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MNC subsidiary closures: What is the value of employees' human capital in new jobs?

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Abstract
We investigate the consequences of MNC subsidiary closures for employees who lose their jobs. In particular, we examine the extent to which the human capital that these employees acquired while employed by the MNC influences the wages they receive in their new jobs. We propose an employee displacement model for foreign MNC subsidiaries that integrates insights from the labor economics and international business literatures. We argue that a new employer will pay higher wages when signals indicate that potential employees have valuable, foreign human capital (e.g., the closed subsidiary was highly productive by host-country standards), and lower wages when signals indicate that potential employees have highly MNC-specific human capital (e.g., the employee had a long tenure in the closed subsidiary). We provide empirical evidence based on a sample of 110,133 displaced employees of closed MNC subsidiaries in Portugal. Our data set spans the period from 2005 to 2009. Showing that MNCs create a valuable pool of human capital for host-country firms when they close subsidiaries, our findings have important implications for research and practice.
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INTRODUCTION

Knowledge flows between the subsidiaries of multinational companies (MNCs) and their host countries have been a central topic in international business research (see Meyer & Sinani, 2009, for a review). Many host-country governments offer substantial incentives for foreign direct investments (FDI) with the aim of supporting knowledge flows that will enhance the productivity of domestic firms. However, the outcomes of such incentives are often disappointing because MNCs work to counteract such knowledge flows or because domestic firms cannot absorb the transferred knowledge (Alcacer & Chung, 2007; Feinberg & Majumdar, 2001; Zhao, 2006).

One element that has largely been neglected in the discussion to date is knowledge flows that originate from closed MNC subsidiaries. Employees of such subsidiaries have acquired knowledge, skills, abilities, and other characteristics, which are often referred to as "human capital" (Ployhart & Moliterno, 2011), during their tenures. This human capital becomes available to host-country firms when the subsidiary closes. We generate novel insights by studying the value that employers assign to the "foreign" human capital held by employees of closed MNC subsidiaries. More precisely, we use

differences in human capital to explain differences in the wages of former employees of closed foreign MNC subsidiaries who take new jobs and the wages of former employees of closed domestic firms.

We predict that a new employer will set wages based on signals predicting the future productivity of the employee (Spence, 1973). We argue that wages will be higher when signals indicate that the human capital acquired in the foreign MNC subsidiary is valuable and lower when signals indicate that the human capital is MNC specific. The latter implies that the hiring firm cannot expect to benefit from hiring the employee, as her[1] human capital is closely tied to the firm in which it was developed (Dokko, Wilk, & Rothbard, 2009; Huckman & Pisano, 2006).

We base these theoretical predictions on a framework that integrates international business research with labor economics. This interdisciplinary approach has the major advantage that we can benefit from insights from labor economics because the consequences of firm closures on employees have been intensively studied in this field. Then again, we are not aware of any study in labor economics that theorizes on the particular effects of closures of foreign MNC subsidiaries which makes the topic particularly salient for research in international business. Hence our integrative, theoretical framework of both research streams provides an opportunity to add value beyond a single discipline.

Our theoretical framework builds on the displacement model of labor economics which defines the job seekers in focus in this article as "displaced" because they were not dismissed as a result of individual performance deficits or misconduct (Kletzer, 1998). This labor economics model postulates that employees build human capital throughout their careers, and that human capital differs in its degree of specificity for use outside of the firm in which it is acquired. A displaced employee may face a steep decline in future salary if her human capital is highly specific to the closed firm. In such situations, a closure essentially depreciates her individual human capital. Empirically, displacement has been found to have a persistent, negative effect on future earnings (Couch & Placzek, 2010). However, these earnings losses can be reduced if the human capital of a displaced employee can be transferred to a new employer.

We integrate this displacement model with the international business literature by connecting it to the value and specificity of the human capital employees develop while working for an MNC. On the one hand, employees who work for an MNC subsidiary are exposed to knowledge that is not otherwise available in the host country, and such employees often have richer opportunities for developing key skills, such as the ability to lead and coordinate international teams (Kogut & Zander, 1993). We argue that a new employer will pay a higher salary when signals highlight the value of such human capital acquired from the closed MNC subsidiary. On the other hand, human capital can be highly specific to the firm in which it was acquired, which implies that it either cannot be fully transferred to a new employer or that it will be less beneficial (Dokko et al., 2009; Huckman & Pisano, 2006). We predict that new employers will set lower wages in the presence of signals indicating that the displaced employee's human capital is MNC specific, as such human capital cannot be transferred to the new firm. The integrated theoretical model that we develop can be described as an employee displacement model for foreign MNC subsidiaries.

This integrated theoretical model from labor economics and international business enables predictions which go beyond existing research along three dimensions. First, we focus on the employees affected by the closure of an MNC subsidiary rather than on the reasons for the MNC subsidiary's closure (see Berry, 2013, for a review of research on the latter). Second, while most research examines the effects of MNC entries on the host countries (de Backer & Sleuwaegen, 2003), we focus on the effect of MNC departures. Finally, we investigate a unique situation, as foreign MNCs voluntarily release employees, who are carriers of their human capital, when they close subsidiaries. This voluntary release of human capital has different implications than those typically described in the personnel mobility literature, which generally acknowledges that employees can transfer strategic assets such as tacit knowledge (Almeida & Kogut, 1999; Song, Almeida, & Wu, 2003), skills (Wang, He, & Mahoney, 2009), and social capital embedded in relationships (Corredoira & Rosenkopf, 2010; Dokko & Rosenkopf, 2010).

Within our theoretical model, we suggest that positive signals and, in turn, higher wages in the new firm originate from the previous job function of the displaced employee (e.g., management) and from the productivity of the closed subsidiary. The latter is especially interesting because foreign MNC subsidiaries are evaluated relative to other subsidiaries and to other host countries (Chakrabarti, Vidal, & Mitchell, 2011). Closed MNC subsidiaries may still be viewed as highly productive within a host-country comparison group. We predict that this

perception sends positive signals to future employers about the value of a displaced employee's human capital.

We predict that negative signals and, as a result, comparatively lower wages will originate from the tenure of the displaced employee in the closed subsidiary. Longer tenures are assumed to increase the MNC specificity of the acquired human capital. Finally, we predict that the MNC's level of equity control in the closed subsidiary, as well as the presence of expatriates, will show an inverse u-shaped relation to the salary of a displaced employee in a new job. We argue that a certain degree of foreign equity and management by expatriates in the closed subsidiary increases the probability that the displaced employee was exposed to MNC practices, techniques, and knowledge that could constitute positive signals for a new employer. However, the acquired human capital could be assumed to be highly MNC specific if the subsidiary was fully owned by the MNC or managed by expatriates. Hence we conclude that intermediate levels serve as optimal signals.

We test these hypotheses using a sample of 110,133 displaced employees in Portugal that covers the period from 2005 to 2009. Our analysis is based on dynamic fixed-effects regression models. Only the predicted effect of expatriates is not empirically supported. Our findings have important implications for research and practice.

On the academic side, our interdisciplinary approach has implications for research in international business and in labor economics. We provide fresh impulses for research on the performance effects of labor mobility among firms in general (Corredoira & Rosenkopf, 2010; Dokko & Rosenkopf, 2010), and between MNCs and their host countries in particular (Almeida & Kogut, 1999). More precisely, we find that the closure of a foreign MNC subsidiary creates a pool of human capital in the host country that is valued by potential new employers, as evidenced by the comparatively higher wages for the displaced employees of foreign MNC subsidiaries. However, when negotiating wages, hiring firms balance the value of a displaced employee's human capital with that capital's MNC specificity. These considerations differ when displacement occurs in domestic firms. Furthermore, we show that the closure of a foreign MNC subsidiary is not necessarily a completely negative event for the host country, as domestic firms gain access to foreign human capital. This finding extends the work reviewed by Berry (2013). Moreover, with regard to the international business research focused on competition between MNCs and host country firms in factor markets, we find that the crowding-out of host-country labor markets that occurs when an MNC enters those markets (de Backer & Sleuwaegen, 2003) is not simply reversed if the MNC leaves. Instead, we find that some foreign human capital is specific to the MNC and is not viewed as valuable by host-country firms.

In relation to research on labor economics, we provide a theoretical link between displacement and the wage effects of foreign MNC subsidiaries. Both topics have previously been studied largely in isolation. Job displacement studies conclude that displaced employees generally suffer considerable earnings losses (Couch & Placzek, 2010; Kletzer, 1998). Studies focused on the effect of foreign ownership on the wages of employees identify a "foreign wage premium". In other words, MNC subsidiaries pay higher wages, on average, than domestic firms (Aitken, Harrison, & Lipsey, 1996; Hijzen, Martins, Schank, & Upward, 2013; Malchow-Møller, Markusen, & Schjerning, 2013). We connect these two research streams by showing that employment in an MNC subsidiary not only implies a "foreign wage premium" but also provides specific signals that influence the salary offered by new employers after displacement. Our findings indicate that foreign MNC subsidiaries are distinctive based on the particularly valuable human capital that they provide and on the specificity of that human capital. Therefore studies that ignore the unique situation of displaced employees of foreign MNCs are likely to suffer from biases.

In terms of implications for practice, the closures of foreign subsidiaries and the resulting job losses have provoked outrage and public protests in many host countries in recent years.[2] Hence, theoretical predictions and empirical tests of the consequences of such job losses are important for a broad audience. For example, our findings provide job seekers with a more comprehensive basis from which to evaluate their career planning, especially in terms of working for an MNC subsidiary. MNC managers can optimize divesture policies by taking unintended effects from outflows of strategic assets into account; and policymakers can design appropriate support instruments for employees who lose their jobs as a result of MNC closures.

The remainder of this article is structured as follows. In the following section, we provide an in-depth review of the theory and develop our hypotheses. It is followed by the description of the empirical study used to test our hypotheses. Subsequently, we present and discuss the results. We finish with our

conclusions and suggested directions for future research.

THEORY

The international business literature has devoted a great deal of attention to MNCs' interactions with their host-country environments. One of the most interesting elements of such interactions is the competition for skilled workers, scientists, and engineers (Almeida & Kogut, 1999; de Backer & Sleuwaegen, 2003; Grossman, 1984). However, as such studies typically focus on the hiring of new employees in MNC subsidiaries, little is known about what happens to host-country employees when a foreign subsidiary closes.

Subsidiary closures are not uncommon (Berry, 2013; Mata & Freitas, 2012). They typically occur when MNCs reconfigure international assets in order to maximize performance. Such reconfigurations result in investments in some locations and divestment in others (Chakrabarti et al., 2011).

Our model is designed to explain the value of the human capital held by a former employee of a closed subsidiary in relation to her new job. We define "human capital" as all of the knowledge, skills, abilities, and other characteristics of an individual that can be valuable resources for an organization (Ployhart & Moliterno, 2011). The dependent variable in our theoretical model is the salary that an employee earns in her new job. Differences in wages can be explained by differences in human capital among employees. An employee with more human capital will be more productive for the hiring firm and should, therefore, be rewarded with a higher salary (Becker, 1962; Ranft & Lord, 2000; Weiss, 1995). However, new employers are unlikely to be able to accurately and comprehensively observe the human capital of job applicants. The information between job applicants and potential employers regarding an applicant's human capital is asymmetrically distributed. In addition, applicants with comparatively less human capital have incentives to hide this disadvantage (Stiglitz, 2002). Therefore a prospective employer can only set a salary for a new employee based on observable signals regarding her human capital. Such signals may, for example, include degrees or certifications (Spence, 1973). In this article, we focus on certain signals related to former employees of closed MNC subsidiaries and how those signals influence their wages in their new jobs.

When subsidiaries are closed, employees are not dismissed because of individual misbehavior or poor performance. Therefore, in line with Kletzer (1998), we define this group of employees as "displaced", that is, as "individuals with established work histories, involuntarily separated from their jobs by mass layoff or plant closure (rather than because of individual job performance), who have little chance of being recalled to jobs with their old employer" (Kletzer, 1998: 116). Displacement has been intensively studied in labor economics, and reviews of the extant literature undertaken by Couch and Placzek (2010), Fallick (1996), and Kletzer (1998) show that job displacement results in a loss of earnings, which appears to persist for an extended period of time.

This loss in earnings is typically explained by the way in which employees acquire human capital while working for a company. Human capital varies in terms of the extent to which it is specific to the firm in which it was acquired (Kletzer, 1998). Human capital that is general in nature can be applied in different contexts and organizations. General human capital can encompass knowledge, for example, the use of standard software tools or word processors, as well as general skills, such as the ability to coordinate and communicate within a team. In contrast, specific human capital only has value in the particular context or organization in which it was acquired, that is, it cannot be completely transferred to another organization. Examples of cases in which the performance of employees declines when they change to new firm contexts include stock-market analysts who switch employers (Groysberg, Lee, & Nanda, 2008) and freelance surgeons who operate in multiple hospitals (Huckman & Pisano, 2006). The firm specificity of human capital originates from employees' knowledge or skills that are only valuable when they are combined with the specific human, physical, or knowledge resources of a firm, such as knowledge of how to drill for oil in a unique geological area (Helfat, 1994; Huckman & Pisano, 2006). Logically, the value of an employee's human capital for another firm is limited to the general, transferable component of that capital. If the firm in which the specific human capital was accumulated closes, then the human capital of the employees depreciates because the strictly firm-specific components are not of value to potential employers.

Value vs Specificity in the Human Capital of Displaced Employees of MNC Subsidiaries

Employees who have developed human capital while working for a foreign MNC subsidiary have had access to a pool of valuable knowledge and practices that may not otherwise be readily available

in the host country. This follows the basic rationale that knowledge flows more easily within countries than across country boundaries (Audretsch & Feldman, 1996). The boundaries between knowledge pools in different countries persist because of linguistic, cultural, or institutional differences at the national level (Kogut, 1991). The geographical concentration of knowledge flows can also be traced to limitations in the willingness of knowledge carriers, for example, scientists or engineers, to move (Almeida & Kogut, 1999). MNCs have been found to be especially efficient in overcoming the barriers to international knowledge transfer. They can function as social communities with shared routines and understandings of knowledge across international subsidiaries (Kogut & Zander, 1993). Hence tacit elements of an MNC's knowledge stock can be transferred efficiently, and employees who are exposed to these intra-MNC knowledge flows can build a unique knowledge stock in the host country. Moreover, employees become part of the intra-MNC social community and develop skills in practice (Brown & Duguid, 1991). Examples of such skills include the ability to lead international teams encompassing various languages and cultures, or the ability to synchronize production planning or sales in geographically dispersed organizations. Hence the displaced employees of foreign MNC subsidiaries have had more opportunities to build human capital through knowledge and skill development than the displaced employees of domestic firms. Given this line of reasoning, a displaced employee's experience in a foreign MNC subsidiary should send more positive signals about that employee's human capital to potential employers relative to the signals associated with their domestic counterparts.

Employees cannot comprehensively transfer human capital from one firm to another for two primary reasons. First, the firm in which the human capital is initially developed controls unique complementary assets, for example, brands, mining rights, and patented technologies, that allow the employee to be productive (Helfat, 1994). If the hiring firm does not possess equivalent complementary assets, then her human capital will be of less value. Second, even in the presence of equivalent complementary assets, human capital may remain specific to the firm in which it was developed as a result of social mechanisms. Groysberg et al. (2008) find that the human capital of an individual is often embedded in the learning processes of an entire team or organization, such that the experience of an individual employee is embedded in the more complex social context of the organization. A team of colleagues may, for example, co-develop knowledge and skills to compensate for the weaknesses of a particular team member, or to leverage a team member's strengths (Huckman & Pisano, 2006). This social context cannot be transferred between firms.

Moreover, Dokko et al. (2009) point out that employees not only transfer knowledge and skills from one employer to another, but they also transfer norms and schemas about how work should be conducted. The latter have a negative effect on firm performance because they lead to rigidities in how employees operate in their new jobs (Groysberg et al., 2008). We argue that this effect is especially pronounced for displaced employees of foreign MNC subsidiaries because they are accustomed to operating in a dual context (Almeida & Phene, 2004). In MNC subsidiaries, practices and procedures must be compatible with both host-country and intra-MNC requirements. For example, Budd, Konings, and Slaughter (2005) show that wages in foreign subsidiaries are at least partially determined by conditions at headquarters, such as profitability and union involvement. This implies that the practices of foreign MNC subsidiaries cannot seamlessly be adapted to the host-country context because doing so would create frictions within the MNC. Along these lines, Mezias (2002) finds that intra-MNC management practices increase the probability of labor lawsuits in US subsidiaries.

In sum, we argue that signals highlighting the unique value of the human capital held by displaced MNC employees should lead to higher wages in their new jobs. At the same time, signals of the MNC specificity of human capital should lead to lower wages.

Signals Regarding the Productivity of the Closed MNC Subsidiary Relative to the Host-Country's Industry

While MNC subsidiaries are generally expected to transfer valuable resources to host countries (Kronborg & Thomsen, 2009), the closure of a subsidiary may send negative signals about the value of the human capital of displaced employees. The fact that performance deficits are the primary reason for the closure of international MNC subsidiaries (Berry, 2013) might suggest that the human capital a displaced employee can bring to a new firm is generally less valuable. However, comparisons of the performance of MNC subsidiaries are based on intra-MNC benchmarks and reference groups. They cannot be readily extended to comparisons with host-country

rivals. In other words, an MNC subsidiary may be highly successful when compared with host-country competitors and still be closed because the MNC decides to shift its activities to subsidiaries with even higher productivity.

MNC subsidiaries are heterogeneous in the roles that they perform for the MNC. Some subsidiaries have mandates to merely exploit existing MNC knowledge, for example, in production, while others have mandates to explore new products, processes, and markets (Cantwell & Mudambi, 2005). MNC subsidiaries compete with each other for these mandates (Birkinshaw & Hood, 1998). Therefore a decision to close a particular MNC subsidiary is not necessarily an indication of that subsidiary's performance; it merely implies that another subsidiary is taking over its mandate based on its superior capabilities.

A firm interested in hiring a displaced employee of a foreign MNC subsidiary will assign little relevance to intra-MNC comparisons of subsidiary performance. Instead, the firm will evaluate the human capital that the displaced employee can bring to the company relative to the host-country's standards. A new employer can therefore compare the productivity of the closed foreign MNC subsidiary to the host-country average to gain an impression of the value of the displaced employee's human capital. A highly productive foreign MNC subsidiary may have been closed for reasons related to intra-MNC criteria. The same logic cannot be applied to displaced employees of strictly domestic firms. We therefore propose:

Hypothesis 1: All else equal, displaced employees of foreign MNC subsidiaries receive higher wages in their new jobs if the productivity of the closed foreign MNC subsidiary was higher than the host-country, industry average.

Tenure at the Closed MNC Subsidiary

In general, human-capital theory assumes that longer tenures are positively related to the value of an individual's human capital. Consequently, tenure is used as a signal of an individual's potential productivity (Brown, 1989; Ng & Feldman, 2013; Sicherman & Galor, 1990). Individuals with long tenures tend to accumulate more human capital through formal education and work experience than individuals with short tenures. The former's human capital is a signal of the employee's knowledge and skills (Ng & Feldman, 2010; Sicherman & Galor, 1990). The attraction – selection – attrition model also suggests a positive link between tenure and performance. Firms lay off fewer productive employees earlier in their careers within the firm, implying that tenure reflects performance-based selection (Ng & Feldman, 2013; Schneider, 1987).

Tenure also indicates the extent to which an employee has been exposed to specialized firm-level knowledge and information (Gilson, Lim, Luciano, & Choi, 2013; Sturman, 2003). Individuals with longer tenures are more likely to be exposed to procedures and practices that are specific to the firm, and to obtain tacit and explicit firm-specific knowledge (Gilson et al., 2013; Nonaka, 1994). A longer tenure may also enhance an employee's person – firm fit, as well as the alignment between the goals of the employee and the firm (Ng & Feldman, 2010; Wagner, Ferris, Fandt, & Wayne, 1987).

However, tenure in foreign MNC subsidiaries differs from tenure in domestic firms. MNC subsidiaries are extensions of their home countries' culture and values (Brannen & Peterson, 2008). Hence the host-country employees of MNC subsidiaries are exposed to acculturation processes that are similar to those experienced by expatriates working abroad (Black, Mendenhall, & Oddou, 1991). As a result of this process, host-country employees of an MNC subsidiary acquire identities that are amalgams of their native cultures and the culture of the MNC's home country (Caprar, 2011). This can be the outcome of dedicated MNC management practices (Ailon & Kunda, 2009) or it can be triggered by incentives, such as increased opportunities for job promotions (Herrmann & Werbel, 2007). Therefore employees of MNC subsidiaries are more likely to have values and identities that are distinct from those of their domestic counterparts. Caprar (2011) provides some stylized evidence indicating that the influence of the MNC's home-country culture on subsidiary employees increases in line with tenure. Accordingly, we predict that tenure serves as a positive signal of the human capital for all displaced employees, but that the value of a long tenure at a closed MNC subsidiary is comparatively lower because new employers may fear cultural conflicts arising from the acculturation of the displaced employee at the closed MNC subsidiary. Displaced employees of domestic firms with similar tenures do not have this disadvantage. We hypothesize:

Hypothesis 2: All else equal, displaced employees of foreign MNC subsidiaries with longer tenures receive lower wages in their new jobs than their host-country counterparts.

Job Functions

The opportunities employees have to develop their own human capital depend on their functional roles within the organization. Different functions expose employees to different kinds of knowledge, and they trigger heterogeneous skill development (Bechky, 2003). This influences the value of the human capital in a new job after displacement from a foreign MNC subsidiary. Lecuona & Reitzig (2013) show that manual workers acquire knowledge and skills while operating machinery and equipment that can be taught quickly either through codified manuals or short training sessions. Manual processes can be broken down and described in step-by-step processes. In this regard, modern production techniques are different from traditional crafts, as manual workers do not necessarily need experience to know when to intervene in the production processes because such decisions can be based on measurements or automation (Balconi, 2002). Hence, displaced employees of foreign MNCs will not have advantages when applying for a new job based on human capital acquired in manual labor.

In comparison, managers are involved in a broad set of decision-making tasks, and they are forced to deal with employees, suppliers, customers, and government authorities. This implies that their knowledge is difficult to codify, and that they can develop leadership, coordination, and communication skills within the firm (Lecuona & Reitzig, 2013). This fact is especially relevant for managers of foreign MNC subsidiaries because an important part of their responsibilities is to generate consistency between host-country and intra-MNC practices and procedures in terms of technologies, accounting, and goal setting (Almeida & Phene, 2004). Hence they have opportunities to absorb foreign MNC knowledge and build skills regarding the use of that knowledge in the host country. Therefore a manager's human capital sends positive signals to potential employers about the value of the human capital developed within the MNC that is otherwise unavailable in the host country and about that manager's experience with regard to the application of the MNC's knowledge, resources, and techniques in the host country. Hence we conclude that displaced employees of foreign MNC subsidiaries receive higher wages in their new jobs if their job functions at the subsidiary included more managerial tasks. We therefore propose:

Hypothesis 3: All else equal, displaced employees of foreign MNC subsidiaries receive higher wages in their new jobs than their host-country counterparts if their previous job functions included managerial tasks.

Equity Control by the MNC

MNCs differ in terms of the level of control that their global headquarters exercise. For example, MNC subsidiaries can be organized as joint ventures or fully owned subsidiaries. Transaction cost theorists treat an MNC's share of equity in a subsidiary as an indicator of the level of control under the assumption that an MNC's share of equity in a subsidiary indicates its contribution (Blodgett, 1991). As the transfer of MNC resources and capabilities, such as brands, intellectual property, and practices, increases, the MNC will choose higher levels of equity in order to gain access to the economic returns (Oxley, 1997). Conversely, subsidiaries with low levels of foreign equity are more likely to draw from the resources and capabilities of host-country partners (Hennart, 2009).

This has two consequences for the signal that the share of foreign equity in the closed subsidiary sends regarding the value of the human capital of its displaced employees. On the one hand, a higher share of foreign equity signals that displaced employees were exposed to valuable MNC resources and capabilities. Hence, they had opportunities to acquire valuable MNC knowledge and to develop skills in the MNC environment. Displaced employees of a subsidiary in which the MNC had a low equity share may not have significantly different human capital than their counterparts from domestic firms. On the other hand, equity control, and the transfer of resources and capabilities from foreign MNCs, can signal that the human capital of displaced employees is highly MNC specific. Human capital that was developed in a fully owned foreign MNC subsidiary is likely to be based on intra-MNC practices and routines. Therefore whether displaced employees will be able to transfer this MNC specific human capital to a new employer may be questionable.

In sum, we predict an inverse u-shaped relationship between the share of foreign equity in a closed MNC subsidiary and the salary of that subsidiary's displaced employees in their new jobs. In other words, we conclude that a new employer will treat the presence of foreign equity in a closed subsidiary as a positive signal about the value of the human capital held by a displaced employee because it implies that the employee had more opportunities for knowledge and skill development than counterparts from domestic firms. However, for fully owned

foreign MNC subsidiaries, this positive effect is counterbalanced by signals of high MNC specificity. In such cases, a new employer may have doubts about whether the human capital of the displaced employee can be used outside the MNC's firm-specific context. Hence intermediate levels of foreign equity in a closed MNC subsidiary should send optimal signals. We predict:

Hypothesis 4: All else equal, the relationship between the share of foreign equity in a closed MNC subsidiary and the wages of displaced employees in their new jobs follows an inverse u-shaped curve.

MNC Expatriates

The ability to transfer knowledge between headquarters and subsidiaries is a key source of competitive advantage for MNCs (Chang, Gong, & Peng, 2012; Kogut & Zander, 1993). Knowledge transfers are facilitated by the organizational culture and social environment that the MNC creates across its subsidiaries (Andersson, Forsgren, & Holm, 2002). Expatriates – individuals who are transferred outside their native country to work in another country – assume an important role in the creation of close links between the headquarters and subsidiaries of MNCs (Cerdin, Diné, & Brewster, 2014). Although, on average, expatriates only represent 1–2% of the total number of employees of MNCs, they are viewed as strategic actors in international knowledge flows within MNCs (Hocking, Brown, & Harzing, 2004; Kamoche, 1997). MNCs often use expatriates to create an organizational culture, and to transfer knowledge between their headquarters and their subsidiaries (Fenwick, de Cieri, & Welch, 1999).

In this context, several studies use expatriates as a proxy of knowledge transfer (Colakoglu & Caligiuri, 2008; Gaur, Delios, & Singh, 2007). Along these lines, we argue that employees of MNC subsidiaries with more expatriates are more exposed to the knowledge and routines of the MNC. This exposure has conflicting effects. On the one hand, it increases the degree of knowledge uniqueness, which makes the knowledge of a displaced employee of a foreign MNC particularly valuable. On the other hand, it affects the MNC specificity of a displaced employee's human capital, making it less useful for new employers. In sum, we expect an inverse u-shaped relationship between the presence of expatriates in a closed MNC subsidiary and the future earnings of a displaced employee. Within a comparison group of displaced employees, an employee who did not receive knowledge and develop skills while working with expatriates will be unable to distinguish herself, while one who has exclusively worked with expatriates will have highly specific human capital from the MNC environment. Hence the presence of expatriates in the closed MNC subsidiary sends a positive signal about the value of human capital of a displaced employee for future employers up to a certain point, after which the number of expatriates in the closed subsidiary raises doubts about the MNC specificity of the applicant's human capital. We hypothesize:

Hypothesis 5: All else equal, the relationship between the number of expatriates in a closed MNC subsidiary and the wages of displaced employees in their new jobs follows an inverse u-shaped curve.

EMPIRICAL STUDY

Data and Sample

We use the Quadros de Pessoal (QP) micro data to test the hypotheses. The QP is a Portuguese, longitudinal-matched, employer-employee data set covering the period from 2002 to 2009. Portugal is an especially fitting host country in relation to our research question because it has been a major recipient of FDI following its accession to the European Union (EU) and to the single European currency, the euro (OECD, 2013). This is mostly explained by the country's comparatively low labor costs, economic reforms, and access to the large EU markets. However, Portugal has found itself in competition for FDI with Eastern European countries that have joined the EU. While Portugal has attracted investments from major foreign MNCs, including Volkswagen (Germany) and Renault (France), it has also experienced painful retreats of foreign MNCs. For example, the country's biggest exporting firm – a subsidiary of the German semiconductor manufacturer Qimonda – closed, and General Motors moved production from Portugal to Spain. Hence, Portugal provides an ideal setting for studies of displacement following the closure of foreign MNC subsidiaries.

As the recent financial crisis required severe macroeconomic adjustments in Portugal, we use the observation period from 2005 to 2009. In this focal period, Portugal serves as an empirical setting that may be similar to many other medium technology-intensive countries that compete for FDI.

The QP data are gathered annually by the Portuguese Ministry of Labor, and they include data from all private firms with at least one wage earner. As

participation is mandated by law and as the provision of misinformation is punishable, the integrity of the data is high. Biases originating from selection or narrow industry coverage are unlikely, and the data do not cover public administration. The survey collects detailed information on each employee as well as basic information about the firm, such as size, ownership, sales turnover, industry (ISIC code), and location.

Each annual survey covers 300,000 firms and nearly 3,000,000 workers, who can be tracked over time through unique identification numbers. Our sample comprises only those employees who moved from a closing firm to another firm in Portugal the subsequent year. In line with Mata and Portugal (2002), we classify a firm as a closing firm when it does not report information for 3 consecutive years (this time lag allows for differentiation between closed firms and firms with missing values).[3] Firms can also divest subsidiaries through alternative methods, for example, sales or initial public offerings (Berry, 2013). For the purpose of our study, it is crucial to capture employee displacement following subsidiary closure. Employees may also experience changes in wages if their company is sold. We avoid this potential source of bias by including only employees from closed firms in our sample. Our unit of observation is the individual displaced employee. We apply a model focused on pre-displacement and post-displacement wages that explores variance among employees' wages. Our sample includes 110,133 displaced employees from 38,484 firms. During the observation period, 676 foreign MNCs closed subsidiaries, resulting in the displacement of 8139 employees.

Variables

Dependent Variable

Our dependent variable is the hourly wage of the displaced employee in the new firm (in logs) (Ranft & Lord, 2000). We deflate this variable using the yearly consumer price index. The fact that we only observe employees who find a job after the displacement might imply a selection bias, as other displaced employees may remain unemployed, retire, or stop searching for employment. Nevertheless, our data set covers only employed persons and cannot be merged with alternative data sources, such as unemployment records, due to data-protection laws. This has two consequences for our empirical analysis. First, our findings are limited to displaced employees who find a new job within 1 year of their subsidiary's closure, which should be borne in mind when interpreting the empirical results. However, we also conduct a consistency check with a 2-year time horizon, the results of which support the results of the main model. Second, the estimations would only suffer from a selection bias if displaced employees of foreign MNC subsidiaries had a significantly different probability of finding a new job than their domestic counterparts, which is not the case. The correlation between foreign ownership of a former employer and the probability of finding a new job is only 0.07 in QP.

Independent Variables

Hypothesis 1 predicts that the salary of a displaced MNC employee in a new firm is dependent on the closing firm's level of productivity. Productivity is measured as labor productivity, that is, sales per employee. To test Hypothesis 2, we measure tenure as the number of years that the employee worked in the closing firm. In Hypothesis 3, we predict that the extent to which the employee held management functions in the closing firm impacts the salary in the hiring firm. Job functions can be distinguished based on the tasks typically handled by employees. Such functions can be identified in employment statistics (Lecuona & Reitzig, 2013). We include two binary variables for job functions with managerial tasks based on official labor statistics (Baptista, Lima, & Preto, 2012): professionals and managers. The group of professionals contains employees with tasks described as complex, delicate, and non-repetitive, with high technical value as well as supervision responsibilities. The group of managers includes top and intermediate managers who set company strategies and adapt those strategies for implementation. Consequently, the control group encompasses those employees with manual tasks for which they do not need specific qualifications. We measure the level of control that global headquarters exercises on the MNC subsidiary using the percentage of foreign capital. As Hypothesis 4 predicts that the relationship between the employee's salary in the new firm and the percentage of foreign capital in the closing firm has an inverse u-shape, the squared term is also included.

We test Hypothesis 5 by measuring the number of managers that were expatriates in the closed MNC subsidiary. We define expatriates as foreign individuals in MNC subsidiaries who have not previously worked in Portugal, and who undertake professional, supervision, and/or managerial tasks. For each displaced employee, we count the number of expatriates that she has worked with since joining the

subsidiary. As we predict an inverse u-shaped relationship between this variable and the dependent variable, the squared term is also included. The number of managers who are expatriates in the closing MNC subsidiary is only an indirect measure of exposure to foreign knowledge.

Firms may also possess foreign knowledge derived from their exporting experience, which our foreign-capital investment variable cannot capture (Cassiman & Golovko, 2011). A control variable for export activities is not available. However, this factor induces a downward bias in our estimations because the displaced employees of export-intensive, domestically owned firms are included in the control group. Significant findings should therefore be assumed to be conservative estimates.

Control Variables

We control for several other employee and firm characteristics that have been identified in the literature as influencing wage levels.

First, we identify a number of control variables at the individual level. Education influences the wage level of an employee. We use three binary variables to categorize employees according to their educational level: basic, secondary, and college. We also include a binary variable to control for gender, as female employees have been found to earn lower wages than their male colleagues (Frank, 1978). We also use employee age to control for general experience (Psacharopoulos, 1985). Furthermore, we control for the nationality of the employee by including a binary variable that identifies foreign individuals.

Second, the displaced employees of an MNC subsidiary may have possessed superior human capital when they joined the MNC, for example, because working for an MNC offers opportunities for travel (Newburry, Gardberg, & Belkin, 2006). Hence, there may be a selection effect when employees enter an MNC, which would introduce an omitted-variable bias to our results. We capture this potential effect by including the average hourly wage of each displaced employee in the year that they entered the MNC subsidiary. The entry wage allows us to control for any unobserved heterogeneity among displaced employees at the time of their entry into the MNC. We also run a consistency check in which we include the average yearly increase in wages up to the year before displacement. The latter variable allows us to control for any other unobserved differences among employees while working for the firm that subsequently closed. Hence we control for any unobserved heterogeneity among subsidiary employees at the time of entry into the MNC and while working for the closed firm as long as that heterogeneity is economically reimbursed through wages. The main estimation results remain unaffected. We return to this variable when we discuss the estimation method.

Third, at the firm level, we control for firm size, the productivity of the hiring firm, knowledge intensity, industry, and the share of foreign capital in the hiring firm. We measure firm size using the natural logarithm of the number of employees in the firm. Larger firms may have more resources to hire new employees (Gibson & Stillman, 2009). We also expect more productive firms to be willing and able to pay higher wages. We measure productivity as sales per employee. MNC subsidiaries have also been found to vary in terms of knowledge intensity (Cantwell & Mudambi, 2005). We use the share of employees with college education to capture this effect. In addition, we include 12 binary variables to differentiate among industries because opportunities to absorb external knowledge and the mechanisms for doing so have been found to be highly industry specific (Koehler, Sofka, & Grimpe, 2012). Industries are defined using one-letter ISIC codes. We conduct a sensitivity check that includes knowledge intensity at the industry level, that is, the share of college-educated employees as a share of the industry total. However, the results are not significantly different from the main estimation results. Our reference group is the primary sector (ISIC code A-C). We include a binary variable that identifies individuals who did not switch industries (at the one-letter ISIC code level), as such a move may lead to a devaluation of specific human capital (Kletzer, 1998). The share of foreign capital of the hiring firm is included because the presence of foreign capital may affect the firm's wage policy and, therefore, influence the dependent variable (Budd et al., 2005).

Fourth, we control for differences in labor-market efficiencies. Labor markets are geographically confined. We include a binary variable that identifies firms located in Portugal's two large metropolitan areas (Lisbon and Oporto), which are regions with intense economic activity relative to the rest of the country. Together they contain around 70% of the salaried employees covered by QP.

In inefficient labor markets, new firms may not need to pay higher wages for the value that they recognize in displaced employees because of a surplus in labor supply. This situation cannot be ruled out because many job seekers enter the job market at the same time following a closure. However, this

situation would add a downward bias to our estimation results, such that significant differences in wages would become increasingly unlikely. Hence we would underestimate the effects rather than overestimate them if labor markets are not fully efficient.

Finally, year binary variables are included for the years 2006, 2007, 2008, and 2009 in order to control for the business cycle (2005 is the reference year).

Estimation Method

In order to test our hypotheses, we use two ordinary least-squares regression models, one for displaced employees from closed MNC subsidiaries and one for employees of closed domestic firms. The estimation equations are the following:

$$W_{t+1} = \beta_1^{\mathrm{MNC}} X_t + \beta_2^{\mathrm{MNC}} C_t + \beta_3^{\mathrm{MNC}} W_k + \beta_4^{\mathrm{MNC}} dW_{t-k} + e_{\mathrm{MNC}} \quad (1)$$

if displaced from an MNC, and

$$W_{t+1} = \beta_1^{\mathrm{DOM}} X_t + \beta_2^{\mathrm{DOM}} C_t + \beta_3^{\mathrm{DOM}} W_k + \beta_4^{\mathrm{DOM}} dW_{t-k} + e_{\mathrm{DOM}} \quad (2)$$

if displaced from a domestic firm.

The sets of variables in both equations are identical, although Eq. (1) is estimated for the subsample of displaced employees from foreign MNC subsidiaries, while Eq. (2) is estimated for the subsample of displaced employees from domestic firms. We define an MNC subsidiary as a firm with foreign capital. Displacement occurs at time *t*. The dependent variable is the wage in the new job in the following year (W_{t+1}). X_t signifies the independent variables related to Hypotheses 1, 2, and 3, that is, tenure, job function, and the productivity of the closed firm, respectively. In addition, we include the control variables (C_t).

The estimation of empirical models with wage as the dependent variable has two primary challenges. First, individuals have many unobserved characteristics (e.g., motivation) that may bias the estimation results. Second, wages are highly time dependent (e.g., based on union labor contracts), which makes the risk of serial correlation a challenge. We address both issues by estimating dynamic fixed-effects models that include pre-sample information on the dependent variable (i.e., wages before displacement). Lach and Schankerman (2008) introduce this approach, which does not rely on an assumption of strict exogeneity of the regressors but still leads to efficient estimators and accounts for the impact of unobserved fixed effects on the firm level. This approach has multiple advantages (Czarnitzki, Hottenrott, & Thorwarth, 2011; Salomon & Jin, 2010). In particular, it reduces the risk of serial correlation of errors and it allows for a dynamic, firm-specific component, in contrast to the static nature of most fixed-effect specifications.

We use two variables generated by pre-sample information. First, we use the wage of each displaced employee at the time that she entered the firm (i.e., at year *k*) that subsequently closed (W_k).

This allows us to control for any unobserved factors preceding employment in the focal firm. In a consistency check, we add the average annual increase in wages for each employee from the beginning of their employment at the firm (year *k*) up to the year before displacement (dW_{t-k}). This combination of variables allows us to split unobserved heterogeneity into a component that precedes employment at the particular firm and a component that precedes displacement. The estimation results support the validity of the main model. In an alternative specification, we use the average of the wages for the 2 years before displacement to control for unobserved heterogeneity (Czarnitzki et al., 2011). The results of the main model are unaffected.

Within this specification, Hypotheses 1, 2, and 3 are cross-model hypotheses that compare the coefficients for employees displaced from foreign MNC subsidiaries (Eq. 1) to those for their counterparts from domestic firms (Eq. 2). Comparisons of regression coefficients based on a simple Wald test are only appropriate if both subsamples can be assumed to be independent, that is, if the co-variance matrix is block diagonal. This is not a reasonable assumption in our case. Therefore, we estimate a simultaneous covariance matrix for both regression equations, which allows us to compare coefficients based on a Wald test.[4]

Hypotheses 4 and 5 can be tested based on the estimation models for displaced employees of foreign MNC subsidiaries only because the share of foreign equity and the number of expatriates in domestic firms are zero by definition. We add these independent variables (Z_t) as well as their squared terms to the estimation model (1) because the hypotheses predict a curvilinear relationship. We obtain:

$$W_{t+1} = \beta_1^{\mathrm{MNC}} X_t + \beta_2^{\mathrm{MNC}} C_t + \beta_3^{\mathrm{MNC}} W_k + \beta_4^{\mathrm{MNC}} dW_{t-k} + \beta_5^{\mathrm{MNC}} Z_t + \beta_6^{\mathrm{MNC}} Z_t^2 + e_{\mathrm{MNC}} \quad (3)$$

if displaced from an MNC.

Hypotheses 4 and 5 are supported if the coefficient of the linear variable (Z_t) is positive and significant,

Table 1a Descriptive statistics – Displaced employees from foreign MNC subsidiaries

Variable	Mean	Standard deviation	Minimum	Maximum
Wage in the new firm	8.491	7.488	1.8	141
Tenure in the old firm	2.802	3.039	0.0	33
Professionals/supervisors – old firm (d)	0.555	0.497	0.0	1
Managers – old firm (d)	0.150	0.357	0.0	1
Sales per worker – old firm (in thousands)	293.852	1113.630	0.3553	30,981
Foreign capital – old firm (share)	0.769	0.338	0.0	1
Expatriates – old firm	1.329	2.949	0.0	16
Entry wage – old firm	3.238	1.561	1.5	26
Sales per worker – new firm (in thousands)	200.566	1023.848	0.0165	49,516
Basic education (d)	0.216	0.411	0.0	1
Secondary education (d)	0.305	0.460	0.0	1
Tertiary education (d)	0.271	0.444	0.0	1
Gender (d)	0.448	0.497	0.0	1
Age	33.273	8.070	17.0	76
No industry switch after displacement (d)	0.865	0.342	0.0	1
Foreign nationality (d)	0.037	0.188	0.0	1
Employees with higher education – old firm (share)	0.215	0.223	0.0	1
Foreign capital – new firm (share)	0.432	0.466	0.0	1
Size – new firm	3531.350	5905.150	1.0	19,967
Location Lisbon/Oporto (d)	0.769	0.421	0.0	1
Fishery (d)	0.001	0.038	0.0	1
Mining and quarrying (d)	0.009	0.096	0.0	1
Manufacturing (d)	0.242	0.428	0.0	1
Production and distribution of electricity, gas, and water (d)	0.007	0.086	0.0	1
Construction (d)	0.033	0.179	0.0	1
Wholesale and retail; repair of motor vehicles (d)	0.292	0.455	0.0	1
Hotels and restaurants (d)	0.012	0.109	0.0	1
Transport, storage, and communications (d)	0.080	0.271	0.0	1
Financial activities (d)	0.145	0.352	0.0	1
Real estate, renting, and business services (d)	0.108	0.311	0.0	1
Education (d)	0.000	0.022	0.0	1
Health and social work (d)	0.001	0.038	0.0	1
Community, social, and personal services (d)	0.062	0.242	0.0	1
2006 (d)	0.156	0.363	0.0	1
2007 (d)	0.210	0.407	0.0	1
2008 (d)	0.192	0.394	0.0	1
2009 (d)	0.115	0.319	0.0	1
Observations	8139			

(d) indicates a dummy variable.

and the coefficient of the squared term (Z_t^2) is negative and significant.

Descriptive Statistics and Correlations

Table 1a provides descriptive statistics for the sample of employees displaced from the subsidiaries of foreign MNCs, while Table 1b provides the same statistics for their counterparts from domestic firms. Appendix A provides correlation coefficients for the independent and control variables for the sample of individuals displaced from MNC subsidiaries.[5] The descriptive statistics allow for the characterization of the average displaced employee in both samples. The average individual displaced from an MNC subsidiary and the average individual displaced from a domestic firm have similar ages (33 and 35, respectively) and lengths of tenure in the closing firms (2.8 years and 2.1 years, respectively). In addition, both were hired after the displacement by firms in the same industry. The average individual displaced from an MNC subsidiary has more years of education and earns more than the average individual displaced from a domestic firm.

Table 2 summarizes the flows of displaced employees in our sample. Employees displaced from MNC subsidiaries have a comparatively higher probability

Table 1b Descriptive statistics – Displaced employees from domestic firms

Variable	Mean	Standard deviation	Minimum	Maximum
Wage in the new firm	4.789	3.961	1.8	215
Tenure in the old firm	2.078	2.485	0.0	46
Professionals/supervisors – old firm (d)	0.529	0.499	0.0	1
Managers – old firm (d)	0.068	0.251	0.0	1
Sales per worker – old firm (in thousands)	170.811	2573.129	0.0272	123,431
Entry wage – old firm	2.597	1.038	1.1	33
Sales per worker – new firm (in thousands)	91.149	955.401	0.0072	259,818
Basic education (d)	0.255	0.436	0.0	1
Secondary education (d)	0.202	0.402	0.0	1
Tertiary education (d)	0.097	0.295	0.0	1
Gender (d)	0.390	0.488	0.0	1
Age	35.001	10.013	17.0	80
No industry switch after displacement (d)	0.840	0.366	0.0	1
Foreign nationality (d)	0.090	0.286	0.0	1
Employees with higher education – old firm (share)	0.082	0.179	0.0	1
Foreign capital – new firm (share)	0.072	0.246	0.0	1
Size – new firm	1153.375	3752.190	1.0	19,967
Location Lisbon/Oporto (d)	0.470	0.499	0.0	1
Fishery (d)	0.001	0.029	0.0	1
Mining and quarrying (d)	0.004	0.066	0.0	1
Manufacturing (d)	0.190	0.392	0.0	1
Production and distribution of electricity, gas, and water (d)	0.001	0.023	0.0	1
Construction (d)	0.201	0.400	0.0	1
Wholesale and retail; repair of motor vehicles (d)	0.223	0.417	0.0	1
Hotels and restaurants (d)	0.071	0.257	0.0	1
Transport, storage, and communications (d)	0.048	0.214	0.0	1
Financial activities (d)	0.017	0.130	0.0	1
Real estate, renting, and business services (d)	0.167	0.373	0.0	1
Education (d)	0.005	0.072	0.0	1
Health and social work (d)	0.024	0.153	0.0	1
Community, social, and personal services (d)	0.029	0.169	0.0	1
2006 (d)	0.144	0.351	0.0	1
2007 (d)	0.183	0.387	0.0	1
2008 (d)	0.192	0.394	0.0	1
2009 (d)	0.194	0.396	0.0	1
Observations	101,194			

(d) indicates a dummy variable.

of being hired by another MNC subsidiary. Hence there is reason to control for the hiring firm's share of foreign capital, and we do so in all estimations. However, Table 2 also shows that the human capital that becomes available to host-country firms after an MNC subsidiary closes is absorbed not only by other MNC subsidiaries but also by domestic firms.

We inspect the data set for signs of multicollinearity. The average variance inflation factor is 5.48, which is within commonly applied limits (see Brauer & Wiersema, 2012, for a discussion). To ensure that the estimation results are not biased by multicollinearity, we conduct consistency checks that rely on sample splits rather than the addition of squared terms. They provide no indication that multicollinearity affects the estimation results (see the Results section).

RESULTS

Tables 3 and 4 provide the results of the regression analyses. We report the coefficients of the dynamic fixed-effects regression models. Table 3 relates to Hypotheses 1, 2, and 3, while Table 4 relates to Hypotheses 4 and 5. Model I is the baseline model specification, which only includes the control variables for the full sample of MNC subsidiaries and domestic firms. Models II and III have the same specification but only include employees who are

Table 2 Flows of displaced workers

Sample of displaced employees hired by	Sample of displaced employees from		Total
	Foreign MNC	Domestic firm	
Foreign MNC	4,982	3,157	8,139
Domestic firm	8,993	93,001	101,994
Total			110,133

displaced from foreign MNC subsidiaries and employees who are displaced from domestic firms, respectively. Models IV and V introduce all of the independent variables with the exception of foreign capital and number of expatriates, which are tested separately in Table 4. Hypotheses 1, 2, and 3 predict that the effects of the productivity of the closing firm, tenure, and job functions on the employee's salary in the new job are different for individuals who are displaced from MNC subsidiaries than for individuals who are displaced from domestic firms. A comparison of the coefficients of Model IV and Model V allows us to test these hypotheses.

We hypothesize that the hiring firm uses the productivity of the closing firm, the employee's tenure at the closing firm, and whether the employee held a managerial position in the closing firm as signals of the future productivity of that employee. Our results are in line with our predictions, as the variables that proxy these three signals are positive and significant at the 0.1% level in all model specifications. Sales per employee of the closing firm, the two binary variables indicating whether the individual was a professional or a manager, and the number of years an employee worked in the closing firm positively influence wages of employees who are displaced from MNC subsidiaries (Model IV) and employees who are displaced from domestic firms (Model V).

Additional analyses are necessary to test for differences between displaced employees from MNC subsidiaries and domestic firms. We therefore compare the regression coefficients of Models IV and V, applying a seemingly unrelated estimator that combines the covariance matrix of both models. The results show that the coefficients of the productivity measure ($\chi^2(1) = 4.48$; significant at the 5% level) and of the managerial-function variables (professionals' $\chi^2(1) = 17.35$; managers' $\chi^2(1) = 27.17$; both significant at the 0.1% level) are significantly larger for the sample of employees displaced from foreign MNC subsidiaries than for the sample of employees displaced from domestic firms. The opposite relationship is found for the tenure variable – the coefficient is larger for the group of individuals displaced from domestic firms ($\chi^2(1) = 6.86$; significant at the 1% level).

These results support Hypotheses 1, 2, and 3. In line with our theoretical framework, the findings show that previous productivity and managerial job function are stronger signals of future productivity for employees displaced from foreign MNC subsidiaries than for their counterparts from domestic firms. Our results are also in line with our prediction that extended tenures in the subsidiaries of foreign MNCs generate more negative signals about the specificity of the employees' human capital than the signals generated in relation to similar tenures in domestic firms.

Table 4 presents the models that include the subsample of employees displaced from MNC subsidiaries (by definition, domestic firms cannot have foreign capital or expatriates). The models allow us to test Hypotheses 4 and 5. Model VI shows the model with all of the control variables and the independent variables introduced in Table 3. Model VII introduces the linear term of the foreign-capital variable, while Model VIII introduces the quadratic term. Models IX and X include the expatriate variables.

Model VIII in Table 4 shows that the linear term of the foreign-capital variable is positive and that the quadratic term is negative. Both are significant at the 0.1% level. These findings support Hypothesis 4, as a positive linear term and a negative quadratic term are necessary conditions for an inverse u-shaped relationship. The graph presented in Figure 1 also provides support for the existence of an inverse u-shaped relationship between the share of foreign capital and the salary of the displaced employee in a new firm. We calculate the location of the optimal point of foreign ownership, which lies at 69%. Notably, the optimal point is significantly above a majority share of 50% but significantly below the 100% associated with a wholly owned subsidiary.

In order to confirm the existence of a u-shaped relationship, we split the sample into two subsamples of firms with foreign ownership shares of more

Table 3 Results of dynamic fixed effects OLS regression on hourly salary in new firm

Sample of displaced employees from	I	II	III	IV	V
	Foreign MNC and domestic firm (full sample)	Foreign MNC	Domestic firm	Foreign MNC	Domestic firm
Tenure – old firm				0.005***	0.008***
				[0.001]	[0.000]
Professionals/supervisors – old firm (d)				0.076***	0.039***
				[0.009]	[0.002]
Managers – old firm (d)				0.294***	0.208***
				[0.014]	[0.005]
Sales per worker – old firm (log)				0.020***	0.010***
				[0.004]	[0.001]
Entry wage – old firm (log)	0.833***	1.038***	0.806***	0.921***	0.743***
	[0.004]	[0.013]	[0.004]	[0.013]	[0.004]
Sales per worker – new firm (log)	0.029***	0.014***	0.030***	0.012***	0.027***
	[0.001]	[0.003]	[0.001]	[0.003]	[0.001]
Basic education (d)	0.046***	0.056***	0.045***	0.047***	0.042***
	[0.002]	[0.011]	[0.002]	[0.011]	[0.002]
Secondary education (d)	0.123***	0.147***	0.119***	0.127***	0.108***
	[0.003]	[0.012]	[0.003]	[0.012]	[0.003]
Tertiary education (d)	0.322***	0.281***	0.324***	0.218***	0.271***
	[0.004]	[0.014]	[0.004]	[0.014]	[0.005]
Gender (d)	–0.095***	–0.088***	–0.098***	–0.086***	–0.096***
	[0.002]	[0.007]	[0.002]	[0.007]	[0.002]
Age	0.003***	0.005***	0.003***	0.004***	0.002***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
No industry switch after displacement (d)	0.009***	0.067***	0.006*	0.069***	0.004
	[0.003]	[0.012]	[0.003]	[0.012]	[0.003]
Foreign nationality (d)	–0.040***	–0.063***	–0.041***	–0.045**	–0.029***
	[0.003]	[0.018]	[0.003]	[0.017]	[0.003]
Employees with higher education – old firm (share)	0.266***	0.342***	0.245***	0.265***	0.195***
	[0.007]	[0.022]	[0.007]	[0.022]	[0.007]
Foreign capital – new firm (share)	0.059***	0.083***	0.048***	0.084***	0.050***
	[0.003]	[0.009]	[0.004]	[0.008]	[0.004]
Size – new firm (log)	0.011***	0.021***	0.009***	0.019***	0.011***
	[0.000]	[0.002]	[0.000]	[0.002]	[0.000]
Location Lisbon/Oporto (d)	0.018***	–0.001	0.021***	0.010	0.021***
	[0.002]	[0.011]	[0.002]	[0.010]	[0.002]
Fishery (d)	0.232***	0.226*	0.239***	0.183*	0.227***
	[0.031]	[0.096]	[0.032]	[0.093]	[0.032]
Mining and quarrying (d)	0.168***	0.367***	0.134***	0.346***	0.113***
	[0.015]	[0.055]	[0.015]	[0.053]	[0.015]
Manufacturing (d)	0.123***	0.234***	0.115***	0.192***	0.094***
	[0.007]	[0.042]	[0.007]	[0.041]	[0.007]
Production and distribution of electricity, gas, and water (d)	0.278***	0.360***	0.310***	0.259***	0.294***
	[0.028]	[0.058]	[0.040]	[0.056]	[0.039]
Construction (d)	0.118***	0.159***	0.115***	0.113*	0.096***
	[0.007]	[0.045]	[0.007]	[0.044]	[0.007]
Wholesale and retail; repair of motor vehicles (d)	0.148***	0.251***	0.141***	0.198***	0.111***
	[0.007]	[0.043]	[0.007]	[0.042]	[0.007]
Hotels and restaurants (d)	0.042***	0.112*	0.042***	0.079	0.026***
	[0.008]	[0.051]	[0.008]	[0.050]	[0.008]
Transport, storage, and communications (d)	0.316***	0.535***	0.295***	0.454***	0.260***
	[0.008]	[0.044]	[0.008]	[0.043]	[0.008]
Financial activities (d)	0.807***	1.046***	0.735***	0.930***	0.678***
	[0.009]	[0.044]	[0.010]	[0.044]	[0.010]

Table 3: (*Continued*)

Sample of displaced employees from	I	II	III	IV	V
	Foreign MNC and domestic firm (full sample)	Foreign MNC	Domestic firm	Foreign MNC	Domestic firm
Real estate, renting, and business services (d)	0.175***	0.240***	0.179***	0.197***	0.166***
	[0.007]	[0.043]	[0.007]	[0.042]	[0.007]
Education (d)	0.265***	–0.012	0.268***	–0.023	0.239***
	[0.014]	[0.154]	[0.014]	[0.149]	[0.014]
Health and social work (d)	0.056***	0.022	0.067***	–0.007	0.050***
	[0.009]	[0.095]	[0.009]	[0.093]	[0.009]
Community, social, and personal services (d)	0.233***	0.180***	0.259***	0.151***	0.239***
	[0.008]	[0.045]	[0.009]	[0.043]	[0.009]
2006 (d)	–0.002	0.017	0.005†	0.024†	–0.001
	[0.003]	[0.013]	[0.003]	[0.013]	[0.003]
2007 (d)	–0.002	0.037**	–0.003	0.015	–0.008**
	[0.003]	[0.012]	[0.003]	[0.012]	[0.003]
2008 (d)	0.033***	0.090***	0.030***	0.070***	0.021***
	[0.003]	[0.013]	[0.003]	[0.013]	[0.003]
2009 (d)	0.043***	0.032*	0.050***	0.017	0.034***
	[0.003]	[0.013]	[0.003]	[0.013]	[0.003]
Constant	–0.001	–0.356***	0.028*	–0.394***	0.005
	[0.011]	[0.055]	[0.011]	[0.061]	[0.013]
Observations	110,133	8139	101,994	8139	101,994
R^2	0.653	0.779	0.612	0.792	0.623
F-test	6899.111	954.243	5370.219	909.830	4947.820

†$p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; standard errors in parentheses.

than and less than 69%. Models B-I and B-II in Appendix B show the results. The coefficients of the foreign-capital variables are significant for both samples but have different signs – they are negative for the group of firms with a foreign-ownership share of more than 69% and positive for the group of firms below that limit. These findings confirm the existence of the inverse u-shaped relationship proposed in Hypothesis 4. In addition, we calculate the magnitude of the effect, as a significant difference from zero does not automatically imply a meaningful effect in large samples. We find that the salary of a displaced employee is 2.3% higher than the average for every standard deviation in foreign capital in the closed firm. Hence the effect is significant and has considerable magnitude.

In sum, the wage of a displaced employee in a new firm increases in line with the MNC's level of equity control over the closed subsidiary up to a certain point. Apparently, future employers use the share of foreign capital in the closed MNC subsidiary as a signal of the value and MNC specificity of that subsidiary's human capital. In this regard, an intermediate level sends optimal signals.

Model X in Table 4 shows that the linear term of the variable expatriates is positive and the quadratic term is negative, and both are significant at the 95% level. The optimal point occurs at 6.5 expatriates. However, the inverse u-shape is not confirmed when we test it with a sample split (models B-III and B-IV in Appendix B show the results). Hypothesis 5 is therefore rejected. We test an alternative specification in which we express the expatriates as a share of professionals and managers in the closed firm. This alternative operationalization takes into account that the number of potential expatriate positions is limited. Estimation results with this alternative operationalization also do not provide support for Hypothesis 5. The relationship is inversed u-shaped but the linear term is only significant at the 85% significance level. Estimation tables are available from the authors upon request.

The results for the control variables are in line with findings in the extant literature, which demonstrates the robustness of our model. Wages increase with education, age, and experience, and they are lower for female employees. At the firm level, firm size, knowledge intensity, and productivity are positively

Table 4 Results of dynamic fixed effects OLS regression on hourly salary in new firm – Displaced employees from foreign MNC

	VI	VII	VIII	IX	X
Tenure – old firm	0.005***	0.006***	0.008***	0.008***	0.008***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Professionals/supervisors – old firm (d)	0.076***	0.074***	0.073***	0.073***	0.069***
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]
Managers – old firm (d)	0.294***	0.293***	0.290***	0.290***	0.287***
	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]
Sales per worker – old firm (log)	0.020***	0.019***	0.020***	0.020***	0.020***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
Foreign capital – old firm		0.058***	0.480***	0.484***	0.513***
		[0.011]	[0.075]	[0.076]	[0.077]
Foreign capital squared – old firm			−0.348***	−0.352***	−0.376***
			[0.061]	[0.062]	[0.063]
Expatriates – old firm				0.000	0.009*
				[0.001]	[0.004]
Expatriates squared – old firm					−0.073*
					[0.028]
Entry wage – old firm (log)	0.921***	0.915***	0.915***	0.915***	0.913***
	[0.013]	[0.013]	[0.013]	[0.013]	[0.013]
Sales per worker – new firm (log)	0.012***	0.013***	0.012***	0.013***	0.013***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Basic education (d)	0.047***	0.049***	0.051***	0.051***	0.050***
	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]
Secondary education (d)	0.127***	0.127***	0.129***	0.129***	0.130***
	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]
Tertiary education (d)	0.218***	0.221***	0.222***	0.222***	0.223***
	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]
Gender (d)	−0.086***	−0.084***	−0.085***	−0.085***	−0.084***
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Age	0.004***	0.004***	0.004***	0.004***	0.004***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
No industry switch after displacement (d)	0.069***	0.072***	0.072***	0.072***	0.071***
	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]
Foreign nationality (d)	−0.045**	−0.046**	−0.045**	−0.045**	−0.048**
	[0.017]	[0.017]	[0.017]	[0.017]	[0.017]
Employees with higher education – old firm (share)	0.265***	0.283***	0.280***	0.280***	0.278***
	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]
Foreign capital – new firm (share)	0.084***	0.072***	0.076***	0.076***	0.078***
	[0.008]	[0.009]	[0.009]	[0.009]	[0.009]
Size – new firm (log)	0.019***	0.021***	0.021***	0.021***	0.020***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Location Lisbon/Oporto (d)	0.010	0.006	0.004	0.004	0.004
	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]
Fishery (d)	0.183*	0.164†	0.161†	0.160†	0.153
	[0.093]	[0.093]	[0.093]	[0.093]	[0.093]
Mining and quarrying (d)	0.346***	0.346***	0.310***	0.310***	0.319***
	[0.053]	[0.053]	[0.053]	[0.053]	[0.053]
Manufacturing (d)	0.192***	0.182***	0.186***	0.186***	0.191***
	[0.041]	[0.041]	[0.041]	[0.041]	[0.041]
Production and distribution of electricity, gas, and water (d)	0.259***	0.257***	0.258***	0.258***	0.265***
	[0.056]	[0.056]	[0.056]	[0.056]	[0.056]
Construction (d)	0.113*	0.116**	0.128**	0.129**	0.137**
	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]
Wholesale and retail; repair of motor vehicles (d)	0.198***	0.190***	0.198***	0.198***	0.205***
	[0.042]	[0.042]	[0.042]	[0.042]	[0.042]
Hotels and restaurants (d)	0.079	0.068	0.082†	0.082†	0.088†
	[0.050]	[0.050]	[0.050]	[0.050]	[0.050]

Table 4: (*Continued*)

	VI	VII	VIII	IX	X
Transport, storage, and communications (d)	0.454***	0.454***	0.456***	0.456***	0.457***
	[0.043]	[0.043]	[0.043]	[0.043]	[0.043]
Financial activities (d)	0.930***	0.914***	0.933***	0.934***	0.945***
	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]
Real estate, renting, and business services (d)	0.197***	0.188***	0.194***	0.195***	0.203***
	[0.042]	[0.042]	[0.042]	[0.042]	[0.042]
Education (d)	−0.023	−0.031	−0.025	−0.025	−0.019
	[0.149]	[0.149]	[0.149]	[0.149]	[0.149]
Health and social work (d)	−0.007	−0.021	−0.014	−0.013	−0.005
	[0.093]	[0.092]	[0.092]	[0.092]	[0.092]
Community, social, and personal services (d)	0.151***	0.137**	0.149***	0.150***	0.158***
	[0.043]	[0.043]	[0.043]	[0.044]	[0.044]
2006 (d)	0.024†	0.021†	0.015	0.015	0.015
	[0.013]	[0.013]	[0.013]	[0.013]	[0.013]
2007 (d)	0.015	0.017	0.011	0.011	0.008
	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]
2008 (d)	0.070***	0.062***	0.060***	0.059***	0.048***
	[0.013]	[0.013]	[0.013]	[0.013]	[0.014]
2009 (d)	0.017	0.009	0.005	0.004	0.010
	[0.013]	[0.013]	[0.013]	[0.013]	[0.013]
Constant	−0.394***	−0.447***	−0.531***	−0.533***	−0.553***
	[0.061]	[0.062]	[0.063]	[0.064]	[0.064]
Observations	8139	8139	8139	8139	8139
R^2	0.792	0.793	0.794	0.794	0.794
F-test	909.830	887.420	867.004	843.479	822.020

†$p<0.10$, *$p<0.05$, **$p<0.01$, ***$p<0.001$; standard errors in parentheses.

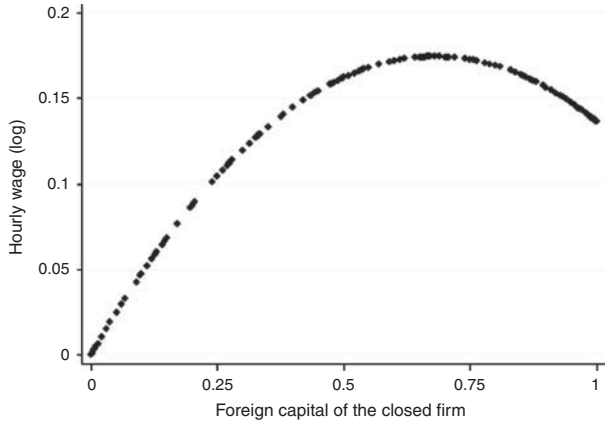

Figure 1 Foreign capital of the closed firm vs hourly wage.

related to wages. Overall, the results for the two samples are similar. However, there are two notable exceptions. First, the binary variable that identifies firms located in Portugal's two large metropolitan areas (Lisbon and Oporto) significantly influences the salary of employees displaced from domestic firms but not the wages of employees displaced from MNC subsidiaries. The descriptive statistics presented in Table 1a and Table 1b help explain this result. Almost 80% of the employees displaced from foreign MNC subsidiaries live in Lisbon and Oporto, while only 50% of the employees displaced from domestic firms live in these cities. Hence the variance in the subsample of displaced employees of foreign MNC subsidiaries is much lower.

Second, the effect of finding a new job in the same industry on salary is non-significant for displaced employees of domestic firms, while it is positive and significant for their counterparts from foreign MNC subsidiaries. We can only speculate about the underlying mechanisms. One possible explanation could be that the signals associated with transferring valuable foreign human capital to a new employer are industry specific and particularly strong when the markets and technologies of the old and new firms overlap.

Consistency and Sensitivity Checks

We conduct additional regressions in order to test the robustness of the empirical results.[6] First, we

eliminate alternative explanations. We argue that displaced employees from foreign MNC subsidiaries earn higher wages in the new firm because they have additional knowledge and skills gained from working in the MNC subsidiary. One alternative explanation could be that the observed difference in the earnings of the displaced employees of foreign MNC subsidiaries is associated with human capital that they acquired before they joined the subsidiary. In other words, MNC subsidiaries may not be better than domestic firms in improving human capital, but they may be better in selecting employees with more valuable human capital. In order to control for this alternative explanation, we conduct a consistency check in which we control for the salary level of the individuals when they join the MNC subsidiary and their average annual increase in salary. The latter variable isolates the human capital gained by the individual in the MNC subsidiary from the human capital she possessed when she joined the MNC (salary at entry). The results are reported in Model B-V of Appendix B. Both variables have positive and significant effects, but the main estimation results remain stable.

Second, we replaced these variables with the average salary of displaced employees 2 years before displacement to account for any recent, unobserved change in human capital and potential serial correlation. The estimation results of the main model are not affected.

Finally, we explore potential selection effects by including displaced employees who found a job more than 1 year following displacement.[7] The results supported our main model.

DISCUSSION AND CONCLUSION

In this study, we focus on the displaced employees of closed MNC subsidiaries. We investigate how the human capital that they acquired while working for an MNC subsidiary influences their wages after the subsidiary is closed. To answer this question we develop a theoretical framework which integrates insights from international business and labor economics. Our theoretical predictions based on this model are largely supported by the empirical results. We find that certain human capital leads to higher wages in new jobs when we compare the displaced employees of closed foreign MNC subsidiaries with their counterparts from closed domestic firms. However, the relationship depends on the presence of signals that the human capital is: (a) valuable in the host country and (b) not overly specific to the foreign MNC. While the closure may be due to comparisons within the MNC and with other countries, in terms of displaced employees' wages, positive signals originate from the productivity of the closed MNC subsidiary when compared with host-country standards. Displaced employees of foreign MNC subsidiaries also receive higher wages if they held managerial roles at the subsidiary, and if they had opportunities to absorb knowledge and build skills within the MNC. The tenure of a displaced employee in the closed MNC subsidiary sends negative signals because it suggests the increasing MNC specificity of human capital. The MNC's equity ownership in the closed subsidiary sends positive signals about the human capital of a displaced employee as long as it remains at intermediate levels. If the MNC held all or the vast majority of control in the closed subsidiary, the positive effect on the salary of displaced employees is lower because a new employer expects the employee's human capital to be specific to the MNC. Finally, our findings do not confirm our prediction that the number of expatriates in the closed subsidiary sends positive signals to new employers about the value of the human capital of the displaced employees.

Our theoretical model can be described as an employee displacement model for foreign MNC subsidiaries. It draws on and combines ideas from the international business and labor economics literatures. The latter has allowed us to learn about displacement *per se* while the former has enabled us to explore the specific situation of foreign MNC subsidiaries. The integrated model is superior to isolated approaches since it allows theorizing on questions which were previously blind spots on any of the two research agendas. Closing these theoretical blind spots through an interdisciplinary approach has high relevance given the increasing importance of FDI as well as its dynamics when MNCs change locations. Consequently, we expect that our findings will have implications for research in international business and labor economics in three primary ways.

First, we introduce displacement as a channel for flows of human capital between MNC subsidiaries and the host country, an element that has thus far been ignored in the literature (e.g., in the review by Meyer & Sinani, 2009). Our findings show that MNCs create a valuable pool of human capital for host-country firms when they close subsidiaries. The displaced employees differ from employees who are selectively hired from other companies in terms of their acquired knowledge and skills (Song et al., 2003). When an MNC closes a subsidiary, it voluntarily makes carriers of knowledge and skills available to the market. Two aspects of the importance of this

knowledge-flow channel are probably underestimated in current international business research. First, closures occur frequently (Berry, 2013). Second, transfers of knowledge and skills through individuals are highly efficient (individuals can transfer tacit knowledge) (Agrawal, 2006). At the same time, we find that closed MNC subsidiaries are heterogeneous in terms of the signals they send to new employers regarding the human capital of their displaced employees. Most intriguingly, the closure of an MNC subsidiary is not as negative an event for its displaced employees as closure is for displaced employees of domestic firms because the subsidiary may still be viewed as highly productive by host-country standards. Hence, we suggest that future studies will suffer from biases if they ignore the flow of human capital through displacement and if they assume that hiring host-country firms do not differentiate between various groups of displaced employees.

Second, our findings have implications for the field of labor economics in which the wage effects of displacement and foreign ownership have been largely disconnected. Job displacement has been intensively studied in labor economics (Kletzer, 1998), and labor economics models assume that employers set the salary of an employee based on signals of the value of the employee's human capital (Spence, 1973). Displacement is viewed as a negative signal for all employees and their future wages (Couch & Placzek, 2010). The negative signal associated with displacement is not uniform across all displaced employees, as the empirical evidence shows that the impact of displacement on the future salary of employees varies across industries, geographic locations, and job functions (Fallick, 1996; Jacobson, LaLonde, & Sullivan, 1993). However, the specific context of foreign MNC subsidiaries has been largely absent in discussions of this issue to date. Although the labor economics literature shows that foreign MNC subsidiaries generally pay higher wages than domestic firms (Hijzen et al., 2013; Malchow-Møller et al., 2013), a phenomenon referred to as a "foreign wage premium", it does not discuss the existence of a "signal for future wages" related to displaced MNC employees.

Our findings show that there is a link. The situation of displaced employees of MNC subsidiaries is significantly different from that of other displaced employees in the host country because the former had opportunities to acquire knowledge and skills that are otherwise unavailable. However, while this human capital is valuable in the host country, it is also specific to the MNC subsidiary and hence non-transferrable, at least in part. By addressing the specific situation of the displaced employees of closed MNC subsidiaries, we complement the labor economics literature on displacement. We show that the negative signal associated with displacement is, on average, weaker for individuals leaving foreign MNC subsidiaries than for those leaving domestic firms. We also identify the specific signals that employers use to evaluate the value and transferability of the human capital of employees displaced from MNC subsidiaries. Studies that ignore these particular signals are likely to suffer from biased results.

Finally, international business studies have found that an MNC's entry into a country tends to crowd out human resources in that country (de Backer & Sleuwaegen, 2003). Interestingly, the reverse cannot be assumed to be true when the MNC leaves. Instead, we find that some of the human capital that employees acquire while working for MNC subsidiaries is not valued by new employers because its use is too specific to the MNC subsidiary and cannot be transferred to the new job.

With regard to implications for practice, we suggest that three primary groups will benefit from our findings. First, job seekers can incorporate our findings into their decision making. Fully rational decision makers wish to maximize their earnings over the course of their careers. This includes the risk of being displaced. We find that the negative outcomes of such an event are comparatively lower if an employer provides substantial but not exclusive opportunities to acquire knowledge and skills within the MNC context, for example, by sending expatriates abroad. Such an employer should therefore be the preferable choice for a job seeker, all else equal. Second, the upper management of MNCs must consider the valuable strategic assets that are made available to host-country rivals in the form of displaced employees' knowledge and skills when a subsidiary is closed. MNCs must try to appropriate some of this value. If a subsidiary under consideration for closure is productive by host-country standards, then a sale would be preferable to closure. Finally, policymakers are often called upon to intervene when foreign MNC subsidiaries close. While the closure of foreign MNC subsidiaries can attract disproportionately more media attention, the displaced employees are generally better off than the displaced employees of strictly domestic firms. Our findings indicate that support measures, such as temporary employment agencies, subsidies, and job centers, are best directed toward displaced workers who have had few opportunities to acquire foreign

human capital, as the cuts in salary that they can expect in a new job are especially pronounced.

Our study highlights several opportunities to improve our understanding of the relationships that we discovered. First, not all types of knowledge, skills, abilities, and other characteristics of displaced employees can be assumed to be equally valuable in new jobs. We suspect that relational aspects and social capital (Corredoira & Rosenkopf, 2010; Dokko & Rosenkopf, 2010), for example, contacts with major foreign customers or suppliers, could be at least as valuable as technological knowledge. In this sense, dedicated studies could focus on differences between the human and social capital transferred by displaced employees.

Second, not all employees in an MNC subsidiary are equally exposed to MNC knowledge and practices. Some may work closely with colleagues in other subsidiaries and global headquarters, while others may largely deal with domestic issues. Accordingly, their opportunities to absorb foreign knowledge and acquire skills differ. Qualitative studies are required to examine such distinctions in more detail.

Third, the empirical results related to our control variables indicate that there are regional and industry effects that may interact with the relationships predicted in our model. We suggest that this would be a fruitful path for future research, one that would require dedicated theorizing and empirical testing.

Fourth, the reputation of a firm can be decoupled from its actual performance (Rindova, Williamson, Petkova, & Sever, 2005). Therefore the reputation of an MNC can influence the strength of the signals that we discuss in our hypotheses even when controlling for performance. However, our data do not provide a reliable measure of reputation. The size of our sample reduces the possible bias, but we believe that the link between MNC reputation and displaced employees' future wages might be a relevant topic for a dedicated study. Similarly, our theories are based on the specific nature of the human capital acquired while working in MNC. We cannot rule out the possibility that new employers do not value the foreign aspect *per se* but rather the attributes that are associated with it, such as an employee's exposure to complex organization structures. In this regard, a dedicated study that surveys employers in relation to their hiring decisions may be useful.

Finally, hiring firms can be assumed to be heterogeneous in their ability to interpret signals from displaced employees. We establish basic relationships at the level of the closing MNC subsidiaries. Future studies may want to explore interactions with characteristics of the hiring firms. Finally, we benefit from a large database, which allows for a broader representation of the results. Future studies may benefit from focusing on MNC-level variables and their effects on displacement.

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NOTES

[1]For convenience, we use the female form as a default whenever we refer to an individual employee, that is, by using "she" and "her." However, this does not in any way imply that the issues discussed here relate exclusively to women. All theoretical argumentations apply to male and female employees.

[2]Examples include the protests over pharmaceutical company Merck Organon's closure of its R&D center in the Netherlands, Nokia shifting its mobile phone production from Germany to Romania, and Deutsche Post closing its sorting center at Wilmington Airpark in Ohio.

[3]On the basis of this procedure, mergers and acquisitions cannot be ruled out. However, Mata and Portugal (2002) show that this problem only rarely occurs and that it does not affect MNC subsidiaries and domestic firms differently. Therefore this factor cannot be expected to bias our results.

[4]The estimation was conducted using the suest-command in Stata.

[5]The correlation table for the sample of individuals displaced from domestic firms presents similar results and is available upon request.

[6]All estimation results that are not included in the appendices are available from the authors upon request.

[7]We have not included employees who took more than 1 year to find a new job in our sample because we cannot observe them during a certain period of time. In this period, the employees might have been involved in activities (such as entrepreneurial or educational activities) that might influence their value for the new firm.

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APPENDIX A

Table A1 Correlation matrix of dependent and independent variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Wage in the new firm (log)	1.00																	
2	Tenure – old firm	0.07	1.00																
3	Professionals/supervisors – old firm (d)	0.06	0.02	1.00															
4	Managers – old firm (d)	0.55	0.01	–0.47	1.00														
5	Sales per worker – old firm (log)	0.46	0.11	0.18	0.17	1.00													
6	Foreign capital – old firm (share)	–0.02	–0.23	–0.07	–0.01	–0.11	1.00												
7	Expatriates – old firm	–0.10	–0.06	0.10	–0.08	0.04	0.08	1.00											
8	Entry wage – old firm (log)	0.62	0.04	–0.02	0.47	0.18	0.09	–0.07	1.00										
9	Sales per worker – new firm (log)	0.42	0.12	0.15	0.16	0.55	–0.16	–0.06	0.26	1.00									
10	Basic education (d)	–0.29	–0.05	0.03	–0.19	–0.12	–0.04	0.12	–0.16	–0.12	1.00								
11	Secondary education (d)	0.09	–0.03	0.15	–0.07	0.16	0.04	0.06	–0.00	0.11	–0.35	1.00							
12	Tertiary education (d)	0.54	–0.02	0.00	0.44	0.31	–0.06	–0.08	0.36	0.27	–0.32	–0.40	1.00						
13	Gender (d)	–0.14	0.11	0.13	–0.11	0.09	–0.15	0.08	–0.13	0.06	0.01	–0.01	0.05	1.00					
14	Age	0.10	0.24	–0.11	0.10	–0.12	–0.01	–0.18	0.17	–0.03	–0.15	–0.12	–0.05	–0.08	1.00				
15	No industry switch after displacement (d)	–0.01	0.12	–0.02	–0.04	0.03	–0.12	0.15	–0.17	–0.04	0.04	–0.04	–0.05	0.03	0.04	1.00			
16	Foreign nationality (d)	–0.08	–0.06	–0.07	–0.03	–0.11	0.05	0.02	–0.03	–0.09	–0.00	–0.02	–0.05	–0.04	0.06	–0.02	1.00		
17	Employees higher education – old firm (share)	0.55	0.02	0.05	0.37	0.48	–0.10	–0.06	0.31	0.41	–0.29	0.05	0.54	0.00	–0.03	–0.08	–0.06	1.00	
18	Foreign capital – new firm (share)	–0.01	0.09	–0.22	0.02	–0.07	0.30	–0.19	0.12	–0.04	–0.07	–0.10	0.03	–0.09	0.11	–0.11	0.02	0.02	1.00
19	Size – new firm (log)	0.07	0.08	0.11	–0.06	0.14	–0.26	0.17	–0.18	0.12	0.11	0.02	–0.05	0.09	–0.10	0.23	–0.07	–0.13	–0.22
20	Location Lisbon/Oporto (d)	0.24	–0.06	0.15	0.06	0.26	–0.02	0.09	0.05	0.34	–0.10	0.13	0.16	0.04	–0.05	–0.02	–0.05	0.25	–0.06
21	Fishery (d)	0.01	0.00	–0.00	0.03	–0.04	0.02	0.00	0.02	–0.00	–0.02	0.00	0.03	0.02	0.01	–0.06	0.01	0.05	0.01
22	Mining and quarrying (d)	0.04	–0.01	0.01	0.03	–0.17	–0.07	–0.04	0.09	–0.05	0.00	–0.04	0.02	–0.05	–0.00	0.03	–0.01	–0.04	–0.08
23	Manufacturing (d)	–0.15	0.12	–0.13	–0.06	–0.14	0.11	–0.12	0.05	–0.19	0.06	–0.11	–0.09	0.00	0.02	0.02	–0.01	–0.18	0.27
24	Production and distribution of electricity, gas, and water (d)	0.04	0.00	–0.02	0.07	0.03	–0.03	–0.04	0.04	0.11	–0.01	–0.01	0.05	–0.01	0.01	–0.18	0.01	0.06	0.05
25	Construction (d)	–0.04	–0.06	0.05	0.00	–0.09	–0.06	–0.03	0.07	–0.08	–0.02	–0.04	–0.03	–0.10	0.06	–0.01	0.04	–0.04	–0.09
26	Wholesale and retail; repair of motor vehicles (d)	–0.07	0.01	0.19	–0.09	0.14	–0.08	0.29	0.13	0.17	0.19	0.06	–0.12	0.18	–0.09	0.01	–0.06	–0.16	–0.19
27	Hotels and restaurants (d)	–0.09	–0.06	–0.01	–0.03	–0.08	0.05	0.07	–0.00	–0.07	0.03	–0.02	–0.05	0.03	–0.01	–0.05	0.06	–0.07	–0.08
28	Transport, storage, and communications (d)	0.10	0.06	0.01	0.07	0.16	–0.16	0.13	–0.09	0.17	–0.06	0.01	0.13	–0.02	–0.02	–0.02	–0.01	0.31	0.03
29	Financial activities (d)	0.40	–0.02	0.16	0.10	0.33	–0.08	–0.18	–0.18	0.20	–0.20	0.16	0.21	–0.03	–0.06	0.11	–0.03	0.21	–0.27

30	Real estate, renting, and business services (d)	–0.00	–0.09	–0.12	0.09	–0.13	0.09	–0.06	0.09	–0.13	–0.02	0.02	0.06	–0.05	0.01	–0.14	0.02	0.16	0.06
31	Education (d)	–0.03	–0.02	–0.01	–0.01	–0.03	0.01	0.01	–0.01	–0.03	0.00	0.01	–0.01	0.01	–0.02	–0.01	0.03	–0.00	–0.01
32	Health and social work (d)	–0.03	–0.02	–0.02	0.01	–0.04	0.02	0.00	–0.01	–0.02	0.01	–0.02	0.02	0.03	–0.01	–0.03	–0.01	0.00	–0.01
33	Community, social, and personal services (d)	–0.22	–0.04	–0.23	–0.09	–0.31	0.17	–0.11	–0.18	–0.19	–0.07	–0.12	–0.12	–0.14	0.17	0.09	0.08	–0.17	0.26
34	2006 (d)	–0.12	–0.08	–0.16	–0.04	–0.20	0.19	–0.17	0.01	–0.07	–0.06	–0.11	–0.04	–0.14	0.13	–0.34	0.08	–0.06	0.33
35	2007 (d)	–0.17	0.08	0.02	–0.08	–0.02	–0.19	–0.08	–0.07	–0.09	0.21	–0.08	–0.14	0.10	–0.04	0.20	–0.03	–0.22	–0.07
36	2008 (d)	0.03	–0.03	0.04	0.04	0.18	–0.04	0.44	0.01	0.11	0.04	0.00	0.05	0.08	–0.08	0.19	–0.02	0.19	–0.15
37	2009 (d)	–0.02	0.03	0.00	0.03	–0.05	0.12	0.14	0.07	–0.05	–0.02	0.05	0.02	–0.00	0.04	0.14	0.01	0.04	–0.01

		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
19	Size – new firm (log)	1.00																		
20	Location Lisbon/Oporto (d)	0.34	1.00																	
21	Fishery (d)	–0.04	–0.06	1.00																
22	Mining and quarrying (d)	–0.00	–0.16	–0.00	1.00															
23	Manufacturing (d)	–0.16	–0.42	–0.02	–0.05	1.00														
24	Production and distribution of electricity, gas, and water (d)	–0.02	0.04	–0.00	–0.01	–0.05	1.00													
25	Construction (d)	–0.14	–0.16	–0.01	–0.02	–0.10	–0.02	1.00												
26	Wholesale and retail; repair of motor vehicles (d)	0.17	0.21	–0.02	–0.06	–0.36	–0.06	–0.12	1.00											
27	Hotels and restaurants (d)	–0.10	–0.07	–0.00	–0.01	–0.06	–0.01	–0.02	–0.07	1.00										
28	Transport, storage, and communications (d)	–0.07	0.07	–0.01	–0.03	–0.17	–0.03	–0.05	–0.19	–0.03	1.00									
29	Financial activities (d)	0.29	0.22	–0.02	–0.04	–0.23	–0.04	–0.08	–0.26	–0.05	–0.12	1.00								
30	Real estate, renting, and business services (d)	–0.13	0.06	–0.01	–0.03	–0.20	–0.03	–0.06	–0.22	–0.04	–0.10	–0.14	1.00							
31	Education (d)	–0.03	–0.01	–0.00	–0.00	–0.01	–0.00	–0.00	–0.01	–0.00	–0.01	–0.01	–0.01	1.00						
32	Health and social work (d)	–0.04	–0.02	–0.00	–0.00	–0.02	–0.00	–0.01	–0.02	–0.00	–0.01	–0.02	–0.01	–0.00	1.00					
33	Community, social, and personal services (d)	–0.00	0.13	–0.01	–0.02	–0.15	–0.02	–0.05	–0.17	–0.03	–0.08	–0.11	–0.09	–0.01	–0.01	1.00				
34	2006 (d)	–0.13	–0.02	–0.02	–0.04	–0.06	0.06	–0.03	–0.08	0.06	–0.03	–0.17	0.01	0.01	0.00	0.49	1.00			
35	2007 (d)	0.14	–0.06	–0.02	–0.05	0.05	–0.02	–0.06	0.31	–0.06	–0.04	–0.17	–0.14	0.00	–0.00	–0.09	–0.22	1.00		
36	2008 (d)	0.11	0.01	–0.02	–0.05	–0.11	–0.04	0.05	0.16	0.01	0.24	–0.19	0.01	–0.01	–0.01	–0.11	–0.21	–0.25	1.00	
37	2009 (d)	–0.25	–0.04	0.03	–0.03	0.07	–0.03	0.08	–0.01	0.03	–0.03	–0.11	0.08	0.03	0.03	–0.08	–0.15	–0.19	–0.18	1.00

APPENDIX B

Table B1 Consistency check estimations on hourly salary in new job for displaced employees of foreign MNC subsidiaries

	(1) (B-I)	(2) (B-II)	(3) (B-III)	(4) (B-IV)	(5) (B-V)
	Subsample: Closed MNC subsidaries with more than 69% foreign capital	Subsample: Closed MNC subsidaries with less than 69% foreign capital	Subsample: Closed MNC subsidaries with more than six expatriates	Subsample: Closed MNC subsidaries with less than six expatriates	With yearly wage increase at the closing MNC subsidiary
Tenure – old firm	0.028***	–0.000	0.054***	0.004**	0.011***
	[0.002]	[0.002]	[0.009]	[0.001]	[0.001]
Professionals/supervisors – old firm (d)	0.075***	0.039*	0.115**	0.071***	0.066***
	[0.011]	[0.015]	[0.045]	[0.009]	[0.009]
Managers – old firm (d)	0.309***	0.237***	0.295***	0.293***	0.273***
	[0.017]	[0.023]	[0.090]	[0.014]	[0.014]
Sales per worker – old firm (log)	0.027***	–0.013†	0.115	0.021***	0.018***
	[0.004]	[0.007]	[0.093]	[0.004]	[0.004]
Foreign capital – old firm	–0.158†	0.225***		0.068***	0.558***
	[0.087]	[0.053]		[0.012]	[0.076]
Foreign capital squared – old firm					–0.413***
					[0.062]
Expatriates – old firm	0.012**	0.058*	0.009	0.017***	0.008*
	[0.005]	[0.027]	[0.008]	[0.003]	[0.004]
Expatriates squared – old firm	–0.079*	–0.379			–0.057*
	[0.033]	[0.461]			[0.028]
Entry wage – old firm (log)	0.902***	1.012***	0.669***	0.956***	0.903***
	[0.017]	[0.025]	[0.066]	[0.014]	[0.013]
Yearly wage increase at the closing MNC					0.164***
					[0.012]
Sales per worker – new firm (log)	0.019***	0.013	0.080***	0.012***	0.015***
	[0.004]	[0.008]	[0.017]	[0.003]	[0.003]
Basic education (d)	0.050***	0.043*	0.036	0.044***	0.050***
	[0.014]	[0.018]	[0.055]	[0.011]	[0.011]
Secondary education (d)	0.127***	0.094***	0.093†	0.125***	0.124***
	[0.014]	[0.020]	[0.055]	[0.012]	[0.011]
Tertiary education (d)	0.220***	0.191***	0.269***	0.210***	0.213***
	[0.017]	[0.024]	[0.075]	[0.014]	[0.014]
Gender (d)	–0.079***	–0.076***	–0.127***	–0.072***	–0.079***
	[0.009]	[0.012]	[0.029]	[0.007]	[0.007]
Age	0.003***	0.005***	0.007*	0.004***	0.004***
	[0.001]	[0.001]	[0.003]	[0.000]	[0.000]
No industry switch after displacement (d)	0.069***	0.054†		0.073***	0.063***
	[0.014]	[0.029]		[0.012]	[0.012]
Foreign nationality (d)	–0.035	–0.078*	0.054	–0.062***	–0.042*
	[0.020]	[0.038]	[0.085]	[0.017]	[0.017]
Employees with higher education – old firm (share)	0.280***	0.097†		0.223***	0.268***
	[0.028]	[0.050]		[0.022]	[0.022]
Foreign capital – new firm (share)	0.058***	0.050*	–0.111*	0.075***	0.072***
	[0.010]	[0.022]	[0.053]	[0.009]	[0.009]
Size – new firm (log)	0.025***	0.012**	0.026**	0.020***	0.020***
	[0.002]	[0.004]	[0.009]	[0.002]	[0.002]
Location Lisbon/Oporto (d)	–0.019	0.087***	0.215**	0.011	0.006

Table B1: (*Continued*)

	(1) (B-I)	(2) (B-II)	(3) (B-III)	(4) (B-IV)	(5) (B-V)
	Subsample: Closed MNC subsidaries with more than 69% foreign capital	Subsample: Closed MNC subsidaries with less than 69% foreign capital	Subsample: Closed MNC subsidaries with more than six expatriates	Subsample: Closed MNC subsidaries with less than six expatriates	With yearly wage increase at the closing MNC subsidiary
	[0.012]	[0.023]	[0.075]	[0.010]	[0.010]
Fishery (d)	0.036			0.166†	0.087
	[0.099]			[0.089]	[0.092]
Mining and quarrying (d)	0.215	0.438***		0.359***	0.306***
	[0.140]	[0.073]		[0.051]	[0.053]
Manufacturing (d)	0.098†	0.308***	0.089	0.190***	0.168***
	[0.051]	[0.065]	[0.377]	[0.039]	[0.040]
Production and distribution of electricity, gas, and water (d)	0.342***	0.315***		0.285***	0.238***
	[0.074]	[0.088]		[0.054]	[0.056]
Construction (d)	0.056	0.208**	0.297	0.117**	0.122**
	[0.056]	[0.070]	[0.392]	[0.042]	[0.044]
Wholesale and retail; repair of motor vehicles (d)	0.135**	0.308***	0.259	0.198***	0.174***
	[0.052]	[0.071]	[0.371]	[0.040]	[0.042]
Hotels and restaurants (d)	0.021	0.220*	0.080	0.115*	0.077
	[0.060]	[0.098]	[0.379]	[0.050]	[0.049]
Transport, storage, and communications (d)	0.362***	0.573***	0.565	0.441***	0.412***
	[0.054]	[0.075]	[0.397]	[0.042]	[0.043]
Financial activities (d)	0.783***	1.226***	0.386	0.950***	0.869***
	[0.055]	[0.074]	[0.522]	[0.042]	[0.044]
Real estate, renting, and business services (d)	0.121*	0.374***	0.281	0.204***	0.171***
	[0.052]	[0.070]	[0.375]	[0.040]	[0.042]
Education (d)	–0.171	0.426	0.297	–0.074	–0.070
	[0.176]	[0.270]	[0.558]	[0.163]	[0.147]
Health and social work (d)	–0.018	–0.173		–0.025	–0.032
	[0.105]	[0.195]		[0.091]	[0.091]
Other services, community, social, and personal (d)	0.102†	0.261*	0.051	0.156***	0.132**
	[0.053]	[0.108]	[0.406]	[0.042]	[0.043]
2006 (d)	–0.010	0.070*		0.025*	0.021†
	[0.015]	[0.029]		[0.012]	[0.013]
2007 (d)	–0.003	0.013		0.013	0.017
	[0.015]	[0.032]		[0.011]	[0.012]
2008 (d)	–0.029†	0.164***		0.088***	0.052***
	[0.017]	[0.028]		[0.014]	[0.014]
2009 (d)	–0.040*	0.058*		0.019	0.016
	[0.016]	[0.027]		[0.013]	[0.013]
Constant	–0.302**	–0.322**	–2.427*	–0.486***	–0.543***
	[0.114]	[0.120]	[1.231]	[0.060]	[0.064]
Observations	5641	2498	709	7430	8139
R^2	0.796	0.817	0.475	0.817	0.799
F-test	590.197	306.207	24.713	915.184	824.487

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; standard errors in parentheses.

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