Lokshin, Guenter, & Belderbos, 2019) such as foreign expansion. Such diversity-related benefits of hiring migrants are increasing in the contextual distance between local and migrant employees. Expansion of employment in a host country at greater contextual distance increases the importance of having diversity in the decision-making and coordination efforts in the home country of the MNE. These mechanisms suggest the following hypothesis:

Hypothesis 1: A multinational firm's domestic employment growth of migrants from a focal foreign country (domestic employment growth) and employment expansion of foreign affiliates of the firm in that country (foreign employment growth) are more likely to be complements if the home and host country have a larger contextual distance.

Activity substitution

A focal point of attention in the knowledge-based view of the MNE (Almeida et al., 2002; Foss et al., 2013; Kogut & Zander, 1993) is where to locate activities in order to maximize the sourcing, transfer, and exploitation of knowledge. By leveraging location-specific advantages, such as access to qualified labor at low costs (Lewin et al., 2009), MNEs can create a competitive advantage by combining firm-specific advantages – that are a function of the knowledge embedded in their employees (Narula et al., 2019) – with location-specific advantages. A strand of literature on the labor demand of MNEs across locations has emphasized the potential substitution between foreign and domestic employment expansion in response to labor cost differences (Harrison & McMillan, 2011; Olney & Pozzoli, 2021). Substitution can be derived from the cost minimization problem across locations whereby MNEs decide where to locate value-added activities taking into account domestic and foreign employment conditions as well as other country circumstances. Activity substitution is the result of choosing the optimal location for MNEs' activities, from which employment consequences follow.

Yet, such a substitution effect is not expected to be uniform, as the motivation for foreign affiliate expansions can differ. There are two generic motivations for such expansion and FDI: to source (labor) inputs (often at lower costs) and to sell output (Brouthers, Werner, & Wilkinson, 1996). These two broad motivations are often labelled as *factor-seeking* versus *market-seeking* FDI. While factor-seeking foreign investments allow MNEs to take advantage of local low-cost labor inputs, market-seeking foreign investments are undertaken to penetrate foreign markets. Studies have confirmed differences in domestic employment effects of foreign investments depending on the type and motivation, with cost-reduction driven investments more likely to lead to a negative, substitutive relationship with domestic employment (Harrison & McMillan, 2011; Kovak et al., 2021) and substitution a function of different skill endowments and wage levels across locations (Olney & Pozzoli, 2021).

On the one hand, if foreign investments are for offshoring domestic operations at lower costs in low-wage countries, foreign employment growth substitutes for domestic employment, including migrants. On the other hand, if FDI is geared towards market expansion, which often entails investing in distribution, assembly, or marketing in high-wage countries with high purchasing power (Brouthers et al., 1996), foreign employment expansion is likely to facilitate exports of final goods, intermediates, and services from the home country. To accommodate increased exports to a host country, MNEs can employ migrants domestically to rely on their know-how on the functioning of local markets and local (import) regulations. Hence, market-seeking FDI to high-wage countries is expected to complement the domestic employment of migrants from those countries. It follows that activity substitution is more likely if foreign affiliate operations have a factor seeking FDI motivation associated with larger differences in labor costs between home and host countries. This suggests the following hypothesis:

Hypothesis 2: A multinational firm's domestic employment growth of migrants from a focal foreign country (domestic employment growth) and employment expansion of foreign affiliates of the firm in that country (foreign employment growth) are more likely to be substitutes, the larger the wage cost differential between the home and the host country.

Human capital substitution

Even if a MNE would have allocated activities across locations in an optimal manner, its global talent management under conditions of scarce labor (Stahl et al., 2012) may still lead to substitution at the employee level. A migrant with specific skills who is employed in the local affiliate cannot be employed in the MNE's home operations, and it may be difficult and expensive, and require extensive search, to find and employ someone with a comparable skill set and contextual knowledge for home operations. The knowledge-based view of the MNE (Morris et al., 2016) holds that organizing and managing talent globally – by coordinating employment decisions across locations and subsidiaries – is a core organizational capability that is difficult to observe and imitate and therefore a source of sustainable competitive advantage for MNEs. While such global coordination of recruitment is costly and difficult to organize, case-based evidence on selected MNEs suggests that if labor scarcity is an issue and human capital a core resource, firms aim for global hiring. A case in point is the Dutch global market leader in semiconductor equipment ASML, which employs over 100 nationalities in its home operations near Eindhoven in the Netherlands but also recruits from Eindhoven for development and service operations in other countries, such as Taiwan and the U.S.[1] A study by McKinsey & Co. (Dewhurst, Pettigrew, & Srinivasan, 2012) suggest that companies such as the German publisher Bertelsmann hire specific foreign talent at its corporate headquarters, to relocate these migrants after several years to operations in their country of origin. The Dutch medical technology firm Philips takes pride in its "total workforce strategy", which considers "all sources of skills, capabilities, locations and changes in the labor market" for an optimal allocation and composition of its workforce, steering improvements in workforce composition towards the "right shore" (domestic or foreign) in its "right shoring & sourcing" program.[2]

We expect that global talent management and globally coordinated hiring decisions are most likely to be relevant for MNE operations with a high demand for the highly skilled. Highly-skilled

employees are particularly mobile in their locations of work as their skills can be used in different work environments (Kerr et al., 2016). As a result, migration is a stronger feature of high-skilled labor than of low-skilled labor (Kerr et al., 2016), and this occurs, in particular, when high-skilled migrants are employed in knowledge-intensive environments (Useche, Miguelez, & Lissoni, 2019). In contrast, lower-skilled employees tend to be less internationally mobile, if only because the barriers to international mobility due to migration policies favoring knowledge workers are higher. Given the higher mobility and wider employability of high-skilled workers, global talent management and human capital substitution is more likely when foreign and domestic operations of the MNE are highly skill-intensive.

The greater mobility, employability, scarcity, and search costs regarding highly skilled workers suggest that global allocation and coordination decisions related to global talent management and employment of foreign nationals are much more salient when MNEs employ for highly skill-intensive operations at home and abroad. We hypothesize:

Hypothesis 3: A multinational firm's domestic employment growth of migrants from a focal foreign country (domestic employment growth) and employment expansion of foreign affiliates of the firm in that country (foreign employment growth) are more likely to be substitutes if the operations of the MNE are more skill-intensive.

EMPIRICAL MODEL

Our theoretical framework drawing on the extant literature on MNEs' employment behavior across locations (Harrison & McMillan, 2011) and global talent management (Al Ariss et al., 2014; Stahl et al., 2012) suggests that employment expansion decisions of foreign workers abroad and domestically are taken simultaneously by MNEs. We model the two employment growth decisions as a system of simultaneous equations. The first equation has the growth of employees in the firms' affiliate(s) in the foreign country as the dependent variable. The second equation uses the MNE's growth of migrant employees from the foreign country at home as the dependent variable.

$$\begin{aligned}\text{Foreign employment growth}_{i,j,t} &= \beta_0 + \beta_D\ \text{Domestic employment growth}_{i,j,t} \\ &+ \beta_{DM}\ \text{Domestic employment growth}_{i,j,t} \times M_{i,j,t} \\ &+ \beta_Z Z_{i,j,t-1} + \alpha_i + \omega_t + \varepsilon_{i,j,t}\end{aligned} \tag{1}$$

$$\begin{aligned}\text{Domestic employment growth}_{i,j,t} &= \beta_1 + \beta_F \text{Foreign employment growth}_{i,j,t} \\ &+ \beta_{FM} \text{Foreign employment growth}_{i,j,t} \times M_{i,j,t} \\ &+ \beta_W W_{i,j,t-1} + \alpha\prime_i + \omega\prime_t + \varphi_{i,j,t}\end{aligned} \tag{2}$$

In these equations, Foreign employment growth$_{i,j,t}$ refers to the growth of foreign employees of firm i in country j in year t, and Domestic employment growth$_{i,j,t}$ refers to the growth of migrants, who originate from country j and are employed by firm i in the Netherlands, in year t. The variables M are moderators of the foreign–domestic employment growth relationships testing for the hypotheses. $Z_{i,j,t-1}$ and $W_{i,j,t-1}$ are two vectors of firm and country characteristics that influence foreign and domestic employment growth. These include characteristics that serve as instruments for the two employment growth variables and allow identification of the model, such as labor market regulations and conditions. In our conceptualization, exogenous drivers of domestic and foreign employment and 'shocks' to these exogenous drivers impact MNEs' desired local employment growth. This growth at home (abroad) subsequently affects employment growth abroad (at home) allowing us to identify whether these relationships act like substitutes or complements. The parameters. α_i and ω_t and $\alpha\prime_i + \omega\prime_t$ are firm and year fixed effects, and $\varepsilon_{i,j,t}$ and $\varphi_{i,j,t}$ are the error terms.

DATA, VARIABLES AND METHODS

We constructed a dataset on MNEs headquartered in the Netherlands with subsidiaries in non-EU countries during the period 2008–2016. We draw on microdata available at Statistics Netherlands. We combine Dutch employer–employee data with migration data at the individual level to construct firm-level measures of the yearly domestic employment growth of migrants differentiated by their country of origin. Data on foreign affiliate employment comes from the Foreign Affiliate Trade

Statistics (FATS) available at Statistics Netherlands. We restrict our sample to those firm–country pairs for which firms have foreign affiliate operations, leading to an unbalanced sample of 1940 MNEs active in one or more of 54 non-EU countries.

Table 1 shows the top 15 countries of origin of migrant employees for the MNEs and the top 15 host countries of foreign subsidiaries in terms of employment. The U.S. and China are the two most important countries for foreign subsidiary employment and the supply of non-EU immigrants to the Dutch MNEs' operations in the Netherlands. Other non-EU countries that rank high in terms of subsidiary employment are Brazil, Mexico, and India. Indonesia, India, and Australia complete the top 5 non-EU countries sending most migrants to be employed by the focal MNEs. In terms of the number of observations on employment growth decisions in our dataset, the U.S. is less dominant, representing 24% of observations.

Dependent Variables

The dependent variable *foreign employment growth* is measured as the proportional growth of the MNE's employees in the foreign country between years $t-1$ and t. Similarly, *domestic employment growth* is measured as the proportional growth of migrant employees originating from the foreign country working in domestic operations of the firm. Migrant employees do not include returning emigrants or expatriate workers, which are native workers who returned to the Netherlands after a foreign stay. The proportional growth is measured as the log difference between the employment levels in the two years. A value 1 is assigned to employment levels before the logarithmic transformations.

Hypotheses Testing Variables (Moderators)

We measure *contextual distance* as a principal component of institutional distance, cultural distance, and language distance, following prior studies (e.g., Belderbos et al., 2021). Institutional distance is taken from the World Bank Worldwide Governance and consists of six dimensions: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. Cultural distance is taken from Hofstede et al. (2010), and includes the six cultural dimensions: Power Distance, Uncertainty Avoidance, Individualism-Collectivism, Masculinity-Femininity, Long-term Orientation-Short-term Orientation, and Indulgence-Restraint. Language distance is taken from Dow and Amal (2006) and represents the closeness between languages and the frequency that the language of one country is spoken in the other country.

The institutional distance and cultural distance dimensions are aggregated into two measures of institutional distance and cultural distance using the method of Kogut and Singh (1988). Contextual distance then is the principle component of institutional, cultural and language distance of the 54 host countries with the Netherlands. Hypothesis 1 predicts that the interaction of this contextual distance variable with foreign and domestic employment growth in respectively the domestic and foreign employment growth equations is positive, i.e., contextual distance leads to a complementary relationship between foreign and domestic employment growth.

The *labor cost differential*, capturing cost-reducing motivations for FDI, is the logarithm of the ratio of the average annual earning of non-EU migrant workers in the Netherlands to the average annual earning of workers in the country of the foreign affiliate. Information on average annual earnings across countries is drawn from UBS earnings reports, while Statistics Netherlands provided data on average annual earnings of migrants in the Netherlands. Hypothesis 2 suggests that the greater the labor cost differential (the lower the wage costs in the country of the foreign affiliate) the more likely it is that domestic and foreign employment growth are substitutes. Hence it predicts a negative interaction effect with foreign and domestic employment growth in respectively the domestic and foreign employment growth equations.

We measure skill-intensive operations by the *R&D intensity* (R&D expenditures as a ratio to turnover) of the firm drawing on R&D and Community Innovation Survey data available at Statistics Netherlands. R&D-intensive firms are more likely to require highly skilled workers, engineers, and scientists. We require that the firm be active in R&D both at home and in the migrants' country of origin, to ensure that employment in both locations is R&D-intensive. For foreign affiliates, we use information on R&D activities in the sector classification augmented with inventor location data on the firm's patent applications. Hypothesis 3 predicts that the interaction effects of *R&D intensity* with foreign and domestic employment growth in

Table 1 Foreign affiliate employment and migrant employment shares by country, 2008–2016

Country	Share of affiliate employment (%)	Share of migrant employment (%)	Share of observations (%)
U.S.	40.16	31.28	24.17
China	11.45	14.25	13.13
Brazil	6.69	4.17	3.23
Mexico	4.73	0.50	1.96
India	3.62	6.13	4.76
Thailand	2.71	3.06	2.01
Canada	2.52	4.30	4.49
Australia	2.40	5.63	3.59
Singapore	2.37	2.30	5.49
Indonesia	2.36	13.41	2.02
Philippines	1.67	0.76	0.83
Malaysia	1.45	0.93	3.08
Japan	1.24	0.44	2.46
South Africa	1.12	4.49	3.81
Vietnam	1.08	0.76	1.33
Others	14.44	7.58	23.63
Total	100.00	100.00	100.00

respectively the domestic and foreign employment growth equations are negative.

Instrumental Variables

Key variables in the system of equations are characteristics of the home and foreign countries that can serve as exogenous influences in the foreign and domestic employment growth equations. For domestic employment growth, we use the lagged stock of immigrants from the foreign country and industry-level labor scarcity. Immigrants may be attracted to settle in areas with a high concentration of immigrants with the same cultural and linguistic background (Olney & Pozzoli, 2021). Hence, previous studies have used pre-existing communities of immigrants from a country to predict inflows of immigrants (e.g., Card, 2005). The stock of foreign migrant workers is exogenous to the firm and will facilitate domestic employment of foreign workers at lower cost, as it avoids moving and resettling costs. We use the natural logarithm of the *focal migrant stock at home* (excluding those employed in the focal firm) as a predictor for the domestic employment growth of foreign workers. As second instrument, we use industry-level labor scarcity *industry unfilled vacancies at home*, which is measured by the number of unfilled vacancies in the main (1-digit NACE) industry of the MNE (in natural logarithm).

For foreign employment growth, we use as instruments labor market efficiency and market potential. The efficiency level of the labor market has been shown to be a determinant of the employment level in a foreign country (Nunziata, 2003) and will be an important determinant of foreign employment expansion decisions of MNEs. The yearly *Labor market efficiency in the migrant country* is the score of the country taken from the World Economic Forum. This score ranges from 1 (worst) to 7 (best) based on criteria such as employee–employer relations, the flexibility of wage determination, hiring and firing practices, redundancy costs, and the effects of taxation on incentives to work. A high labor market efficiency score implies easier hiring and retention, but also firing of employees, providing employers with more flexibility. Regulatory change regarding the foreign labor market can be regarded as exogenous shocks affecting local employment conditions, but having no direct effect on domestic employment.

Increases in a foreign country's *market potential* will provide MNEs with the incentives to expand employment in its affiliates (Belderbos et al., 2013; Brouthers et al., 1996). We take a broad measure of market potential reflecting not only local demand but also the openness of the economy. Market potential is a composite measure of the World Economic Forum that includes the size of the market in terms of GDP and the value of imports and exports of goods and services. A high value of market potential implies greater opportunities for MNEs to expand employment in foreign affiliates in that country. Thus, it can be considered as an

exogenous factor that impacts local employment decisions of MNEs.

Control Variables

The two employment growth equations are augmented with variables representing other potential influences on domestic and foreign employment growth. Employment growth, in proportional terms, is likely to be affected by the past (level of) employment. We therefore include the *firm focal migrants at home* from the foreign country and the *firm employees in the migrant country* (in the previous year, in natural logarithm) in the domestic and foreign employment growth equations, respectively.

We include several other firm-level controls. We include *firm diversification at home* in the domestic employment growth equation, measured by the number of industries in which the firm is active in the Netherlands, distinguishing 64 NACE2 industries. Similarly, *firm diversification in the migrant country* is the number of industries in which the firm is active in the foreign country. The intensity of the MNE's trade with the foreign country may be associated with more employment of workers in or from that country (Rauch & Trindade, 2002), hence we include the variable *firm trade with migrant country*, which is the natural logarithm of the ratio of the MNE's import and export with the foreign country to the MNE's turnover. We include the variable *firm geographic spread,* measured as the number of foreign countries where the MNE operates subsidiaries. A higher *firm total factor productivity (TFP) growth* of the firm may allow for employment growth across locations.[3] We include the number of *firm EU employees at home* (employees with the Dutch or EU nationality, in logarithm) in both the foreign and domestic employment growth equation as an employment scale indicator independent of focal employment growth (which focuses on non-EU countries only). In both the domestic and foreign employment growth equations we control for market growth. In the domestic employment growth equation, we include an indicator of the growth of the domestic market, measured by the annual *industry growth at home* (growth in value added) of the main sector of the MNE in the Netherlands. In the foreign employment growth equation, we include an indicator of the growth of the local market, which may lead MNEs to expand their local operations (Janicki & Wunnava, 2004): the country's annual *GDP growth* (taken from the World Development Indicators). Firms with a diverse employee base may have more experience in recruiting and integrating migrants in domestic operations (Laursen et al., 2020). We therefore control in the domestic employment growth equation for *firm diversity of migrants at home*, measured as 1 minus the Herfindahl index of the concentration of existing migrants' by countries of origin. Finally, the empirical models also include the main effects of the moderators *contextual distance, wage cost differential,* and *R&D intensity*.

Methods

We estimate the system of Eqs. (1) and (2) using three-stage least squares (3SLS) models. By taking into account common factors affecting both domestic and foreign employment growth, 3SLS provides more efficient estimators than 2SLS (Zellner & Theil, 1992). As common unobserved factors may exist that influence both foreign and domestic employment decisions, such as MNEs' human resource management practices, the system allows controlling for correlations in the error terms $\varepsilon_{i,j,t}$ and $\varphi_{i,j,t}$. In 3SLS, the two dependent variables are regressed on all exogenous variables in the system (including the instruments) to obtain the covariance matrix of disturbances, after which generalized least squares system estimation is performed using this covariance matrix and the instrumented values of the dependent variables.

Our analysis also controls for potential selection bias. If a firm does not operate an affiliate in a foreign country it is impossible to analyze relationships between domestic and foreign employment growth; hence in this sense there is a necessary selection of host countries that cannot be avoided. The analysis does include observation years without a foreign affiliate, since we include all observations for a firm–host country pair as long as during the sample period affiliate activity is reported. Yet the selection of countries may lead to biased estimates if the selection process is correlated with omitted country or firm variables that also affect substitution or complementarity of domestic and foreign employment growth. We therefore estimate a Heckman selection model that explains host-country choices for foreign affiliates, and add the inverse mills ratio (*Inverse Mills)* from the selection model to both employment growth equations in our 3SLS model to control for potential selection bias. Informative selection models require exclusion restrictions: first-stage variables that influence the selection decision but that do not influence the

second-stage dependent variables (Certo, Busenbark, Woo, & Semadeni, 2016). The first-stage analysis therefore includes FDI openness and capital flow openness as host-country variables and exclusion restrictions that drive foreign investment and country location choice decisions, but that are not conceivable influences on subsequent employment growth.[4]

Second, our models assume the absence of systematic correlations between the error terms of the employment growth equations for the different countries in which the firm is active and for which migrant employment is analyzed. One can imagine, however, that migrants from different countries of origin may substitute or complement each other, or that employment growth decisions are driven by similar unobserved shocks. This may be especially the case for employees of countries that are similar to each other. To allow for such 'common influences' between employment growth decisions of MNEs across workers from different countries, we augment the 3SLS models by adding to the domestic and foreign employment growth equations a 'spatially lagged' dependent variable with weights reflecting the inverse of the contextual distance between countries. We follow the spatial econometrics literature (e.g., Jeanty, Partridge, & Irwin, 2010) and include the weighted sum of domestic (foreign) employment growth of other countries in which the firm is active, which we term s*patial lag*.[5]

EMPIRICAL RESULTS

Table 2 shows summary statistics and correlations of the variables, for the domestic employment growth equation (panel A) and the foreign employment growth equation (panel B). Since we adopt linear models with firm fixed effects, we report within-correlations (with variables demeaned at the firm level) in the table. On average, MNEs' yearly country growth of migrant employees in their operation in the Netherlands is 0.1%, while the yearly employee growth of the MNEs abroad is substantially higher, at 5.8%. There is a negative correlation (− 0.047) between the growth of the firm's employees in the foreign country and the growth of the firm's migrants from the foreign country, providing some prima facie evidence of potential substitution. Generally, we observe low correlation coefficients for the explanatory variables. VIF scores are 1.71 and 1.49 for the foreign and domestic equations, respectively, and indicate no multicollinearity concerns. The MNEs operate, on average, in 8.9 countries abroad. The average labor market efficiency index of foreign countries in which the MNEs operate is nearly equal to 5 (on a scale from 1 to 7), which indicates a reasonably high-efficiency level of the foreign labor markets in which firms invest.

Table 3 provides the results of the three-stage least-squared estimation of domestic and foreign employment growth. Models 1A and 1B report results for the basic model. Two out of four instrumental variables are significant with the correct sign: market potential in the foreign employment growth equation, and the immigrant stock in the domestic employment growth equation. Labor market efficiency and industry-level unfilled vacancies are not significant in the foreign and domestic employment growth equations, respectively. We conducted a number of statistical tests to assess the relevance and exogeneity of our instruments, following the recommendations by Bascle (2008). The Sargan tests showed insignificance, rejecting the null hypothesis of overidentification (endogeneity): a chi-square test statistic of 0.014 (p = 0.907) for the foreign employment growth equation and a chi-square test statistic of 2.275 (p = 0.132) for the domestic employment growth equation. The difference-in-Sargan test also confirmed the exogeneity: a chi-square test statistic of 2.275 (p = 0.132) and 0.014 (p = 0.907) in the foreign and domestic equations, respectively. The Anderson likelihood ratio test for the explanatory power of the exogenous variables (e.g., Baum, Schaffer, & Stillman, 2007) rejected the null hypothesis of under-identification: chi-square = 68.34 ($p < 0.001$) and chi-square = 6.82 ($p < 0.05$) in the foreign and domestic equations, respectively. The first-stage F-statistic for instrument validity of 29.92 ($p < 0.001$) and 12.78 ($p < 0.001$) in the foreign and domestic equations, pass the critical threshold value of 10 (Stock & Yogo, 2005) and suggest that the instruments are sufficiently strong.

In the foreign employment growth equation, TFP growth, firm trade with the migrant country and the scale of EU personnel employment at home are significant and positively associated with employment expansion, while the number of existing employees and geographic spread of the MNE are significantly negatively associated with employment growth. In the domestic employment growth equation, a marginally significant positive association is found for the diversity of the firm's migrant labor force, while domestic employment growth is

Table 2 Summary statistics and correlations (N = 15592)

		Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Domestic Employment growth equation										
(1)	Domestic employment growth	0.001	0.238							
(2)	Foreign employment growth	0.058	0.570	− 0.047						
(3)	Firm focal migrants at home	0.150	0.511	0.271	− 0.004					
(4)	Focal migrant stock at home	6.456	2.534	0.004	0.030	0.149				
(5)	Industry unfilled vacancies at home	9.308	0.743	0.013	0.007	0.007	0.032			
(6)	Firm diversification at home	2.942	3.966	− 0.009	− 0.010	0.040	0.157	− 0.004		
(7)	Industry growth at home	0.020	0.046	− 0.005	0.013	0.005	0.134	0.164	− 0.013	
(8)	Firm diversity of migrants at home	0.820	0.355	− 0.013	0.026	0.030	0.816	0.017	0.180	0.126
(9)	Firm TFP growth	0.002	0.030	− 0.006	0.015	− 0.002	0.022	0.169	− 0.002	0.009
(10)	Firm geographic spread	8.936	12.826	− 0.013	0.056	0.093	0.260	0.010	0.418	− 0.005
(11)	Firm trade with migrant country	2.114	2.851	0.006	− 0.031	0.028	0.059	− 0.058	0.065	− 0.006
(12)	Firm EU employees at home	4.880	2.537	0.005	0.011	0.029	0.117	0.007	0.012	0.003
(13)	Contextual distance	− 0.612	1.019	0.003	− 0.002	− 0.090	− 0.032	− 0.009	− 0.019	− 0.001
(14)	Wage differential	0.104	0.603	− 0.002	0.005	0.045	0.391	0.033	− 0.032	0.064
(15)	R&D intensity	0.481	2.262	0.021	− 0.006	0.253	0.060	0.007	0.032	0.007
(16)	Inverse Mills ratio	0.277	0.165	− 0.004	− 0.007	− 0.031	− 0.120	0.010	− 0.094	0.000
(17)	Spatial lag of domestic employment growth	− 0.328	44.841	0.053	− 0.069	0.007	− 0.002	− 0.003	0.009	− 0.000
		(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(9)	Firm TFP growth	0.005								
(10)	Firm geographic spread	0.282	− 0.006							
(11)	Firm trade with migrant country	− 0.012	0.008	− 0.021						
(12)	Firm EU employees at home	0.109	0.045	0.064	0.126					
(13)	Contextual distance	− 0.018	− 0.003	− 0.037	0.019	0.002				
(14)	Wage differential	0.365	0.023	− 0.014	− 0.018	0.374	0.103			
(15)	R&D intensity	− 0.014	− 0.001	0.034	0.058	− 0.017	− 0.127	− 0.053		
(16)	Inverse Mills ratio	− 0.010	0.005	− 0.068	− 0.301	− 0.033	0.209	0.027	− 0.223	
(17)	Spatial lag of domestic employment growth	− 0.001	0.001	− 0.025	0.001	0.001	− 0.006	− 0.003	− 0.001	− 0.007
		Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel B: Foreign employment growth equation										
(1)	Foreign employment growth	0.058	0.570							
(2)	Domestic employment growth	0.001	0.238	− 0.047						
(3)	Firm employees migrant country	3.193	1.735	0.189	0.018					
(4)	Market potential migrant country	5.692	1.109	0.015	0.019	0.308				
(5)	Labor market efficiency migrant country	4.788	0.700	0.005	− 0.001	0.150	0.274			
(6)	GDP growth migrant country	− 0.006	0.087	0.024	− 0.003	− 0.015	0.016	0.057		
(7)	Firm diversification migrant country	1.083	0.399	0.020	0.007	0.435	0.321	0.222	0.014	
(8)	Firm diversity of migrants at home	0.820	0.355	0.026	− 0.013	0.142	0.006	0.015	− 0.002	0.050
(9)	Firm TFP growth	0.002	0.030	0.015	− 0.006	0.002	0.001	− 0.001	0.000	0.006
(10)	Firm geographic spread	8.936	12.826	0.056	− 0.013	0.306	0.104	0.059	− 0.027	0.233

Table 2 (*Continued*)

		Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(11)	Firm trade with migrant country	2.114	2.851	− 0.031	0.006	0.064	0.251	0.125	0.047	0.164
(12)	Firm EU employees at home	4.880	2.537	0.011	0.005	0.178	0.032	0.015	− 0.013	− 0.003
(13)	Contextual distance	− 0.612	1.019	− 0.002	0.003	− 0.081	− 0.069	− 0.524	0.115	− 0.081
(14)	Wage differential	0.104	0.603	0.005	− 0.002	0.270	− 0.011	− 0.137	− 0.027	0.035
(15)	R&D intensity	0.481	2.262	− 0.006	0.021	0.205	0.214	0.161	0.001	0.269
(16)	Inverse Mills ratio	0.277	0.165	− 0.007	− 0.004	− 0.253	− 0.611	− 0.670	− 0.061	− 0.351
(17)	Spatial lag of foreign employment growth	0.069	8.914	0.067	− 0.036	− 0.010	− 0.001	0.003	0.003	0.001

		(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(9)	Firm TFP growth	0.005								
(10)	Firm geographic spread	0.282	− 0.006							
(11)	Firm trade with migrant country	− 0.012	0.008	− 0.021						
(12)	Firm EU employees at home	0.109	0.045	0.064	0.126					
(13)	Contextual distance	− 0.018	− 0.003	− 0.037	0.019	0.002				
(14)	Wage differential	0.365	0.023	− 0.014	− 0.018	0.374	0.103			
(15)	R&D intensity	− 0.014	− 0.001	0.034	0.058	− 0.017	− 0.127	− 0.053		
(16)	Inverse Mills ratio	− 0.010	0.005	− 0.068	− 0.301	− 0.033	0.209	0.027	− 0.223	
(17)	Spatial lag of foreign employment growth	0.002	− 0.001	0.022	0.002	0.001	0.001	0.000	− 0.006	− 0.007

Correlations are within-correlations of variables demeaned at the firm level

negatively associated with the existing employment of migrants from the focal country at home, the geographic spread of the firm, and contextual distance.

The main effects of the moderator variables show a symmetric positive association between employment growth and R&D intensity, and a negative association between domestic employment growth and contextual distance, which appears intuitive and related to the better growth prospects of R&D intensive firms and the more difficult employment expansion and integration due to contextual distance. The wage differential exerts a marginally significant positive effect on foreign affiliate employment growth, suggesting cost motivations.

The Inverse Mills ratio is only significant in the domestic employment growth equation: unobserved heterogeneity leading to selection appears more a feature of the domestic than the foreign employment growth equation. The coefficients on the spatial lag are consistently positive and significant in both equations, suggesting that unobserved common factors are present that drive domestic and foreign employment growth decisions across countries.

Foreign and domestic employment growth have a negative and significant coefficient in the domestic and foreign employment growth equations, respectively ($\beta_F = -0.074$, $p<0.001$, and $\beta_D = -0.285$, $p < 0.001$). This suggests that the two channels of employment growth act as substitutes on average. Since the foreign and domestic employment growth variables are expressed as proportional growth terms, the coefficients can be interpreted as elasticities. In model 1A, a 1% increase in domestic employment growth decreases foreign employment growth by 0.29%, while in model 1B, a 1% increase in foreign employment growth decreases domestic employment growth by 0.08%. Hence, the substitution effect of domestic employment growth on foreign employment growth appears to be substantially larger than the substitution effect of foreign employment growth on domestic employment growth. This is likely to be the result of the different dimensions of employment domestically and abroad. Whilst domestic employment growth of migrants of one country only refers to a – in most cases – minor share of domestic employment, foreign employment growth refers to growth in the total employee base of foreign affiliates. It also indicates that foreign affiliate

Table 3 Three-stage least square estimations of domestic and foreign employment growth

	Foreign employment growth					Domestic employment growth				
	Model 1A	Model 2A	Model 3A	Model 4A	Model 5A	Model 1B	Model 2B	Model 3B	Model 4B	Model 5B
Domestic employment growth	− 0.285	− 0.166	− 0.329	− 0.216	− 0.093					
	(0.051)	(0.068)	(0.053)	(0.057)	(0.091)					
	[0.000]	[0.015]	[0.000]	[0.000]	[0.308]					
Domestic employment growth*Contextual distance		0.215			0.400					
		(0.031)			(0.050)					
		[0.000]			[0.000]					
Domestic employment growth*Wage differential			− 0.122		− 0.472					
			(0.026)		(0.059)					
			[0.000]		[0.000]					
Domestic employment growth*R&D intensity				− 0.024	− 0.016					
				(0.006)	(0.005)					
				[0.000]	[0.002]					
Foreign employment growth						− 0.074	− 0.053	− 0.075	− 0.065	− 0.009
						(0.011)	(0.017)	(0.011)	(0.011)	(0.023)
						[0.000]	[0.001]	[0.000]	[0.000]	[0.695]
Foreign employment growth*Contextual distance							0.038			0.094
							(0.009)			(0.015)
							[0.000]			[0.000]
Foreign employment growth*Wage differential								− 0.030		− 0.110
								(0.006)		(0.016)
								[0.000]		[0.000]
Foreign employment growth*R&D intensity									− 0.003	− 0.003
									(0.002)	(0.001)
									[0.058]	[0.065]
Market potential migrant country	0.053	0.053	0.052	0.053	0.052					
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)					
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]					
Labor market efficiency migrant country	0.015	0.014	0.013	0.016	0.010					
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)					
	[0.430]	[0.458]	[0.485]	[0.395]	[0.596]					
GDP growth migrant country	0.046	0.055	0.045	0.051	0.067					
	(0.061)	(0.061)	(0.060)	(0.061)	(0.060)					
	[0.448]	[0.364]	[0.454]	[0.403]	[0.269]					
Firm employees migrant country	− 0.168	− 0.168	− 0.167	− 0.169	− 0.165					
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)					
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]					
Firm diversification migrant country	0.076	0.074	0.074	0.078	0.072					
	(0.015)	(0.014)	(0.014)	(0.015)	(0.014)					
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]					

Table 3 (*Continued*)

	Foreign employment growth					Domestic employment growth				
	Model 1A	Model 2A	Model 3A	Model 4A	Model 5A	Model 1B	Model 2B	Model 3B	Model 4B	Model 5B
Spatial lags of foreign employment growth	0.003	0.003	0.002	0.003	0.002					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]					
Spatial lags of domestic employment growth						0.000	0.000	0.000	0.000	0.000
						(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
						[0.000]	[0.000]	[0.000]	[0.000]	[0.016]
Focal migrant stock at home						0.035	0.035	0.034	0.035	0.034
						(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
						[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Industry unfilled vacancies at home						− 0.004	− 0.004	− 0.004	− 0.004	− 0.004
						(0.006)	(0.006)	(0.005)	(0.006)	(0.005)
						[0.437]	[0.465]	[0.426]	[0.439]	[0.472]
Firm focal migrants at home						− 0.211	− 0.210	− 0.209	− 0.212	− 0.205
						(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
						[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm diversification at home						− 0.001	− 0.001	− 0.001	− 0.001	− 0.000
						(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
						[0.613]	[0.684]	[0.612]	[0.627]	[0.828]
Industry growth at home						− 0.087	− 0.089	− 0.086	− 0.087	− 0.088
						(0.054)	(0.054)	(0.053)	(0.054)	(0.054)
						[0.106]	[0.100]	[0.107]	[0.108]	[0.102]
Firm diversity of migrants at home	0.022	0.022	0.024	0.019	0.028	0.038	0.040	0.038	0.039	0.039
	(0.037)	(0.037)	(0.037)	(0.037)	(0.038)	(0.015)	(0.016)	(0.016)	(0.015)	(0.016)
	[0.563]	[0.552]	[0.517]	[0.611]	[0.456]	[0.013]	[0.011]	[0.016]	[0.012]	[0.015]
Firm TFP growth	0.309	0.307	0.310	0.308	0.308	0.036	0.024	0.042	0.033	0.024
	(0.138)	(0.138)	(0.138)	(0.138)	(0.140)	(0.061)	(0.062)	(0.061)	(0.061)	(0.063)
	[0.025]	[0.026]	[0.025]	[0.026]	[0.028]	[0.553]	[0.694]	[0.490]	[0.583]	[0.700]
Firm geographic spread	− 0.012	− 0.013	− 0.012	− 0.012	− 0.012	− 0.005	− 0.005	− 0.005	− 0.005	− 0.006
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm trade migrant country	0.025	0.025	0.025	0.025	0.025	0.003	0.003	0.003	0.003	0.003
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.045]	[0.033]	[0.061]	[0.058]	[0.093]
Firm EU employees at home	0.072	0.069	0.071	0.072	0.065	0.015	0.015	0.016	0.014	0.015
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
	[0.002]	[0.003]	[0.002]	[0.002]	[0.005]	[0.132]	[0.147]	[0.120]	[0.148]	[0.139]
Inverse Mills ratio	0.101	0.106	0.095	0.104	0.095	0.056	0.059	0.054	0.056	0.057
	(0.069)	(0.069)	(0.069)	(0.069)	(0.069)	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)
	[0.145]	[0.126]	[0.170]	[0.135]	[0.170]	[0.003]	[0.002]	[0.005]	[0.003]	[0.004]

Table 3 (*Continued*)

	Foreign employment growth					Domestic employment growth				
	Model 1A	Model 2A	Model 3A	Model 4A	Model 5A	Model 1B	Model 2B	Model 3B	Model 4B	Model 5B
Contextual distance	− 0.017	− 0.017	− 0.017	− 0.017	− 0.018	− 0.006	− 0.007	− 0.006	− 0.006	− 0.009
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.031]	[0.027]	[0.030]	[0.027]	[0.020]	[0.061]	[0.034]	[0.052]	[0.063]	[0.007]
Wage differential	0.032	0.030	0.032	0.034	0.030	− 0.002	− 0.004	0.000	− 0.003	0.003
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)
	[0.079]	[0.095]	[0.081]	[0.063]	[0.101]	[0.764]	[0.619]	[0.961]	[0.722]	[0.701]
R&D intensity	0.012	0.012	0.012	0.012	0.013	0.011	0.011	0.011	0.011	0.011
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm and year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
R−squared	0.176	0.168	0.172	0.176	0.148	0.118	0.110	0.115	0.122	0.088
Chi-square	3478.77	3847.62	3526.12	3593.60	4386.34	2398.67	2842.98	2477.61	2453.08	3456.82
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	15592	15592	15592	15592	15592	15592	15592	15592	15592	15592

Standard errors in parentheses, *p* values in square brackets.

employment is more sensitive to the global employment coordination mechanisms than the domestic employment of migrants.

To test Hypothesis 1, model 2 interacts the employment growth variables with the contextual distance between the home and host countries. The results in models 2A and 2B show that the interaction effects are positive and significant (respectively β_{DM}= 0.215, $p < 0.001$ and β_{FM}= 0.038, $p < 0.001$), implying that the substitution effect is significantly weaker when the contextual distance between the MNE's home country and the source country of foreign employees is larger. These results confirm Hypothesis 1. Models 3A and 3B examine the moderating influence of the wage differential between the focal foreign country and the home country. The interaction effects are negative and significant (respectively β_{DM}= − 0.122, $p < 0.001$ and β_{FM}= − 0.030, $p < 0.001$), which implies that substitution between domestic and foreign employment growth is stronger in lower-wage countries, in support of Hypothesis 2. Models 4A and 5A show empirical results for the influence of firms' R&D intensity as an indicator of skill-intensive operations and employment. The interaction effect of R&D intensity with domestic employment growth is negative and significant (β_{DM}= − 0.024, $p <$ 0.001), while the interaction with foreign employment growth is negative but only marginally significant (β_{FM}= − 0.003, p = 0.058), providing qualified support for Hypothesis 3 that the substitution effect is significantly greater for firms that have knowledge-intensive operations both at home and abroad.

Finally, models 5A and 5B include all moderators simultaneously. We find comparable support for the hypotheses. The insignificant main effects of domestic employment growth and foreign employment growth in models 5A and 5B, respectively, suggest that for firms for which the moderators have zero values, there is no significant substitution effect. This applies to firms that are not R&D-intensive, operating in countries with close to average contextual distance and with no wage differential between the host and home country.

We examined the role of the moderators further by calculating the elasticity regarding the relationship between foreign and domestic employment growth for various levels of each moderator (keeping the level of the other moderators at the mean). Table 4 shows the changing elasticities as a function of different levels of contextual distance. The elasticity of foreign employment growth due to

Table 4 Elasticities of domestic (foreign) employment growth with respect to foreign (domestic) employment growth for different levels of the moderators

	Min	Mean − SD	Mean	Mean + SD	Max
Foreign employment growth as a function of domestic employment growth					
Contextual distance					
Elasticity	− 0.987	− 0.802	− 0.394	0.014	0.950
(*p* value)	(0.000)	(0.000)	(0.000)	(0.894)	(0.000)
Wage differential					
Elasticity	0.462	− 0.109	− 0.394	− 0.679	− 1.133
(*p* value)	(0.003)	(0.212)	(0.000)	(0.000)	(0.000)
R&D intensity					
Elasticity	− 0.386	− 0.386	− 0.393	− 0.431	− 0.613
(*p* value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Domestic employment growth as a function of foreign employment growth					
Contextual distance					
Elasticity	− 0.218	− 0.174	− 0.079	0.016	0.236
(*p* value)	(0.000)	(0.000)	(0.000)	(0.542)	(0.000)
Wage differential					
Elasticity	0.120	− 0.013	− 0.079	− 0.145	− 0.251
(*p* value)	(0.003)	(0.560)	(0.000)	(0.000)	(0.000)
R&D intensity					
Elasticity	− 0.078	− 0.078	− 0.079	− 0.085	− 0.116
(*p* value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

For R&D intensity the minimum is zero reached at mean-SD

changes in domestic employment growth varies between − 0.99 ($p < 0.001$) for the sample minimum of contextual distance to a significant positive effect of 0.95 ($p < 0.001$), if contextual distance is at its maximum. Similarly, the elasticity of domestic employment growth with respect to foreign employment growth ranges between − 0.22 ($p < 0.001$) to a significant and positive 0.24 ($p < 0.001$). Hence, for the highest levels of contextual distance the substitutive relationship between foreign and domestic employment growth turns into a complementary relationship. Similar observations can be made for the wage differential, with elasticities ranging between − 1.13 ($p < 0.001$) and 0.46 ($p = 0.003$) for effects on foreign employment, and between − 0.25 ($p < 0.001$) and 0.12 ($p = 0.003$) for effects on domestic employment. Foreign and domestic employment elasticities remain negative and significant ($p < 0.001$) for different levels of R&D intensity, with elasticities varying between − 0.39 and − 0.61 (foreign employment) and − 0.08 and − 0.12 (domestic employment). Overall, these results exemplify the importance of the theoretically proposed moderators.

Supplementary Analysis

We conducted a number of robustness tests to investigate the sensitivity of results to alternative specifications, results of which are relegated to an online appendix. Results were highly similar if we estimated models with country fixed effects, if we left out China and the U.S. from the analysis, if industries with the highest propensity to patent (pharmaceuticals and ICT) were removed from the analysis, if we augmented models with a variable measuring prior firm performance (firm-level return on assets in $t - 1$), and if we rely on contextual distance measures that exclude language distance or that use the Mahalanobis distance for aggregation (Beugelsdijk, Ambos, & Nell, 2018). We also examined if a recent migration policy change in the Netherlands has had consequences for firms' employment behavior and the relationship between domestic and foreign employment growth. In June 2013, the Dutch government issued the Modern Migration Policy Act to achieve a quicker, simpler, and for an employer less costly admission of skilled migrants. The time required to process an application for a residence permit and work permit was reduced by collaboration among various agencies and placing greater responsibility on the migrant's sponsor employer. We examined the consequences of this regulatory change by estimating interaction effects of the focal variables with a post-policy change dummy taking the value one from 2014 onwards. We observed a predominant trend toward stronger substitution between domestic and foreign employment growth, which is likely due to the fact that the easing of immigration focuses on highly skilled workers.

CONCLUSION AND DISCUSSION

Despite the attention given in the literature to MNEs and their employment of foreign talent, prior studies have not explored the interrelationship between the two channels of employing foreign talent: at home by employing migrants, and abroad by employing talent locally. We investigate the relationship between these two modes of employing foreign talent by conceptualizing it, in a knowledge-based perspective, as depending on three mechanisms: contextual knowledge complementarity, activity substitution and human capital substitution, with the net effect depending on differences between home and host countries and the nature of the MNE's operations. Using panel data on 1940 MNEs based in the Netherlands employing non-EU nationals (2008–2016) and estimating a system of simultaneous equations, we find that the relationship between foreign and domestic employment growth of foreign employees is predominantly substitutive in nature, but can turn complementary under specific conditions. Substitution effects are greater when there is a larger wage cost differential between home and host countries (activity substitution) and when MNEs are employing workers for high-skilled and R&D-intensive operations (human capital substitution). With activity substitution, a cost reduction motivation for foreign expansion leads MNEs to transfer production related knowledge abroad in order to substitute high-cost domestic operations by low-cost foreign activities. With human capital substitution, each highly skilled and internationally mobile foreign worker is matched to the location where the worker's knowledge and skills can be most productively put to use. In contrast, a complementary relationship occurs when source countries of foreign workers exhibit a high contextual distance from the MNE's home country, leading to greater benefits of knowledge diversity and alignment in contextual knowledge at home and abroad to support employment expansion.

Our study contributes to the knowledge-based view of the MNE (Almeida et al., 2002; Kogut &

Zander, 1993) by offering an integrated perspective on how MNEs coordinate employment decisions under conditions of knowledge diversity, scarce highly-skilled human capital, and opportunities to reduce labor costs. We show that in order to understand interrelated employment decisions, an integrated approach is required that allows for substantive heterogeneity in relationships due to country-specific traits and the nature and human capital needs of MNE operations. Hence, while the MNE's capacity to augment, transfer, exploit and recombine knowledge of its employees is an important source of sustainable competitive advantage (Narula et al., 2019), it requires carefully coordinated and country-specific effort.

Our findings at the firm level contrast with findings in prior studies of the relationship between migration and FDI at macro level (Foad, 2012; Javorcik et al., 2011) as those studies mainly found a complementary relationship. While these studies examine the effect of migration on FDI and the reverse effect of FDI on migration separately and at the macro level, we investigate the simultaneous relationship between them at the firm and country level. Our results suggest that to uncover the relationship between FDI and immigration, analysis has to go beyond the country level and focus on firm-level global employment decisions, while taking into account sources of firm- and country-level heterogeneity. Our study further indicates that MNEs, having the option to hire talent abroad (Harrison & McMillan, 2011; Kovak et al., 2021; Lewin et al., 2009), can choose which mode of employing foreign talent is most beneficial, taking into account the required skill levels and motivations for foreign affiliate employment expansion and the challenges in expanding abroad due to contextual distance with the home country. In this respect, our results are in line with the notion that MNEs will locate activities and workers at places where they can maximize their knowledge sourcing and integration potential taking into account relative (labor) costs in different locations (Harrison & McMillan, 2011; Lewin et al., 2009).

Our study also provides new insights into the literatures on global talent management and cross-border mobility of workers (Al Ariss et al., 2014; Breschi & Lissoni, 2009; Hajro et al., 2021; Stahl et al., 2012), by presenting evidence consistent with the notion that MNEs do optimize the allocation of global talent across global operations, if they recruit employees for high-skilled operations such as R&D. Labor markets for high-skilled employees are characterized by scarcity and high search costs and require a global recruitment approach by MNEs. High-skilled employees can be employed in other locations than their home country as they face few constraints to international mobility and have received universal training that prepares them for jobs in different work environments. We do however note that we find relatively smaller effects for this human capital substitution mechanism, presumably because not all firms have the capacity to globally coordinate individual employment decisions at home and abroad. Our findings on the role of contextual distance inform work on the importance of such distance in foreign investment decisions (Belderbos et al., 2021) and studies on the benefits of cultural diversity (Laursen et al., 2020). We confirm the notion that MNEs face higher costs and complexity of conducting operations in and in exchange with countries exhibiting greater contextual distance. At the same time, our results are consistent with the premise that cultural diversity may stimulate creativity and entrepreneurial decision-making (Boone et al., 2019) by facilitating foreign expansion.

Several managerial implications can be derived from our study – although we note the caveat that our analysis did not investigate the performance implications of MNEs' global employment decisions as such. Our study suggests that managers of MNEs coordinate domestic and foreign employment decisions such that foreign talent gets employed in those locations where there is the greatest need and where employment conditions are the best match. This will allow MNEs to improve the efficiency of their international operations and to realize a competitive advantage over domestic firms that only have access to a domestic employment channel. Not all MNEs are however equally well positioned to coordinate domestic and foreign employment expansions effectively. This depends on the nature of the MNEs' operations and associated skill levels of employees, differences in labor costs across home and host locations and related motivations for foreign employment expansion, and the contextual distance between the MNEs' home country and the locations where they conduct activities abroad. Hence, this requires MNE managers to carefully consider (international) human resource management and employment expansion decisions paying due attention to country-specificity and the skill intensity of operations.

In many countries, public policies and related social attitudes towards migrants and migration have become less welcoming since the 2010s (Barnard et al., 2019). Our findings suggest that policies that restrict immigration may have a negative impact on the competitiveness of home country MNEs because they will limit their ability to engage in value-enhancing labor arbitrage by coordinating domestic and foreign employment growth. Such policies are expected to have the most adverse consequences when there is contextual knowledge complementarity, in comparison with activity and human capital substitution, since restrictions under complementarity are likely to reduce employment growth of MNEs both at home and abroad.

On the host-country side, our findings indicate that foreign affiliate employment is more sensitive to the global coordination mechanisms than domestic employment of migrants. Hence, affiliate employment of MNEs might be more vulnerable in times of turmoil and changes in labor cost developments, in particular in low-wage countries where the motivation for affiliate expansion is cost reduction. In MNEs' affiliates with skill- and R&D-intensive operations, global talent management and coordination of hiring are likely to be associated with intra-firm international mobility of employees later in their career, such that skilled migrant employees may later be relocated to the affiliate bringing headquarter experience and firm-specific knowledge to local operations (Choudhury, 2017). In this regard, global talent management by MNEs may ultimately enhance local knowledge spillovers from MNEs to host countries.

We acknowledge a number of limitations of our research. First, we lack information on the skill level of firms' employees in foreign subsidiaries. Hence, we are unable to build and estimate models of employing high-skilled foreign employees both at home and abroad, which would be a more direct test of the skill-based hypothesis. Similarly, we have no information on the motivation of foreign employment expansions and we rely on differences in wage costs as a proxy for a factor-seeking and cost-reduction motivation for FDI. Another limitation of our research is that we cannot fully distinguish between the employment of new migrant workers from a country and the transfer of existing workers from foreign subsidiaries to the MNE's home country, or vice versa. In terms of internal mobility, we could only remove returning migrants (including Dutch expatriates) from the domestic employment growth measure. Such intra-firm mobility will provide MNEs with the most pronounced flexibility (Choudhury, 2017), but the theoretical mechanisms underlying such mobility are not very different from those of external hiring and employment growth. In general, we were unable to take into account information on expatriate workers and their often important role in domestic and foreign operations of MNEs (e.g., Belderbos & Heijltjes, 2005; Harzing et al., 2016). Our firm-level data also did not allow us to look inside the firm to examine heterogeneous organizational approaches to talent and diversity management (Harrison, Harrison, & Shaffer, 2019) and efforts to maintain talent portfolios (Morris et al., 2016) or the specific mandates given to the foreign affiliate. We suggest that case studies of management practice in MNEs would be a fruitful avenue for complementary future research.

Our analysis focused on the relationship between domestic and foreign employment growth of employees originating from a given foreign country. Migrants from a focal foreign country may also be employed in foreign subsidiaries in other countries, but we lack information on such lateral migration. Similarly, we did not simultaneously model the employment growth of native employees in the home country. Building and estimating such more complex models may easily result in loss of tractability, but is a worthwhile challenge for future research. Fourth, our analysis focused on MNEs from a small and highly internationalized economy, known for its experienced multinational firms. It is therefore important that future research examines whether results can be generalized to MNEs based in other countries.

ACKNOWLEDGEMENTS

The authors are grateful for constructive comments received from three anonymous reviewers, the editors Anu Phene, Stacey Fitzsimmons, Dana Minbaeva, and Sjoerd Beugelsdijk, participants at the paper development workshop for the JIBS special issue on global mobility, and participants at the AIB 2021 conference, the GEOINNO 2020 conference, the DRUID 2020 conference, the 2021 Migration and Organizations Conference and the 4th workshop on Migration, Globalization and the Knowledge Economy. The authors wish to thank Gerard Pfann, Keld Laursen, Wendy Smits and Sabien Dobbelaere for their valuable comments on earlier versions of the paper, and Statistics Netherlands (in particular the KIO team) for

providing us access to the data and their support with data processing.

NOTES

[1]See https://www.eetimes.com/asml-starts-global-recruitment-drive-for-500-engineers and ASML, Annual Report 2021, p.70 (https://www.asml.com/en/investors/annual-report/2021).

[2]See Philips Annual Report 2021, p.57 (https://www.results.philips.com/publications/ar21#downloads).

[3]We calculated total factor productivity by estimating the ('Solow') residual obtained by regressing firm consolidated value-added on consolidated employment and capital.

[4]We report on the Heckman first-stage model in the online appendix. The exclusion restrictions are significant and the model has an appropriate explanatory power.

[5]While the spatial econometrics literature typically takes geographic distance as weights of spatial lags (Blonigen et al., 2007), given our research questions and theoretical framework, contextual distance weights are more appropriate. Testing for remaining spatial correlation among the errors using the Moran's test suggested no spatial correlation.

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Accepted by Anupama Phene, Guest Editor, 1 June 2023. This article has been with the authors for three revisions.