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Conference Paper

Human capital and firm's propensity to relocate: do jobs follow people?

55th Congress of the European Regional Science Association: "World Renaissance: Changing roles for people and places", 25-28 August 2015, Lisbon, Portugal

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Morkute, Gintare (2015) : Human capital and firm's propensity to relocate: do jobs follow people?, 55th Congress of the European Regional Science Association: "World Renaissance: Changing roles for people and places", 25-28 August 2015, Lisbon, Portugal, European Regional Science Association (ERSA), Louvain-la-Neuve

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Human capital and firm relocation: why footloose firms are a rare breed

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Abstract

This paper examines the role that human capital plays in firm's strategic decisions. It focuses on long-distance corporate relocations which present certain trade-offs in terms of human capital and modifies firms' relationship with the labour force. It is assessed to what extent having (an access to) employees with desired characteristics can deter firm's relocation and to what extent the relocating firms upgrade their (access to) workforce. Based on literature analysis, three aspects of human capital are identified as creating value to the firm: 1) skill level of employees, 2) quality of job matches, characterised by firm-specificity and embeddedness of human capital, 3) accessibility of external labour force. The role of all three aspects as both keep and pull factors is tested using register data on single-plant firms in the Netherlands in 2006-2011. The results demonstrate that firms show a strong attachment to the employees and retaining labour force is an important consideration of relocating firms. Long-distance relocations are infrequent and they happen predominantly among firms that have very long commuting and hiring distances already before the relocation, which indicates low dependence on the local labour markets and enables long moves with little increase to the employees' commutes. Firms are neither kept put by having employees with high skill level nor do they use relocation to upgrade the skill level. The quality of job matches and access to external workforce affect firm's relocation decisions, but only as keep factors. The asymmetry between their role in keeping firms put and attracting firms is indicative of footloose firms being indifferent to local differentials pertaining to human capital rather than being motivated by them. It also suggests that (access to) human capital primarily has an anchoring role as the complex relationships linking firms to both internal and external labour force cannot be easily replicated elsewhere or well estimated before the relocation. The paper is concluded by noting that in the case of firm relocation human capital differentials do not contribute to redistribution of employment; rather it is one of the forces that maintain the present job distribution. Firms are rooted due to the human capital they have; they tend not to search opportunistically for greener pastures. Skill level of the employees has no bearing on this

rootedness, rather it is determined by the culture and human resource practices of the firm itself as well as by its dependence on the local labour markets. The findings suggest that in understanding how human capital creates value more attention should be paid not only to cognitive/physical/other abilities of an individual, but also the context-specific possible uses for them.

Keywords: Firm relocation, rootedness, human capital, human resources

JEL classifications: J23, J24, R12, R30.

1. Introduction

This paper examines the role that human capital plays in firms' strategic location decisions. It focuses on long-distance corporate relocations which present certain trade-offs in terms of human capital and modifies firms' relationships with the labour force. It is assessed to what extent having (an access to) employees with desired characteristics can deter firms' relocation and to what extent the relocated firms improve their (access to) workforce. The findings contribute to understanding the ambiguous role of human capital in firms' strategic decisions.

It has been argued that the relative importance of human capital has soared in comparison to that of other factors of production. This, together with increased variation in human capital that the employees possess, puts pressure on firms and regions to find the right strategies to have the best human capital (see e.g. Drucker, 1993, Florida, 2002, Moretti, 2012, 215-249, Pfeffer, 1994, 1998, Michaels et al., 2001). Opponents argue that the increased demand for human capital has been (more than) matched by the increased human capital levels that the employees possess and by easier access to the labour force globally, eliminating the need for the firms to go to great lengths to attract and retain human capital (Brown et al., 2011, Brown et al., 2008). To add to the confusion, there is also no consensus on exactly which human capital and in which ways creates value to the firm and thus justifies the adjustments made by the firm in terms of location adjustment (see e.g. Pfeffer, 2001).

If human capital has become decisive as compared to other production/location factors, this shift should also be reflected in firms' relocation behaviour (see Florida (2002), Gottlieb (1995) on the spatial aspects of human capital and employment). Firm relocation research has acknowledged that considerations pertaining to both the internal labour force and labour market in general are potentially of influence in firms' relocation decisions (van Dijk and Pellenbarg, 2000, 197-198, van Dijk and Pellenbarg, forthcoming). Regardless, human capital has received limited attention in empirical analyses in the firm relocation literature. It has been confined to including wage levels (Kronenberg, 2013) or aspects of human capital as crude regional characteristics (e.g. Holl, 2004, Weterings and Knoben, 2013) as some of the explanatory variables.

There are two main contributions that this paper makes. Firstly, it addresses the ambiguity around the role of human capital by examining its influence on an important strategic decision – long-distance relocation. The corporate relocation policy evaluations and advice typically

focus on relocating the employees together with the firm as the key determinant of the success of the relocation (Cooper, 1996, Munton et al., 1993, Sagie et al., 2001). However, little is known about how the relative spatial immobility of the employees enters the picture before the actual relocation in the relocation decision making process, to what extent the risk of not successfully moving the employees can deter the relocation and to what extent the relocation itself improves the access to and the job relationships with the new and current employees. Secondly, the paper contributes to a better understanding of regional economic dynamics. One of the most prominent debates in regional and urban economics focuses around the question ‘do jobs follow people or do people follow jobs?’ (Partridge and Rickman, 2003). Since the early 2000s the focus of the debate has very much shifted to understanding people’s migratory decisions (mostly because of the influential book *The rise of creative class* (Florida, 2002) with its emphasis on people’s migration as the driver of regional economic dynamics); whereas the mechanisms in which the presence of human capital motivates employment creation or relocation have been disregarded and still remain unclear.

The paper is organised in the following way. The second chapter elaborates on the role of different dimensions of human capital in overall firm’s strategy. In the third chapter the hypotheses are formulated on the influence of human capital role on firm’s spatial behaviour. Empirical strategy and results are presented in the fourth and fifth chapters. Lastly, the conclusions are given.

2. The role of human resources on firm spatial behaviour

I suggest that firms are attracted to locations with human capital that creates value to the firms. In this section I discuss exactly how human capital can influence their relocation decisions.

Firstly, in firm relocation decisions human capital can function both as a keep factor and as a pull factor; and pull and keep effects need not be symmetrical. Long-distance relocations are often linked to substantial losses in sunk costs, in terms of material assets, spatially immobile clientele and relations and networks (see e.g. Knoblen and Oerlemans, 2008, Knoblen, 2011). This leads to a question whether firms can easily respond to spatial differentials in human capital levels or whether there is a certain rootedness related also to human capital. Some authors focus on human capital as a pull factor, arguing that spatial differentials in human capital redistribute the employment (though the mechanisms of redistribution are not

explicitly mentioned— see Florida (2002)). Others argue that the risk of losing employees keeps firms put, thus seeing human capital as a keep factor (Stam, 2007).

Secondly, as the literature provides a wealth of explanations why human capital (or the human resources in management literature) is important, I describe the different views taken on how human capital creates value for the firm. The most prominent view on the role of human capital is the ‘War for talent’ (further referred to as WfT) view (Michaels, 2001, Smart, 2005). In *The War for Talent* Michaels et al. (2001) describe the shift from ‘the old reality’ where people need companies to ‘the new reality’ where companies need people, or rather talents (p.6). Human capital is argued to play a key role in ensuring firm’s competitive edge; a firm’s strategy should be shaped to appeal to talented people (p.16). In the WfT view, talent is possessed by individual employees, it does not depend on firm-specific environment and it can be easily transferred between jobs. Organisational performance is seen as the aggregation of individual abilities.

An alternative approach stems from the framework of resource-based view of a firm. The framework has originally been laid out by Barney (1991) who distinguishes between three sorts of resources that could lead to comparative advantage of the firm: physical resources, organisational resources and human resources, and the conditions needed for those resources to lead to a sustainable competitive advantage: they need to create value in a unique way that cannot be easily duplicated by the competitors. Building up on Barney (1991), many elaborations followed of why and how the human resources could become the comparative advantage of the firm (Lado and Wilson, 1994, Wright et al., 2001, Barney and Wright, 1998, Wright et al., 1994, Boxall, 1998). This view (henceforth referred to as ‘competitive advantage through people’, CA_TP) focuses on firm-level environment rather than abilities of individual employees. While the importance of hiring competent people is stressed (Pfeffer 1994, 33-34), organization, culture and synergies are argued to be more important than individual talent (Pfeffer, 2001, for supporting empirical evidence see Groysberg et al., 2008). The stress on firm-level environment partially stems from emphasizing the sustainability of the competitive advantage: the competitive advantage that is derived from having talented employees can be easily duplicated by competitors; it is the culture and synergies that create value and that cannot be easily replicated. The competitive advantage can be sustained ‘through facilitating the development of competencies that are firm specific, produce complex social relationships, are embedded in a firm's history and culture, and generate tacit

organizational knowledge' (Lado and Wilson, 1994, 699). Additionally, other accounts argue that also in short-term good teams outperform lonely stars and that the firms should focus on teamwork rather than on stars. Overemphasizing talent results in worse performance of other employees, diverts the attention from building systems and cultures and undermines learning and knowledge sharing within organisations (Pfeffer, 2001).

Building on the resource-based view of a firm the extended resource-based view of a firm has been suggested (Mathews, 2003, Lavie, 2006). While its predecessor sees firms as 'encapsulated bundles of resources and routines' (Mathews, 2003, 116), the extended view recognises that firms share the resources and learn from the routines developed by others around them, hence with regard to human resources the firms rely also on the local labour market to provide employees. A more outwards-oriented firm might benefit from knowledge sharing and employee learning (Eriksson and Lindgren, 2008), as well as being able to respond flexibly to fluctuations in the demand for production, in which case the comparative advantage is not concentrated in the firm but in the local mobility cluster.

To conclude, three approaches to the value that human capital creates for the firm are the following: 1) firms derive value primarily from the talent that is possessed by employees and transferable between jobs; 2) firms derive value primarily from the quality of labour matches with the internal employees. The quality of labour match is defined by embeddedness in the firm and firm-specific human capital; 3) Firms derive value from easy access to external human capital and local knowledge. They each lead to testable hypotheses regarding the link between human capital and firm relocation.

3. Hypotheses

In this section the hypotheses are formulated to test whether the three dimensions of human capital discussed in the previous chapter function as pull/ keep factors in firms' relocation decisions. If, as proposed by the WfT view, talent is the key aspect of human capital generating value to the firm, it can be expected that high skill levels act both as keep and pull factor.

H1a Skill level in the firm is negatively associated with its propensity to relocate.

H1b Skill level in relocated firms is higher than before relocation.

If, as proposed by the CA_TP view, job matching quality reflects the value of human capital to the firm, the firms having good labour matches are less likely to exit the region. Indeed, Stam (2007) shows that a firm's reluctance to relocate is attributable to firm-specific capital possessed by the employees and to perceived difficulty to replicate complex job relationships in another location with other employees. Stam cites an entrepreneur stating 'You must take account of the fact that about half your team will say: I'm not coming with you, and... so, what does that mean? Is your continuity put at risk? Yes, perhaps a little. And then you must think about it. For some of it you wouldn't want to move at all.' (p.40). Also, if firms are not successful in fostering high quality jobs matches, new location might be selected to provide them with opportunities for better matches.

H2a Firms with high quality labour matches have a lower propensity for long distance relocation.

H2b The quality of labour matches in relocated firms is higher than before relocation.

However, a more outward-oriented firm focuses more on the labour force accessibility in the market than on its own labour force. Such a firm is kept put by a good spatial match with the external labour force. Similarly, the prospect of good labour accessibility could function as a pull-factor.

H3a Firms with a worse access to labour force have a higher propensity for long-distance relocation.

H3b The access to labour force in relocated firms is better than before relocation.

In addition, I suggest that also the spatial match with the current employees functions as a keep factor. The link between spatial match with the current employees and the propensity to relocate is seen as a cross-over between H2a and H3a. Good spatial match with the current employees is a result of having a good access to new employees combined with the willingness of the employees to invest in location adjustments pertaining to the job.

H4 Firms with a worse spatial match with the internal labour force have a higher propensity for long-distance relocation.

4. Empirical strategy

4.1. Data and approach

Rich register data provided by Statistics Netherlands is used. The datasets contain micro-level information, linking firms, jobs and people. The data allows me to trace the changes in firm's location, firms' employee composition and employees' residential locations. The datasets cover Dutch labour market from year 2006 to year 2011 with the location of the firms recorded once a year at the end of the year. The final dataset consists of firm-year records. I determine whether a firm has relocated between municipalities by comparing the location in two subsequent years.

The decision making with regard to relocation is different depending on the relocation distance (Weterings and Knoben, 2012). Aiming to identify the moves that considerably modify the distance to old and potential new employees, I select only the relocations over distances greater than 30 km, measured between the centres of municipalities. Since the commuting distances are fairly short in the Netherlands— in the selected firms median commuting distance at personal level is 6.1 km, 80th percentile is 19.5 km— such a relocation has a considerable impact on the spatial firm-employee relationships. Since I am only interested in moves that present certain trade-offs between locations, the focus lies solely on one-plant firms and complete relocations. Additionally, the considerations on the role of human resources mainly apply to independent business entities rather than state-owned establishments or households. That is why I exclude sectors in which these entities are prevalent. Also excluded are the sectors with activities that strongly rely on location-specific natural resources. Their location behaviour depends predominantly on the characteristics pertaining to those resources. The analyses also do not cover temporary employment agencies; due to their mediating role I expect the job relationships between them and the temporary labour force to be somewhat atypical; unfortunately the data does not allow linking the temporary labour force to the firms where the actual work is performed (see Table 1A in the Appendix for a list of excluded sectors). Firms with one employee only are not selected for the analyses since in one-person firms the notion of human resources management becomes somewhat nonsensical and it cannot be distinguished between personal and business-related relocation motives. Koster and Venhorst (2014) show that living and working locations in this case often overlap and residential motives are leading in location adjustments.

Thus the initial selection (also additional adjustments are made dictated by the design of individual analyses) constitutes of firm-year records of all firms located in the Netherlands for which the location and the sector are known, that are assigned to NACE rev.2 sectors other than those listed in Table 1A, that remain single-plant throughout the timespan analysed and that can be linked to at least two employees on 31 December in all the years when they are in the dataset. For consistency over time, if there are missing values in some years, the firm is excluded completely. To be selected, the firms also have to be in the dataset for at least two consecutive years. This requirement is added as some variables are calculated using flow data from the whole year or use input from the previous year (for instance, employment growth). As the firms are followed before and after the relocation, only firms with one relocation recorded in the timespan analysed are included in order to be able to assign records to time categories unambiguously (they also form the majority of relocated firms: 95.1% of all relocated firms have relocated only once in the timespan analysed). This leaves us with a selection of 594269 firm-year records, out of which 1830 indicate long-distance relocation.

Firms are followed in time before and after the relocation. They can be followed from the fourth year before the relocation at earliest to the fourth year after the relocation at latest, but no firm can be observed both in the fourth year before the relocation and in the fourth year after the relocation. Depending on how long the firms are in the dataset and when they relocate, there are different firms included under different time references (for instance, second year after relocation, first year before relocation). In addition, due to both left and right censoring some firm-year records in the dataset cannot be identified as preceding or succeeding the relocation. For instance, as the dataset consists of firm records in the time period from 2006 to 2011, year 2011 record would not be labelled as preceding the relocation in 2012. Yet as those false negatives account for a very small share of the non-relocated firms group with which the relocated firms have been compared, it is unlikely that their reclassification could considerably affect the results. Additionally, I am interested in genuine long-term changes in (the access to) human capital in a firm, yet as I show in descriptive statistics in section 5.1, the relocation also has short-term disruptive effects in job relationships until the firms and the employees adjust. To eliminate those short-term effects, I mostly focus on firm-year records that do not directly precede/succeed relocation.

4.2. Models specification

In the first place, binary logistic regression is conducted to predict a firm's propensity to relocate. In order to eliminate the short-term turbulence around the relocation, the independent variables are lagged two years with regard to dependent variable. As result, only firms are included that are in the dataset for at least four consecutive years.

When calculating the firm-level aggregates from individual jobs, jobs are weighted by their workload (in full time equivalents). Inverse hyperbolic sine (IHS) transformation is applied to several variables to decrease the influence of outliers. It has the benefit (as opposed to log transformations) of being defined also at non-positive values of the argument. For the variables that are calculated at individual job level and then aggregated for the firm, the transformations are performed before the aggregation (transformations are not applied in the descriptive statistics). All the distances are measured between the centres of municipalities.

The main independent variables correspond to the dimensions of human capital that have been identified as creating value to the firm in sections 2 and 3: skill level of the employees, quality of the job matches, accessibility of the external labour force. I also add a spatial match with the internal labour force, which is essentially a crossover between quality of the job matches and accessibility of the external labour force.

- Wage level in a firm is used as a proxy for the skill level it uses. Wage is seen as consisting of two components: compensation for personal productivity and sectoral and regional differentials. Thus wage level in the firm, when also controlling for the wage level in the region-sector combination, reflects the skill level the firm uses. This is in line with WfT literature: Michaels et al. (2001) indicate that generous monetary compensation is a necessary, albeit insufficient condition in attracting and retaining talent (p.12). Interestingly, based on the WfT argument it can be expected that the variation in wages at the higher end still does not fully reflect their productivity: the war for talent is waged exactly because the most highly skilled create disproportionately more value relative to their pay.

Thus the skill level is operationalised as the mean daily wage (IHS, weighted, adjusted for inflation and workload, WAGE).

- I suggest that jobs stability reflects the quality of job matches: it signals both a firm's and employees' satisfaction with the job match, importance of continuity and high

levels of firm-specific human capital involved as both the firm and the employees rate the current job match higher than all available alternatives. The association between building up competitive advantage through people and employment stability has also been stressed by the CAAtP literature (Pfeffer 1998, 94-98). Mean employees' organisational tenure in the firm and employment turnover are chosen as the main indicators of good labour matches. They both have similar interpretation; however employment turnover is more dependent on a short-term trend while mean organisational tenure reflects a long history and has more inertia. I suggest that the aggregate measures reflect the dominant strategy of the firm; while much of the literature above suggests that firms also differentiate among individual employees (Lepak and Snell, 1999, Looise et al., 1998) a firm has limited abilities to do so dealing with an event such as long-distance relocation.

Thus employment turnover and mean employees' organisational tenure (IHS, weighted, TURNOVER, TENURE) are used as proxies for the quality of job matches. The turnover is calculated as the ratio between the sum of inflows and outflows in a year and the average number of employees in that year, weighted by workload.

- The labour force accessibility is operationalised as the ability to hire employees close to the firm. The labour pooling research indicates that geographical distance is crucial in hiring: possibly, the nearby applicants are more likely to be found via firm's network and thus better information can be obtained about them prior to the hiring. They can be hired on a shorter notice and possess more local knowledge. I intend to capture other factors of influence to the hiring distance, such as the specialization and scarcity of the skill required by the vacancy, by the wage and firm employment growth variables.

The variable used for labour force accessibility is mean hiring distance throughout the year for the employees that stayed in a firm for at least thirty calendar days (IHS, weighted, HIRINGDIST).

- Finally, mean distance to all employees is included to reflect the spatial match with the internal labour force. Firms value good spatial matches with their employees for a number of reasons: it has been shown that the commuting costs are partially compensated by the employer (Rupert et al., 2009, Mulalic et al., 2010, van Ommeren and Rietveld, 2007), employees with short commutes are perceived as more productive and more motivated (Hanson and Pratt, 1992). Short distances to the

employees indicate that a spatial match has been achieved and that a long-distance relocation is likely to affect it negatively.

Thus the spatial match with the internal labour force is operationalised as the mean commuting distance of all employees employed in the firm at the time of reference (IHS, weighted, ALLDIST).

In addition, I control for several firm-level and region-level variables that have been shown to play a role in firms' relocation decisions:

- Firm employment size, in FTEs (SIZE). Small firms are known to be more mobile as found by Kronenberg (2013), Brouwer et al. (2004), van Dijk and Pellenbarg (2000), Weterings and Knoben (2013), see Brouwer et al. (2004) for a more extensive explanation.
- Employment growth dummies indicating whether the positive or the negative employment growth in FTEs in the firm exceeded five percent (POSGROWTH and NEGGROWTH). Positive growth presents firms with different locational requirements: new premises might be sought, but also new production outlets, labour markets and suppliers. The previous findings on the effects of negative growth on relocation are conflicting: compare e.g. Kronenberg (2013) and Brouwer et al. (2004).
- The longest organisational tenure (TENUREMAX). Old firms are more embedded in the local environment and thus less willing to relocate (Brouwer et al. 2004). Since reliable data on the age of firms is not available to me, the longest organisational tenure is used as a proxy for the firm age.
- Average workload per job, in FTEs (WORKLOAD). How complicated a long-distance relocation is, relates not only to the magnitude of work performed in the old location, as measured in FTEs, but also to the number of job relationships in the old location. This variable addresses the relationship between the FTEs and jobs.
- Sector dummies. Six broad sectors are distinguished: manufacturing (NACE rev.2 section C, MANUF), utilities and construction (sections D, E, F, UTILCON), wholesale (groups 45 and 46 in section G, WHOLESale), retail (group 47 in section G, RETAIL), knowledge-intensive services (sections J, K and M, KNOWLSERV), other services (sections H, I, L, N, S, OTHERSERV).
- Dummy variable to indicate whether a firm had inflows in a certain year (NOINFLOWS). While for some firms the mean hiring distance cannot be computed

as the firm has not done any hiring in that specific year (that is, the missingness occurs not because the values are unknown but because they genuinely do not exist), the missing values are replaced with series mean and a dummy is created to capture this effect.

- Home region variables: sectoral variety (measured as Herfindahl-Hirschman index at two digit level of NACE rev.2, HHI), location quotient of the sector that the firm is in (LQ), working age population density (POPDENS). These variables are intended to capture the nature of job transitions and business environment in a broad sense in the local labour market. Working age population density and location quotient also reflect the density of the labour market, providing more opportunities for both labour pooling and labour poaching.
- Mean wage in region-sector combination (IHS, weighted, adjusted for inflation and workload, WAGEREGSEC). As Kronenberg (2013) notes, next to skill level, wages paid in a firm could also depend on regional differentials. In this case, paying a higher wage would be an incentive to move to cheaper labour force region rather than a keep factor. Therefore the local wage level is added as a control variable to ensure that the wage level in the firm reflects primarily the skill level of the employees.

In an alternative specification also the education level of the employees is included. The interpretation of wage partially also depends on whether one adopts the WfT approach ('skills are general and easily transferable between jobs' or the CAfP approach ('skill can be to a large extent firm-specific')). If skills are to a great extent firm-specific, wage might reflect job match quality rather than the objective value of the skills. Besides, using a different indicator of skill level also relates to the discussion on what really matters to the firms: the absolute levels of human capital (reflected by education) or the relative advantage (reflected by wages, see Brown (2003)). The education level is operationalised as the share of employees with academic or higher vocational education (EDUC, weighted). A shortcoming is that the education level is available only to 48.7% of the employees of the selected firms, the availability is biased towards recent graduates. Therefore in many cases the education level is missing, also in many instances it is based on the data of only a fraction of the employees.

Secondly, OLS regressions are conducted with dimensions of human capital in the firm as the dependent variables to analyse the effect of relocation. Dummy variables are used to indicate whether the firm has relocated in the timespan analysed and whether the firm-year record

comes from post-relocation period. In such a way, it is similar to difference-in-differences approach but is simplified due to not being able to define the post-treatment effect for the non-relocated firms. Again, to eliminate the short-term turbulence around the relocation, the firm-year records from the first year before the relocation, year of relocation and the first year after the relocation are removed.

In the OLS analyses the dependent variables are wage level, turnover and hiring distance. Additionally the following variables are used:

- Dummy variable indicating a record of a firm that has relocated in the timespan analysed (RELFIRM).
- Dummy variable indicating a record in the post-relocation period (AFTERREL).

5. Results

5.1. Descriptive statistics

In order to explore what role human capital plays in firms' long-distance relocations decisions, in this section I show how different dimensions of human capital compare in firms before and after relocation as well as in non-relocating firms (see Table 2A in the Appendix for a more detailed overview).

Long-distance relocation is an infrequent event. While 1.57% of firm-year records indicate a municipality change, only 19.6% of those moves cover distance greater than 30km, measured between the centres of municipalities. Long-distance relocations result in considerable changes in staffing. As shown in Figure 1, the employment growth is high in firms before relocation but slows down after the relocation¹. However, the modest employment growth is achieved by having substantial inflows of employees hired in the new location, as the employees who did not join the relocation need to be replaced.²

As far the quality of job matches is concerned, relocation does not result in qualitatively different job relationships. Long-term relocation has a dramatic short-term effect on

¹ As the lower limit for employment growth is -1 but there is no upper limit, there are many positive outliers that influence the results. If they are excluded the employment growth follows a downward trend more consistently without the peak around relocation.

² The conclusions also do not change if only the firms are included that could be followed throughout the whole timespan presented here, except that the trend in the employment turnover is less clearly pronounced.

employment turnover, but employment turnover in the second year after the relocation is only marginally lower than the employment turnover in the second year before the relocation and is at similar level with the employment turnover of non-relocating firms (Figure 1).

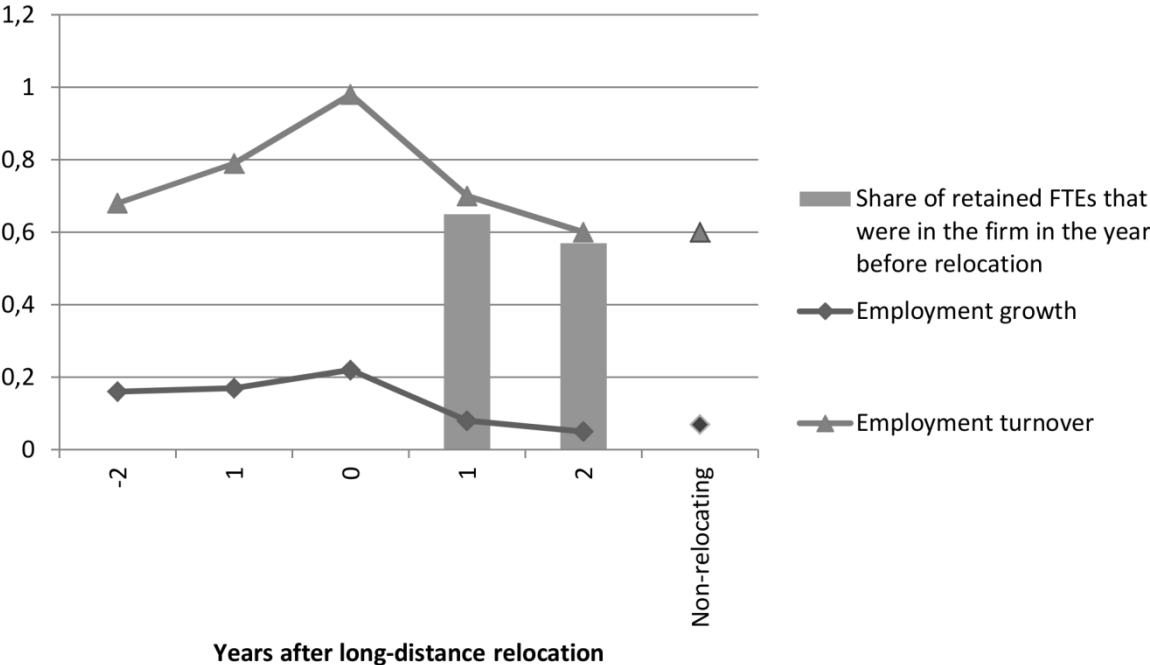


Figure 1. Comparison of job dynamics in relocating and non-relocating firms.

Changes in spatial relationships with the employees are relatively small but in the expected direction. Relocation has substantial short-term effects: the distance to new inflows as well as the distance to all employees peak in the first year before the relocation and gradually decrease afterwards. However, Figure 2 is suggestive of the distance to new inflows and the distance to all employees being lower after the relocation than before the relocation, also when the short-term turbulence wears off. It must be noted that the distance to new inflows and the distance to all employees always remain higher than that of non-relocated firms by a very large margin. This can indicate relocating firms are very inefficient hirers or they are much less sensitive to distance to employees than an average firm. Possibly, the jobs in these firms require employees to routinely be in locations other than the location of the employer or perhaps teleworking is widespread.

In addition, the long-distance relocations are less disruptive to the spatial relationship with the employees than it could be expected due to mutual adjustments by the firm and the employees. The employees that stay in the firm do not experience increase in commuting

distances (Figure 2) due to several factors. Firstly, large initial distances to the employees enable relocating firms to make relatively long moves with only moderate modifications in the distance to the employees. The weighted mean distance between a relocating firm and its employees is 41.2 km before the relocation, the weighted mean distance between the pre-relocation residential locations of the same employees and the post-relocation location of the firm is 45.5 km, introducing only a modest increase. In addition, this distance is 42.3 km for the employees that stay in the firm in the year after relocation and 40.0 km for the employees that stay in the firm in the second year after the relocation. This suggests that there is also a selection of employees staying in the firm depending on their new commuting distances. Alternatively, it could be that the firms primarily adjust their location to the locations of the most important core employees that the firm is willing to retain in the long term. Lastly, the employees of relocating firms also adjust their residential location to the new location of the firm: they change the municipality more often than the employees of non-relocating firms, predominantly in the year of the relocation, but the residential move rates remain slightly higher also before and after the relocation.

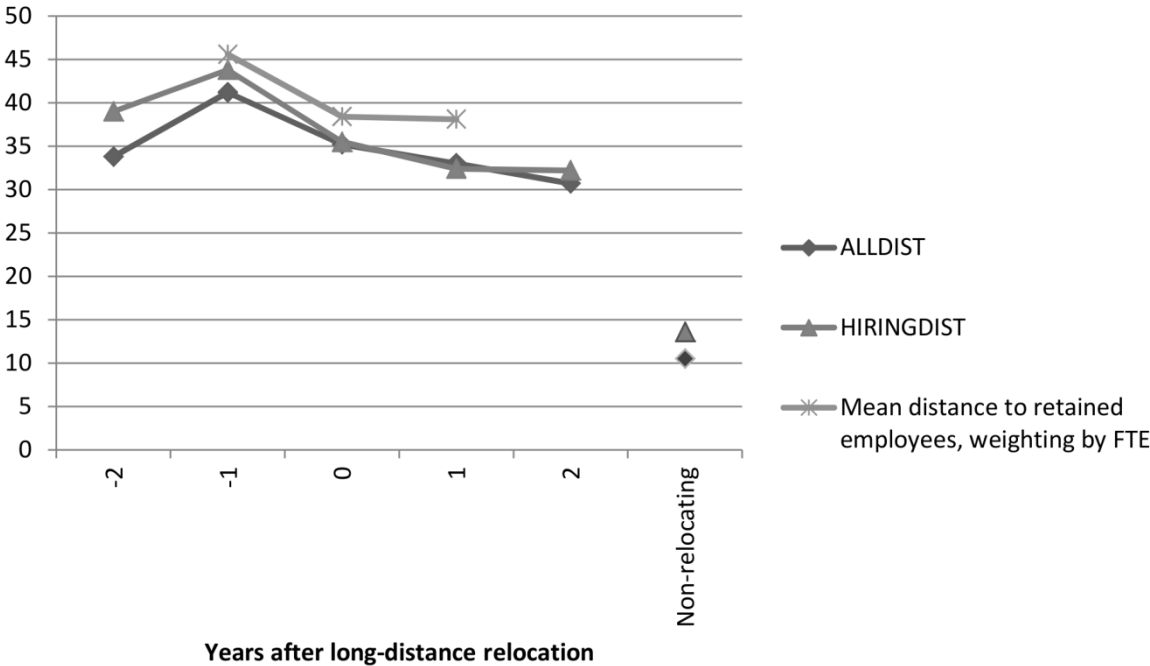


Figure 2. Comparison of distance to employees in relocating and non-relocating firms.

Relocating firms use highly-skilled employees, as measured by the wage level, but the skill level is not upgraded by means of relocation. The higher wages in relocating firms are partially explained by them being in high wages paying region-sector combinations. Contrary

to neoclassical theory those firms do not tend to move to cheap labour force regions. Relocating firms retain the employees that on average earn slightly more than the other employees before relocation, yet in general the after-relocation wages remain at the same level as before the relocation (Figure 3).

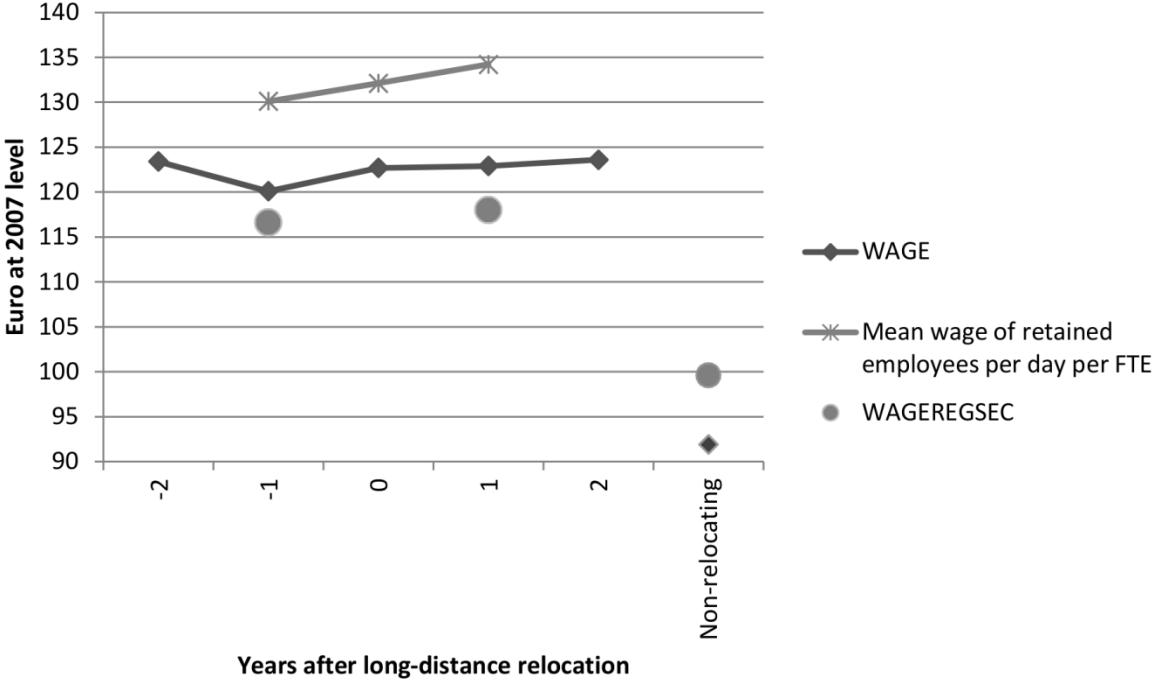


Figure 3. Comparison of wages in relocating and non-relocating firms.

5.2. Human capital as a keep factor

5.2.1. Results

The descriptive analysis suggests that long-distance firm relocation is a solution to suboptimal spatial matches with the employees. No evidence is found that the firms are attracted to good labour matches or high skill levels. In this section, those findings are assessed by means of logistic regression, also controlling for a number of firm, region and sector characteristics.

Firstly, I check whether looking into dimensions of human capital forms a meaningful addition to understanding firm relocation. In regression (1) I include all variables described in section 4.2, except the human capital variables. They correspond to a great extent to variables typically used in firm relocation research. In regression (2) also the human capital variables are included. Human capital variables- added either individually or all together- considerably

improve the model. Pseudo R squared still is still quite low, but this is typical of firm relocation research (compare with Kronenberg (2013)).

Low mean organisational tenure is associated with higher firm's propensity for long-term relocation, thus, as H2a predicts, good job matches with the internal employees make a firm less willing to relocate. This is in line with the CA_TP view. However, the same is not observed for employment turnover, which probably has to do with two years lag in the independent variables and the employment turnover being more sensitive to short term fluctuations than mean employees' organisational tenure. Lower mean hiring distance is related to a lower propensity to relocate: as H3a predicts, the ability to easily draw human resources from the local labour pool decreases firms' propensity to relocate, controlling for wage level and firm employment growth. Also high mean employees' commuting distance is associated with higher long-term relocation risk: in accordance to H4a, good spatial matches deters firms from long-distance relocation.

However, in contradiction to H1a and the WfT view, firms paying high wages are more likely to exit the region. It is possible that high wages signal a successful firm that is likely to be looking for new production markets, premises, suppliers etc. In any case, this finding suggests that the firms' rootedness is driven primarily by the quality of the labour matches, rather than the quality of the employees themselves. This is in line with resource-based view of a firm, suggesting that the value of the employees to the firm stems from the synergies and unique interactions rather than the market value of the employees' skills (Pfeffer, 2001).

Most of the other variables become statistically non-significant at 0.05 level, when human capital variables are included. This suggests that human capital plays a crucial role in firm relocation and it is important to include aspects of human capital in modelling firms' relocation decisions. One exception is sectoral variety: in line with nursery city model predictions (Duranton and Puga, 2001), firms are more likely to leave sectorally diverse regions.

Table 1. The effects of different aspects of human capital on firm's propensity for long-distance relocation

Dep. var.=long distance relocation				
	(1)		(2)	
	B	Odds ratio	B	Odds ratio
Human capital variables				
WAGE			0.7093*** (0.1148)	2.0326*** (0.2333)
TURNOVER			0.2062 (0.1279)	1.2291 (0.1572)
TENURE			-0.6485*** (0.1429)	0.5228*** (0.0747)
HIRINGDIST			0.0611*** (0.0175)	1.0630*** (0.0186)
ALLDIST			0.2224*** (0.0172)	1.2491*** (0.0215)
Firm level control variables				
NOINFLOWS			0.5210*** (0.1424)	1.6837*** (0.2397)
SIZE	0.0001 (0.0027)	1.0001 (0.0027)	-0.0068* (0.0037)	0.9933* (0.0033)
POSGROWTH	0.3068** (0.1053)	1.3590** (0.1431)	0.0658 (0.1179)	1.0680 (0.1259)
NEGGROWTH	0.3895*** (0.1106)	1.4762*** (0.1633)	0.1901* (0.1133)	1.2095* (0.1371)
TENUREMAX	-0.0400*** (0.0068)	0.9608*** (0.0067)	0.0032 (0.0094)	1.0032 (0.0094)
WORKLOAD	1.4892*** (0.2606)	4.4334*** (0.1553)	0.3518 (0.2602)	1.4217 (0.3700)
Sector and region control variables				
Sector: UTILCON (MANUF being the reference category)	-0.4368* (0.2430)	0.6461* (0.1570)	-0.3303 (0.2427)	0.7187 (0.1745)
Sector: WHOLESALE	0.5461** (0.1836)	1.7265** (0.3170)	0.2852 (0.1835)	1.3300 (0.2440)
Sector: RETAIL	0.8271*** (0.2431)	2.2867*** (0.5559)	0.5926** (0.2431)	1.8086** (0.4397)
Sector: OTHERSERV	0.6347*** (0.1823)	1.8865*** (0.3628)	0.3805** (0.1927)	1.4630** (0.2819)
Sector: KNOWLSERV	0.5148** (0.1854)	1.6733** (0.3103)	0.2858 (0.1851)	1.3309 (0.2463)
HHI	9.8591 (6.6510)	19132.35 (127248.5)	14.3300** (6.7569)	1672696** (1.13e+07)
LQ	-0.0155 (0.0406)	0.9847 (0.0399)	-0.0354 (0.0394)	0.9652 (0.0380)
POPDENS	-0.0002 (0.0001)	0.9998 (0.0001)	-0.0002* (0.0001)	0.99998* (0.0001)
WAGEREGSEC	1.7902*** (0.2608)	5.9906*** (1.5622)	0.7694** (0.2842)	2.1585** (0.6135)
N	297149		297149	
Mc Fadden's pseudo R squared	0.0332		0.0863	
Log likelihood	-3973.886		-3755.606	
BIC	8136.802		7775.853	

Note: standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. The explanatory variables are lagged two years with regard to the dependent variable.

To conclude, good quality of labour matches, good access to external labour force and good spatial match with the internal labour force deters firms from exiting the region. Skill level of the employees, however, motivates rather than deters firm long-distance relocation. Firms are kept put primarily by their culture and human resource practices as well as by dependence on the local labour markets.

5.2.2. Robustness checks

Several robustness checks are performed (see Table 6A in the Appendix for detailed results). Firstly, the model is fitted using complementary log log rather than a logistic function. Complementary log log is often recommended if negative outcomes are very common compared to the positive outcomes in the data or the other way round, yet here it produces results similar to those of the logistic regression.

Secondly, the regression is performed with a different indicator of skill level of the employees, namely the share of highly educated employees in a firm. As explained in section 4.2, the interpretation of the wage variable depends also on what approach one adopts on how general human capital is and to what extent the absolute levels of human capital matter compared to the relative advantage in human capital. Thus education levels capture slightly different aspects of human capital. However, I obtain similar results also using the education level.

Also if the independent variables are lagged three years with regard to the dependent variable, the results remain robust, except the mean hiring distance. Due to considerable overlap between mean hiring distance and mean distance to all employees, mean hiring distance is statistically significant only if distance to all employees is excluded.

5.3. Human capital as a pull factor

5.3.1. Results

The previous section shows that lower quality of labour matches and suboptimal spatial matches with both internal and external labour force are associated with higher propensity to relocate. To see whether the keep and pull effects are symmetrical, in this section I examine to what extent the relocation results in improvements in the quality of labour matches and spatial matches with the employees.

The effects of relocation on the firm's relations with its human capital are further explored using OLS regression. Mean hiring distance, employment turnover and mean wage are used as the dependent variables. Dummy variables are included to indicate whether the firm has relocated in the timespan analysed and whether the firm-year record comes from post-relocation period of relocated firms. This allows me to compare both non-relocating firms (reference category) with relocating firms and relocating firms before and after relocation. Firm records from the first year before the relocation to the first year after the relocation are excluded in order to eliminate the effects of short-term turbulence around the relocation.

As Table 2 shows, the relocating firms pay higher wages but there is no evidence that the wage level is affected by the relocation itself; this does not conform to H1b predicting that relocation is instrumental in upgrading the skill base. The same applies to employment turnover: generally, relocating firms have less stable job relationships and relocation does not make them more stable. Again, the evidence is against H2b proposing that the firms use relocation to be able to have better quality job matches.

Table 2. Effects of firm relocation on mean hiring distance, employment turnover and mean wage

	Dep. var.=WAGE	Dep. var.=TURNOVER	Dep. var.=HIRINGDIST
Firm level variables			
SIZE	-0.0001*** (0.00001)	0.0015*** (0.00001)	0.0094*** (0.0007)
POSGROWTH	-0.1057*** (0.0011)	0.2751*** (0.0013)	0.1029*** (0.0160)
NEGGROWTH	-0.0486*** (0.0011)	0.2366*** (0.0013)	0.0441** (0.0181)
TENUREMAX	0.0059*** (0.0001)	-0.0113*** (0.0001)	-0.0136*** (0.0011)
WAGE		-0.2650*** (0.0020)	1.6022*** (0.0221)
WORKLOAD	0.4463*** (0.0029)	-0.0560*** (0.0037)	3.1354*** (0.0394)
TURNOVER			0.7623*** (0.0154)
Sector and region variables			
Sector: UCON (MANUF being the reference category)	0.0401*** (0.0016)	0.0271*** (0.0021)	-0.7186*** (0.0284)
Sector: WHOLESALE	0.0625*** (0.0016)	0.0197*** (0.0019)	0.3919*** (0.0249)
Sector: RETAIL	0.0941*** (0.0020)	-0.0958*** (0.0025)	0.2404*** (0.0294)
Sector: OTHERSERV	0.0962*** (0.0017)	0.0871*** (0.0021)	0.3207*** (0.0257)
Sector: KNOWLSERV	0.0961*** (0.0018)	0.0703*** (0.0021)	0.5720*** (0.0255)
LQ	-0.0035*** (0.0005)	0.0097*** (0.0006)	0.0374*** (0.0055)
POPDENS	-0.00001*** (0.0000)	0.00006*** (0.00000)	-0.0002*** (0.00001)
WAGEREGSEC	0.7987*** (0.0028)	-0.0494*** (0.0039)	1.6022*** (0.0221)
Relocation variables			
RELFIRM	0.0975*** (0.0136)	0.0741*** (0.0143)	1.9022*** (0.1464)
AFTERREL	0.0047 (0.0167)	0.0006 (0.0172)	-0.5290** (0.1834)
2nd year after rel.	0.0028 (0.0189)	0.00003 (0.0193)	-0.4370** (0.2062)
3rd year after rel.	-0.0024 (0.0217)	0.0119 (0.0152)	-0.5606** (0.2479)
4th year after rel.	0.0291 (0.0288)	-0.0244 (0.0292)	-0.8155** (0.3434)
Year dummies	+	+	+
N	590055	590055	410679
R squared	0.4558	0.2414	0.1276

Note: robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

However, the results in Table 2 indicate that relocation is associated with an increased access to employees, which confirms H3b. While relocating firms in general hire their employees

further away, after the relocation the hiring distances stably decrease, though they consistently remain higher than those of non-relocating firms.

In conclusion, the findings indicate that access to labour force does act as a pull factor. The relocated firms improve their access to labour force, though they still do not reach the level of non-relocated firms. This suggests that the relocating firms have idiosyncratic hiring needs, making them more footloose. The findings do not support the role of skill level and quality of job matches as pull factors.

5.3.2. Robustness checks

Several robustness checks are performed (see Table 7A in the Appendix for detailed results). First, in the analysis in section 5.3.1 I have excluded the records from the first year before the relocation to the first year after the relocation in order to eliminate the influence of short-term turbulence around the relocation. Since the relocation-related peak in hiring distance is earlier than the peak for other variables (Figure 2), here I check whether this choice was meaningful. I identify the short term adjustment period, just as in Table 2 but with several control variables included. As Figure 4 shows, there is a well-pronounced peak around the first year before the relocation, but overall there is a downward trend, as found in the OLS analysis in section 5.3.1 (all the coefficients are statistically significant at 0.001 level). However, Figure 4 indicates that in order to eliminate the influence of the short-term peak in analysing the changes in mean hiring distance, it is the best to compare the firms after the relocation to firms in the third and fourth year before the relocation. To address this, I conduct a regression just as shown in Table 2, but with records removed from the second year before the relocation to the first year after the relocation. After this, the variables indicating whether the record comes from after the relocation become statistically non-significant, which suggests that there is no genuine change in hiring distance related to long-distance relocation.



Figure 4. The effects of long-distance relocation on mean hiring distance. The reference category is non-relocated firms. The coefficients are taken from a regression that is the same as the one presented in Table 2, except for the relocation variables.

The regression on mean hiring distance is only performed on the firms that have hired in a certain year. If the firms that cannot find good matches in the proximity do not hire and if the relocation provides the firms with better hiring opportunities, it is possible that OLS underestimates the effects of relocation. To check this, Heckman correction has been conducted with the following selection variables: firm size, working age population density, sector, year and relocation variables. Heckman estimation is conducted on the dataset with records removed from the second year before the relocation to the first year after the relocation. Heckman estimation does detect the bias in OLS estimates, but the post-relocation variable is statistically non-significant in the selection regression. The coefficients and significance levels of the main variables of interest after Heckman correction are very similar.

Thirdly, while the wage in a region-sector combination is calculated for fairly large combinations of broadly defined region (NUTS3 area) and sector (2-digit level of NACE rev.2), it is still possible that some big firms dominate region-sector combinations, thus making the wage in a region-sector a very good predictor of the wage in the firm. However, the findings are robust to the exclusion of wage in region-sector.

Thus the keep-effects pertaining to access to employees found in section 5.3.1. are influenced by short-term turbulence around the relocation due to mutual firms' and employees' adjustments. When this is corrected, the post-relocation effects become statistically non-significant.

6. Conclusions

This paper examines to what extent human capital influences firms' long-distance relocation decisions. Three dimensions of human capital that emerge from the literature as valued by the firms are discussed and their effects on firm long-distance mobility are tested.

I demonstrate that human capital variables are crucial in explaining firm relocation. Firms show a strong attachment to their employees and retaining the labour force is an important consideration of relocating firms. Long-distance relocations are infrequent and they happen predominantly among firms that have very long commuting and hiring distances already before the relocation, indicating low dependence on the local labour markets. In addition, long initial commuting distances enable the firms to have long moves with little increase to the employees' commutes.

I also show that skill level does function neither as a keep factor nor as a pull factor. While based on, for instance, Florida (2002) it could be expected that the spatial differentials in skill level inflict response in firms' spatial behaviour, having highly skilled employees does not deter firms from exiting the region and relocation does not result in skill upgrading. There can be several explanations for this. First, it is possible that the exceptional position in the labour market of the highly skilled is overrated. While there is little doubt about the growing demand for skills, the scarcity of skills is still very much debated. Second, even if the war for talent is real, it is not clear how prevalent its manifestations are. Talent in the traditional sense of the word defines a rare, exceptional ability, possessed only by a minority, and this becomes even clearer if the discussion is framed in terms of firm's competitive advantage in the global world.

Third, I would like to point out that the concept of war for talent is based on an assumption that the skill level is not completely reflected in the wage level. This contradicts the neoclassical wage theory and ignores the issue of sustainability of comparative advantage. If talent is crucial for firm's success it is difficult to imagine that firms would refrain from employee poaching. Provided that talent is easily transferred between jobs and employees

respond to monetary incentives, it can be expected that the firms bid for talents until the talented employees' contribution to the competitive edge of the firm is offset by the costs that the firm would experience in attracting and retaining them, undermining the motivation for competition. And finally, while most of emphasis on talent stems from the U.S.A. context, the value attached to talent is also strongly affected by cultural and institutional factors, as evident from great differences in wage inequality across countries, which cannot be explained solely by differences in the levels of human capital.

The quality of job matches affects the firm's relocation decisions, but only as a keep factor. Since I take the stability of job relationships as a proxy for quality of job matches, the results essentially show that firms that have been reluctant to break job relationships in other contexts, are also reluctant to risk breaking them because of relocation. This suggests that beauty is also in the eye of the beholder: how much human capital is valued depends greatly also on the culture and policies of the firm rather than the skill level of the employees. Furthermore, while the firms with worse labour matches are more prone to relocate, the relocation does not result in better job matches. I interpret this finding as showing that the quality of the job matches depend mostly on firm's culture and policies rather than on the characteristics of the available labour force. In addition, the relationship with the employees could be seen as a certain investment and a form of rootedness from the firm's perspective. Therefore it cannot effectively function as a pull factor and it cannot be well estimated before the relocation.

Access to employees functions also functions only as a keep factor. Relocating firms hire their employees from much further away than non-relocating firms, indicating their independence from the local labour market, local knowledge and networks. Relocation fails to statistically significantly shorten the hiring distances. This suggests that, as in the case of the quality of job matches, their different hiring practices are to a great extent determined by different firms' needs rather than different labour markets. Possibly, the hiring distances depend also on the knowledge of the local market and participation in local networks, which explains why the newcomers are less efficient.

To conclude, it seems that in the case of firm relocation human capital differentials do not contribute to redistribution of employment; rather it is one of the forces that maintain the present job distribution. Firms are rooted due to the human capital they have; they tend not to search opportunistically for greener pastures. Skill level of the employees has no bearing on

this rootedness, rather it is determined by the culture and human resource practices of the firm itself as well as by its dependence on the local labour markets. I argue that in understanding how human capital creates value more attention should be paid not only to cognitive/physical/other abilities of an individual, but also the context-specific possible uses for them. While the world is certainly becoming more global, there are still local niches to be exploited; local knowledge and local networks are of importance. People may be easily replaceable in increasingly flexible labour markets. However, teamwork amounts to more than the sum of individual performance, or at least it is perceived as such.

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Appendix

Table 1A. Sectors excluded from the analyses

NACE rev 2. sector code	NACE rev 2. Code sector title
A	<i>Agriculture, Forestry and Fishing</i>
B	<i>Mining and Quarrying</i>
78 in N	<i>Employment Activities</i>
O	<i>Public Administration and Defence, Compulsory Social Security</i>
P	<i>Education</i>
Q	<i>Human Health and Social Work Activities</i>
R	<i>Arts, Entertainment and Recreation</i>
T	<i>Activities of Households as Employers; Undifferentiated Goods- and Services-producing Activities of Households for own use</i>
U	<i>Activities of Extraterritorial Organisations and Bodies</i>

Table 2A. Summary of relocating firm's characteristics in time

	2 years before relocation		1 year before relocation		Year of relocation		1 year after relocation		2 years after relocation		Non-relocated	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Employment dynamics												
Employment growth (in FTEs)	0.16	0.71	0.17	0.86	0.22	0.96	0.08	0.46	0.05	0.34	0.07	0.99
TURNOVER	0.68	0.76	0.79	0.91	0.98	1.96	0.70	0.77	0.60	0.69	0.60	0.97
Share of retained FTEs that were in the firm in the year before relocation							0.65	0.31	0.57	0.31		
Access to employees												
ALLDIST	33.8	27.7	41.2	30.8	35.2	29.9	33.0	27.3	30.7	25.7	10.5	13.9
HIRINGDIST	39.0	33.8	43.8	36.6	35.5	34.2	32.4	32.6	32.2	31.0	13.6	20.0
Mean distance to retained employees, weighting by FTE			45.6	33.7	38.4	32.8	38.1	32.8				
Employees' skill level												
WAGE	123.4	108.7	120.1	67.8	122.7	96.4	122.9	72.1	123.6	71.5	91.9	69.6
Mean wage of retained employees per day per FTE			130.1	100.3	132.1	69.8	134.2	76.0				
WAGEREGSEC			116.6	32.8			118.0	31.0			99.6	31.0
Sector												
MANUF=1, %					6.5							10.5
UTILCON=1, %					5.4							10.0
%					22.4							17.0
RETAIL=1, %					8.8							16.6
OTHERSERV=1, %					18.5							26.2
KNOWLSERV=1, %					38.4							19.6
N	566		1086		1830		1284		907			587493

Note: All the variables are computed as described in section 4.2, but the inverse hyperbolic sine transformations are not applied in this table for a more straightforward interpretation. For some variables N is lower than shown.

Table 3A. Descriptive statistics of continuous variables

Continuous variable	N	Mean	Standard deviation	Minimum	Maximum
TURNOVER	594269	0.61	0.98	0.00	212.78
TENURE	594269	5.7	3.5	0.1	39.6
HIRINGDIST	594269	13.9	20.3	0.0	307.9
WAGE ³	594269	92.3	69.9	0.1	17794.0
EDUC	413759	0.19	0.30	0.00	1.00
SIZE	594269	9.2	21.6	0.0	2675.2
ALLDIST	594269	10.8	14.4	0.0	272.1
TENUREMAX	594269	12.5	7.9	1.0	61.2
WORKLOAD	594269	0.74	0.22	0.00	1.00
HHI	594269	0.042	0.007	0.034	0.072
LQ	594269	1.13	1.00	0.00	48.13
POPDENS	594269	567.6	450.7	92.7	2199.3
WAGEREGSEC	594269	99.8	31.1	38.3	531.6

Note: All the variables are computed as described in section 4.2, but the inverse hyperbolic sine transformations are not applied in this table for a more straightforward interpretation

Table 4A. Descriptive statistics of dummy variables

Dummy variable	Dummy variable=1, %
NOINFLOWS	30.38
POSGROWTH	35.64
NEGGROWTH	30.99
Sector: MANUF	10.49
Sector: UTILCON (MANUF being the reference category)	10.00
Sector: WHOLESALE	17.06
Sector: RETAIL	16.54
Sector: OTHERSERV	26.10
Sector: KNOWLSERV	19.81

³ The findings for wages remain robust also when the outliers are removed when calculating WAGE and WAGEREGSEC

Table 5A. Correlation table of independent continuous variables

	TUR NOV ER	TEN URE	HIRI NGD IST	WA GE	EDU C	SIZE	ALL DIST	TEN URE MAX	WOR KLO AD	HHI	LQ	POP DEN S	WA GER EGS EC
TURNOVE R	1.00												
TENURE	-0.62	1.00											
HIRINGDI ST	-0.02	-0.01	1.00										
WAGE	-0.32	0.30	0.29	1.00									
EDUC	-0.07	0.01	0.20	0.42	1.00								
SIZE	-0.04	0.07	0.11	0.13	0.07	1.00							
ALLDIST	0.06	-0.11	0.45	0.23	0.22	0.10	1.00						
TENUREM AX	-0.26	0.62	0.05	0.20	-0.01	0.36	-0.02	1.00					
WORKLO AD	-0.20	0.17	0.28	0.48	0.17	0.19	0.19	0.21	1.00				
HHI	0.00	0.01	-0.02	-0.03	-0.01	-0.02	-0.02	0.00	-0.01	1.00			
LQ	0.00	0.00	0.05	0.07	0.04	0.06	0.10	0.02	0.07	-0.05	1.00		
POPDENS	0.04	-0.04	0.03	0.09	0.11	-0.00	0.02	-0.03	0.05	0.44	0.02	1.00	
WAGERE GSEC	-0.18	0.14	0.28	0.63	0.38	0.13	0.21	0.11	0.48	-0.04	0.12	0.17	1.00

Table 6A. Robustness checks: propensity to relocate, as described in section 5.3

Dep. var.=long distance relocation				
	Main specification (as in Table 1)	Complementary log log	With alternative operationalisation of skill level	an independent variable lagged three years
	B	B	B	B
Human capital variables				
WAGE	0.7093*** (0.1148)	0.7037*** (0.1137)		0.6369*** (0.1793)
TURNOVER	0.2062 (0.1279)	0.2046 (0.1273)	0.0692 (0.1365)	0.2158 (0.1977)
TENURE	-0.6485*** (0.1429)	-0.6466*** (0.1425)	-0.7266*** (0.1610)	-0.6275** (0.2141)
HIRINGDIST	0.0611*** (0.0175)	0.0611*** (0.0175)	0.0566*** (0.0183)	0.0300 (0.0251)
ALLDIST	0.2224*** (0.0172)	0.2222*** (0.0172)	0.2504*** (0.0197)	0.2157*** (0.0255)
EDUC			0.8158*** (0.1360)	
Firm level control variables				
INFLOWS	0.5210*** (0.1424)	0.5195*** (0.1421)	0.4923*** (0.1522)	0.4771** (0.2156)
SIZE	-0.0068* (0.0037)	-0.0067* (0.0037)	-0.0061* (0.0036)	-0.0055 (0.0049)
POSGROWTH	0.0658 (0.1179)	0.0657 (0.1176)	0.1211 (0.1258)	-0.2034 (0.1700)
NEGGROWTH	0.1901* (0.1133)	0.1898* (0.1130)	0.3103** (0.1235)	-0.1542 (0.1748)
TENUREMAX	0.0032 (0.0094)	0.0032** (0.0094)	0.0084 (0.0098)	0.0078 (0.0141)
WORKLOAD	0.3518 (0.2602)	0.3565 (0.2590)	0.7213** (0.2763)	0.5073 (0.4056)
Sector and region control variables				
Sector: UTILCON (MANUF being the reference category)	-0.3303 (0.2427)	-0.3289 (0.2424)	-0.2504 (0.2558)	-0.3747 (0.3505)
Sector: WHOLESale	0.2852 (0.1835)	0.2849 (0.1831)	0.2442 (0.1904)	0.0304 (0.2705)
Sector: RETAIL	0.5926** (0.2431)	0.5912** (0.2427)	0.1944 (0.2222)	0.4498 (0.3606)
Sector: OTHERSERV	0.3805** (0.1927)	0.3805** (0.1823)	0.1292 (0.1958)	0.3258 (0.2783)
Sector: KNOWLSERV	0.2858 (0.1851)	0.2860 (0.1847)	0.2300 (0.1892)	0.2905 (0.2666)
HHI	14.3300** (6.7569)	14.2925** (6.7365)	2.3847 (7.2176)	19.1510 (10.5514)
LQ	-0.0354 (0.0394)	-0.0356 (0.0393)	-0.0129 (0.0334)	-0.0034 (0.0394)
POPDENS	-0.0002* (0.0001)	-0.0002* (0.0001)	-0.0001 (0.0001)	-0.0004** (0.0002)
WAGEREGSEC	0.7694** (0.2842)	0.7675** (0.2835)		0.8335** (0.4307)
N	297149	297149	263178	179638
Mc Fadden's pseudo R squared	0.0863	0.086	0.0861	0.0722

Note: standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. The explanatory variables are lagged two years with regard to the dependent variable.

Table 7A. Robustness checks: adjustments after the relocation, as described in section 5.4

	Dep. var.=WAGE		Dep. var.=HIRINGDIST		
	Main specification (as in table 2)	With WAGEREGSEC excluded	Main specification (as in Table 2)	With records in the second year before the relocation excluded	Heckman estimation (with records in the second year before the relocation excluded)
Firm level variables					
SIZE	-0.0001*** (0.00001)	0.0002*** (0.00002)	0.0094*** (0.0007)	0.0094*** (0.0007)	0.0079*** (0.0006)
POSGROWTH	-0.1057*** (0.0011)	-0.1145*** (0.0012)	0.1029*** (0.0160)	0.1022** (0.0160)	0.0923*** (0.0160)
NEGGROWTH	-0.0486*** (0.0011)	-0.0557*** (0.0012)	0.0441** (0.0181)	0.0433 (0.0181)	0.0599 (0.0181)
TENUREMAX	0.0059*** (0.0001)	0.0067*** (0.0001)	-0.0136*** (0.0011)	-0.0135*** (0.0011)	-0.0188*** (0.0010)
WAGE			1.6022*** (0.0221)	1.6034*** (0.0221)	1.5893*** (0.0416)
WORKLOAD	0.4463*** (0.0029)	0.6259*** (0.0030)	3.1354*** (0.0394)	3.1340*** (0.0395)	2.8580*** (0.0393)
TURNOVER			0.7623*** (0.0154)	0.7624*** (0.0154)	0.7983*** (0.0155)
Sector and region variables					
Sector: UCON (MANUF being the reference category)	0.0401*** (0.0016)	0.0865*** (0.0017)	-0.7186*** (0.0284)	-0.7199*** (0.0284)	-0.6930*** (0.0282)
Sector: WHOLESALE	0.0625*** (0.0016)	0.0828*** (0.0017)	0.3919*** (0.0249)	0.3927*** (0.0249)	0.4048*** (0.0247)
Sector: RETAIL	0.0941*** (0.0020)	-0.2048*** (0.0017)	0.2404*** (0.0294)	0.2406*** (0.0294)	0.2925*** (0.0293)
Sector: OTHERSERV	0.0962*** (0.0017)	-0.1091*** (0.0017)	0.3207*** (0.0257)	0.3209*** (0.0257)	0.2659*** (0.0259)
Sector: KNOWLSERV LQ	0.0961*** (0.0018)	0.2597*** (0.0017)	0.5720*** (0.0255)	0.5728*** (0.0255)	0.5244*** (0.0256)
POPDENS	-0.0035*** (0.0005)	-0.0156*** (0.0006)	0.0374*** (0.0055)	0.0375*** (0.0055)	0.0362*** (0.0055)
WAGEREGSEC	-0.00001*** (0.0000)	-0.0001*** (0.0000)	-0.0002*** (0.00001)	-0.0002*** (0.00001)	-0.0002*** (0.00001)
	0.7987*** (0.0028)		1.6022*** (0.0221)	1.2468*** (0.0407)	1.5092*** (0.0416)
Relocation variables					
RELFIRM	0.0975*** (0.0136)	0.1378*** (0.0143)	1.9022*** (0.1464)	1.6916*** (0.2386)	1.6772*** (0.2400)
AFTERREL	0.0047 (0.0167)	0.0126 (0.0174)	-0.5290** (0.1834)	-0.3188 (0.2630)	-0.3383 (0.2643)
2nd year after rel.	0.0028 (0.0189)	0.0099 (0.0198)	-0.4370** (0.2062)	-0.2267 (0.2794)	-0.2517 (0.2807)
3rd year after rel.	-0.0024 (0.0217)	0.0087 (0.0223)	-0.5606** (0.2479)	-0.3504 (0.3114)	-0.37080 (0.3127)
4th year after rel.	0.0291 (0.0288)	0.0324 (0.0291)	-0.8155** (0.3434)	-0.6054 (0.3917)	-0.6027 (0.3931)
Year dummies	+		+	+	+
					Heckman selection
Size: 2 to 4.99 FTEs (reference category being less than 2 FTEs)					0.5007*** (0.0048)
Size: 5 to 9.99 FTEs					1.2380*** (0.0059)
Size: 10 to 49.99 FTEs					1.9754*** (0.0075)

Size: 40 to 99.99 FTEs					2.9719*** (0.0433)
Size: more than 100 FTEs					3.1413*** (0.0800)
Sector: UCON (MANUF being the reference category)					-0.0694*** (0.0086)
Sector: WHOLESALE					0.0485*** (0.0077)
Sector: RETAIL					-0.0580*** (0.0091)
Sector: OTHERSERV					0.2954*** (0.0082)
Sector: KNOWLSERV					0.2845*** (0.0078)
POPDENS					0.0001*** (0.00000)
WAGEREGSEC					-1.0660*** (0.0108)
Year dummies					+
RELFIRM					0.1648** (0.0799)
AFTERREL					-0.0501 (0.0870)
rho					-0.1426*** (0.0043)
sigma					3.9891*** (0.0032)
N	590055	590055	410679	410266	589481 (410266 uncensored)
R squared	0.4558	0.3671	0.1276	0.1272	

Note: robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.