Employment Protection and Relocation with Firm Heterogeneity

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Abstract:

This paper examines the determinants of the decision to relocate activities abroad for firms that are located in 29 OECD countries. Our theoretical model suggests that firm heterogeneity plays a crucial role for the link between employment protection and relocation. Stricter employment protection laws in the home country discourages firms' relocation activity. While larger, more productive firms and firms with higher labour intensities have, ceteris paribus, higher propensities to relocate, these firms also face higher exit barriers if the country from which they consider relocating has strict employment protection laws. Our theoretical predictions are supported empirically, with consistent results for firms operating in the manufacturing sector.

1. Introduction

Discussions on the effects of firm flexibility remain –in spite of the vast literature on the topic– prominent, both in the academic literature and among policy makers. One factor that affects firm flexibility that has been discussed recently is the institutional environment, and more specifically, labour market regulations. Employment protection legislation (EPL) in particular is seen as an important source of firm inflexibility as it causes firms to incur adjustment costs in the form of redundancy payments whenever workers are laid off. It is well established that the firing costs implied by EPL lowers a firm's flexibility: when EPL is high, it is costly to fire workers and hence employment responses to shocks and/or the business cycle are smaller (see, for instance, Bertola and Rogerson, 1997; Garibaldi, 1998; Messina and Vallanti, 2007). Also, EPL gives firms an incentive to limit changes in output (see, for instance, Bertola *et al.*, 2010).

It is therefore not surprising that there exists a sizeable body of work studying the effect of EPL on a firm's decision to enter a market. This is particularly relevant for multinational enterprises (MNEs), which consider multiple host countries as potential production locations.[1] The empirical evidence provided by the literature generally shows that multinationals prefer locations with low levels of labour market regulation (Javorcik and Spatareanu, 2005, Olney, 2011). Work examining the link between employment protection legislation and foreign direct investment (FDI) presents evidence of the negative effect of employment protection on inward FDI (e.g., Nicoletti et al, 2003, and Görg, 2005). Hence, EPL is shown to act as a barrier to *entry* for international firms in

[1] Comprehensive reviews of the literature on determinants of FDI and multinational production are provided by Blonigen (2005) and Barba Navaretti and Venables (2004).

potential host countries. The advantage offered by flexible labour markets is clear: they allow multinationals to hire and fire easily, thus enabling them to adjust production easily to changes in economic conditions.[2]

What has been largely neglected in this literature is the fact that multinationals may not only care about the state of labour market regulations in the host, but also in the home country.[3] Our paper focuses on how firms are affected by labour market regulations at home and examines more specifically to what extent EPL acts as a barrier to relocation. In other words, we study the extent to which EPL is a barrier to *exit*. In the spirit of Stigler's (1968) definition of entry barriers, Geroski *et al.* (1990) define an exit barrier as a cost that a firm must bear in order to leave a market (not borne by firms that are not yet established in the market or by established firms that have not chosen to leave the market).

Although EPL as an institutional barrier to exit from a given location has received scant attention in the literature,[4] it matters in the real world for both firms and governments. If firms considering relocation are hindered in that decision by significant EPL-induced exit costs, their internationalisation strategy may be inhibited. At the same time, less or slower relocation resulting from strict EPL may be good news for governments of those countries with strict EPL: less firm relocation implies a lower burden in terms of the social adjustment cost potentially accompanying firm relocation.

[2] Examples of theoretical work that features the effect of employment protection on the location decision of firms are given by Haaland et al. (2002) , who discuss this issue for a monopolist firm, and Dewit *et al.* (2013), who focus on the interaction of firms' location decisions in an oligopolistic framework.

[3] As far as we are aware, Dewit *et al.* (2009) are one of the few studies that examine the potential role of employment protection legislation hindering outward FDI. Based on a theoretical model, they show that employment protection in the home country does indeed affect aggregate bilateral FDI flows between countries.

[4] From an empirical analysis based on online-survey data on national barriers to exit in general, Burmester (2011) suggests political and strategic exit barriers from the origin nation are significant inhibitors to relocation of FDI.

This is especially relevant in an era in which multinational firms have become increasingly footloose, leaving some countries with a rapidly eroding industrial base.[5] In fact, the debate on relocation remains intense on either side of the Atlantic, both among academics and policy makers.[6]

In examining to what extent EPL acts as a barrier to relocation, we pay particular attention to firm heterogeneity. Although EPL is *de jure* not industry specific, there is good reason to believe that industries are *de facto* not equally affected by a country's EPL. In fact, it is unlikely that firms in the same industry will be affected equally. Firm heterogeneity in relation to location decisions has received more attention in recent years, thanks to the increased availability of firm-level data-sets and a seminal paper by Helpman *et al.* (2004). We contribute to this literature by examining how employment protection changes the propensity to relocate of firms with different characteristics.[7] Relocation has been particularly relevant in manufacturing[8] and was –as suggested by survey data– mainly motivated by low labour costs abroad (European Commission, 2012).

[5] The literature offers several examples of government policy that has contributed to or has tried to prevent relocation by firms. For instance, Motta and Thisse (1994) investigate whether a strict environmental policy may cause firms to relocate, and Midelfart-Knarvik et al. (2002) examine how the EU's structural funds affect firm and industry relocation.

[6] See for instance –among numerous reports on relocation– the report commissioned by the European Parliament on the relocalisation of EU industry (2007) and the book by Bhagwati *et al.* (2009) discussing offhoring of American jobs.

[7] Examples of theoretical work on location decisions of heterogeneous firms are Baldwin and Okubo (2006) and Okubo et al. (2008). These papers analyse how heterogeneous firms self-select in different host countries. In an empirical study, Pennings and Sleuwaegen (2000) investigate the determinants of firm relocation for firms located in Belgium. Other empirical work includes Aw and Lee (2008) and Chen and Moore (2010), who study the location decisions of French and Taiwanese multinationals, respectively. None of these studies look at the effect of EPL in the home country on firms' relocation decisions.

[8] Cohen (2005) and Amiti and Wei (2005) point out that relocation in services is increasing but remains low. Blinder (2007), however, perceives the observed increase in relocation in services more as a threat to jobs in the source country.

With this in mind, we construct a simple theoretical framework modelling a firm's relocation decision. We first discuss a benchmark without employment protection and show that firms with different characteristics also differ in their propensity to relocate: larger, more productive and more labour-intensive firms have a higher propensity to relocate than their smaller, less productive and more capital-intensive counterparts. Second, we show that if there is employment protection in the source country of the multinational firm, its propensity to relocate falls. This reduction in its propensity to relocate is largest the larger, more productive or more labour-intensive the firm is. Hence, our model predicts that employment protection tends to make heterogeneous firms more similar in terms of their propensity to relocate.

We then test our theoretical predictions, using firm level data in 29 OECD countries for the period 1997-2007. We do this by merging an annual employment protection index with two firm-level datasets to identify firms that reduce their operations at home (via selling or closing/dissolving part of their company) and at the same time open up new foreign affiliates or acquire existing firms abroad. Our results are broadly in line with the theoretical predictions as outlined above, but only hold for firms in manufacturing, not in services. This seems to be in line with the observation that relocation in services, although increasing, is overall much lower than in manufacturing and heavily concentrated in a handful of service activities.[9]

In Section 2, we set up a theoretical framework that models the relocation decision of a firm and examines how specific firm-characteristics affect that decision. In

[9] Cohen (2005) points out that relocation in services remains marginal and predominantly applies to call centres and low-skilled jobs in IT-support. This is in line with case-study evidence reported in the European Restructuring Monitor Report (2007). Blinder (2007), however, perceives the observed increase in relocation in services as a potential threat to jobs in the source country.

Section 3, we present an empirical model that allows us to test our theoretical predictions. Section 4 reports our results and Section 5 concludes.

2. A simple theoretical model

Consider a monopolist firm, producing for an integrated market. There are two periods. In period one, the firm observes demand for that period, which is given by

$$p_1 = a - q_1, \tag{1}$$

but faces uncertainty about demand in period two, which is resolved at the start of period two. With probability ρ, demand in period two is the same as in period one:

$$p_2 = a - q_2. \tag{2a}$$

With the complementary probability $1-\rho$, a permanent positive demand shock occurs in period two[10], in which case period-two demand is:

$$p_2 = a - q_2 + \varepsilon. \tag{2b}$$

In expressions (1)-(2b), p_t denotes the price in period t ($t = 1,2$) and q_t stands for period-t output; in expression (2b) ε is the parameter that represents a permanent positive demand shock.

There are two possible production locations, countries 'Home' (*H*) and 'Foreign' (*F*). We assume that the firm's production location in period one is country *H* and that the fixed cost of setting up a plant in *H* has been sunk, hence there are no fixed cost to be

[10] It is straightforward to extend the model and include the possibility of negative demand shocks. However, since this does not alter the key message of the model, we have not included this possibility to keep the exposition as simple as possible (see the appendix in Dewit, Görg and Montagna (2009) for a related model with the possibility of a negative demand shock). There is some evidence that firms relocate less during downturns (see the European Commission's European Competitiveness Report 2012, p.62).

incurred in period one.[11] When uncertainty is resolved in period two, the firm chooses either to stay in country *H* or to relocate to country *F*. Its costs depend on the production location. If it does decide to produce in *F* in period two, it will incur a fixed cost of setting up a plant there (denoted by Φ). The firm uses two factors of production, labour (*l*) and capital (*k*). Respective wage rates in country *H* and *F* are w^H and w^F, while r^H and r^F are the rental rates of capital in the respective locations; these local factor prices are exogenously given to the firm. We assume that the *F*-country is relatively labour abundant, implying that labour in *F* is relatively cheap ($w^H / r^H > w^F / r^F$). The costs per unit of production in country *H* and *F*, c^H and c^F, are given by:

$$c^H = \alpha_l w^H + \alpha_k r^H \tag{3a}$$

and

$$c^F = \alpha_l w^F + \alpha_k r^F, \tag{3b}$$

respectively; parameters α_l and α_k stand for the unit factor requirements for labour and capital. These are assumed to be identical across countries but firm-specific, with their reciprocals denoting the marginal productivity of labour and capital within the firm.[12] Note that the firm's workforce in period *t* is $l_t = \alpha_l q_t$, whereas its capital is $k_t = \alpha_k q_t$, implying that its labour-capital rate is equal to α_l / α_k.

Apart from production costs, the firm incurs potential firing costs. More specifically, in country *H*, there is employment protection regulation. As a result, firms producing in *H* incur firing costs if they reduce the number of workers. Firing costs are

[11] The firm could either be a domestic firm of country *H* or a multinational that previously decided to locate there.
[12] The cost specification is based on a Leontief production technology.

represented by $I\lambda^H \alpha_l (q_1^H - q_2^H)$, where λ^H is a parameter that captures the degree of employment protection (with higher values reflecting stricter employment protection); *I* is an indicator variable with $I = 1$ if $q_1^H > q_2^H$ and $I = 0$ otherwise. By contrast, there is no employment protection regulation in country *F* (i.e., $\lambda^F = 0$).[13]

Let us now describe the firm's decision sequence. In stage one, the firm, located in country *H*, chooses its output level for period one, while facing uncertainty about period-two demand. At the start of period two, period-two demand uncertainty is resolved and the firm decides whether or not to relocate to region *F* (stage two). In the final stage (stage three), it chooses its period-two output level. There are two possible dynamic location equilibria. Using H_t and F_t, respectively, to denote Home and Foreign as the chosen production location in time period *t*, we have (H_1, H_2), the equilibrium in which the firm stays in the initial production location, and (H_1, F_2), the equilibrium in which the firm relocates to the region without employment protection. Naturally, in practice, the equilibrium without relocation will occur most of the time since the firm would not have chosen *H* as its initial location otherwise. However, since we want to analyse the relocation decisions of firms out of locations with employment protection, we will determine in the next section when the relocation equilibrium (H_1, F_2) is likely to occur.

Relocation and employment protection

[13] It is straightforward to incorporate employment protection in Foreign, with $\lambda^H > \lambda^F$. This would raise the barrier to entry into Foreign and therefore reduce the attractiveness of that location. As a result, the firm's propensity to relocate to Foreign would fall, but the *qualitative* relationship between the firm's exit cost from Home from Home's employment protection and that firm's propensity to relocate to Foreign would remain unaltered.

Using backward induction, we first examine the firm's location and production decisions in period two. Subsequently, we solve for the firm's production level in period one.

In period two, the firm relocates if period-two profits from relocation, $\pi_2(H_1, F_2)$, exceed second-period profits from staying in country *H*, $\pi_2(H_1, H_2)$. So, the firm's relocation condition is:

$$\pi_2(H_1, F_2) > \pi_2(H_1, H_2). \quad (4)$$

If the monopolist relocates to *F*, it shuts down its plant in *H*, thus incurring employment protection induced exit costs, $\lambda^H \alpha_l q_1^H$.[14] In addition, the set-up costs of the new plant in country *F* have to be paid. Hence, second-period profits in case of relocation are:

$$\pi_2(H_1, F_2) = (p_2 - c^F) q_2^F - \lambda^H \alpha_l q_1^H - \Phi^F \quad (5a)$$

If, however, the firm decides to stay in *H* in period two, it occurs firing costs only if and to the extent that period-two output is lower than its period-one output level; its profit function is:

$$\pi_2(H_1, H_2) = (p_2 - c^H) q_2^H - I\lambda^H \alpha_l (q_1^H - q_2^H). \quad (5b)$$

A comparison of expressions (5a) and (5b) shows that $c^F < c^H$ is a necessary –but not sufficient– condition for relocation (i.e., for expression (4) to hold). In order to express the actual relocation condition (expression (4)) in terms of the model's parameters, we need to determine optimal period-two output levels for both locations (i.e., q_2^F and q_2^H).

[14] For simplicity, we abstract from partial relocation in the theoretical model. Partial relocation would be obtained when, for instance, the production process exhibits increasing marginal costs. Of course, real-world relocation is typically partial, which is how we define relocation in the empirical model. However, partial relocation does not alter the *qualitative* relationship between relocation and employment protection and hence the sign predictions obtained from our theoretical model are applicable to partial as well as complete relocation.

Let us first determine optimal second-period output levels for the case in which the firm decides (in stage two) to move production to *F*. Its optimal output level is then obtained by maximising expression (5a) with respect to q_2^F. If period-two demand is the same as period-one demand, optimal period-two output is given by:

$$q_2^F = \frac{a - c^F}{2}. \tag{6a}$$

But, if the permanent positive demand shock occurs in period two, then optimal output is:

$$q_2^F = \frac{a - c^F + \varepsilon}{2}. \tag{6b}$$

Subsequently, we calculate the optimal second-period output level in the alternative case to relocation, which is staying in country *H*. Then, the firm's optimal output level is obtained by maximising expression (5b) with respect to q_2^H and is given by:

$$q_2^H = \frac{a - c^H + I\lambda^H \alpha_l}{2} \tag{7a}$$

and

$$q_2^H = \frac{a - c^H + I\lambda^H \alpha_l + \varepsilon}{2}, \tag{7b}$$

when period-two demand is given by expression (2a) and (2b), respectively.

We assume that, if period-two demand is the same as period-one demand, the firm will stay in the initially chosen location, *H*, since nothing that affects the firm's relocation decision has changed.[15] Hence, only if there is a positive demand shock in period two, i.e.,

[15] If we were to incorporate a negative demand shock into our model and the firm was faced with a negative demand shock, it would *a fortiori* stay in country *H*. While including the possibility of a negative demand shock in our model would lower the probability of relocation, it would not change the relocation condition in any *qualitative* way (for a similar model that includes the possibility of a negative demand shock, see the Appendix in Dewit *et al.* (2009)). For simplicity, we here ignore the possibility of a negative demand shock.

the case in which demand is given by expression (2b), is relocation effectively a possible option. Focussing on this case, we rewrite the relocation condition (expression (4)) by substituting expressions (6b) and (7b) into expressions (5a) and (5b) and obtain:

$$\frac{(a-c^F)^2-(a-c^H+I\lambda^H\alpha_l)^2}{4}+\frac{\varepsilon(c^H-I\lambda^H\alpha_l-c^F)}{2}>\Phi^F+(1-I)\lambda^H\alpha_l q_1^H. \qquad (8)$$

So, with $c^H > c^F$, relocation is possible and, *ceteris paribus*, more likely if the positive demand shock is large; a large value for ε widens the difference between prospective operating profits in *F* and *H* (that is, the left-hand-side of the inequality in (8) increases). If there were no employment protection in *H* ($\lambda^H = 0$), the firm would relocate to country *F* provided that the gap in operating profits between *F* and *H* is wide enough to compensate for the entry costs (Φ^F) associated with relocation. However, given that there is employment protection in country *H* ($\lambda^H > 0$), a firm that considers relocating faces firing costs and hence exit costs from country *H* (captured by the second term of the right-hand-side of the inequality in (8)). So, relative to the case in which there is no employment protection in *H*, the gap in operating profits between *F* and *H* now needs to be wider for the firm to relocate to country *F* in order to compensate for the additional exit costs associated with relocation.

We now turn to period-one output. Since we want to focus on the relocation equilibrium (H_1, F_2), we assume that condition (8) is met: a demand boom, if it occurs, is assumed to be sufficiently large to cause relocation. In stage one, the firm determines its optimal period-one output level, knowing that it may relocate in period two. It chooses q_1^H by maximising expected profit ($E\pi$), with:

$$E\pi = \pi_1 + \rho\pi_2^{H_1H_2} + (1-\rho)\pi_2^{H_1F_2} \qquad (9)$$

and $\pi_1 = (p_1 - c^H)q_1^H$. Maximising expression (9) with respect to q_1^H yields:

$$q_1^H = \frac{a - c^H - (1-\rho)\lambda^H \alpha_l - I\rho\lambda^H \alpha_l}{2}. \qquad (10)$$

First of all, comparing expressions (10) and (7a) shows $q_1^H < q_2^H$; hence $I = 0$ in expressions (7a), (7b), (8) and (10). Second, expression (10) shows that the firm, when deciding its production level in period one, takes into account that it may want to relocate in period two by restricting its first-period output somewhat (reflected by $-(1-\rho)\lambda^H \alpha_l / 2$) in order to limit future exit costs in case of relocation.

Having fully solved the model, let us now rewrite the relocation condition in (8), using $I = 0$, as:

$$\frac{(a - c^F)^2 - (a - c^H)^2}{4} + \frac{\varepsilon(c^H - c^F)}{2} > \Phi^F + \lambda^H \alpha_L q_1^H \qquad (11)$$

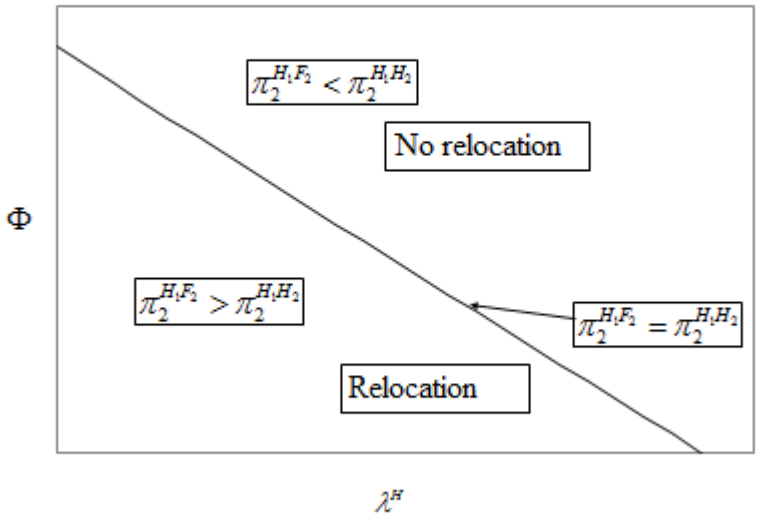
Thus, *ceteris paribus*, an increase in marginal production cost in *H* or a decrease in marginal production costs in *F* raises the operating profits from relocation and hence the propensity to relocate. An increase in fixed costs for entering *F* raises the entry cost in the prospective new location and hence lowers the propensity to relocate. Importantly, an increase in the degree of employment protection in *H* raises exit costs from *H*, which tends to lower a firm's propensity to relocate from *H*.[16]

Figure 1 illustrates the firm's propensity to relocate as a function of the degree of employment protection in country *H*. Along the depicted locus, the firm is indifferent between relocating to *F* or staying in *H* ($\pi_2(H_1, F_2) = \pi_2(H_1, H_2)$). More specifically,

[16] We have $d(\lambda^H \alpha_l q_1^H) / d\lambda^H > 0$ provided that the probability of relocation is not too high compared to the first-period output of the firm (i.e., $1 - \rho < (a - c^H) / 2\lambda^H$). We assume this to be the case to ensure the firm wanted to produce in Home as its initial location.

the locus represents the critical level of fixed entry costs into F, Φ^F, at which $\pi_2(H_1, F_2) = \pi_2(H_1, H_2)$ for varying levels of employment protection, λ^H. Below the locus, condition (8) is met, meaning that the firm will relocate. Above the curve, the relocation condition in (8) is violated and hence the firm will not relocate. As the degree of employment protection in country H increases, the firm's propensity to relocate falls, which is reflected in the negative slope of the $\pi_2(H_1, F_2) = \pi_2(H_1, H_2)$-locus.

Figure 1:Employment protection and relocation



Firm-specific characteristics, employment protection and relocation

In this section we ask how firm-specific differences affect a firm's propensity to relocate. As we are particularly interested in the effect of employment protection on relocation, we focus on those firm characteristics that affect the exit costs from country H, induced by

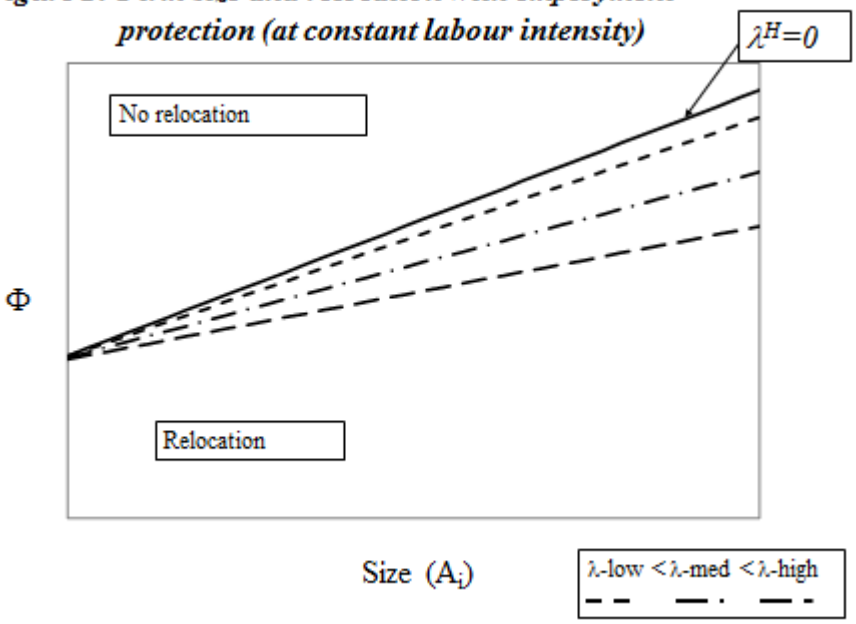
employment protection: firm size, productivity and labour intensity. Using comparative statics, we examine how a firm's propensity to relocate is affected by a change in one of these firm attributes. In order to do this, it proves convenient to define $A^H \equiv a - c^H$ and $A^F \equiv a - c^F$, where $A^F = \theta A^H$ with $\theta > 1$ (as mentioned earlier, $c^F < c^H$, implying $A^F > A^H$, is a necessary condition for relocation). Note that, since unit factor requirements, α_l and α_k, are firm-specific, c^H and c^F and hence A^H and A^F are firm-specific too.

First, we examine how firm size affects a firm's propensity to relocate. A^H can be interpreted as a determinant of firm size in period one. Also, since A^H is inversely related to the average variable cost of production, A^H could, alternatively, be viewed as an indicator of firm productivity. We start by examining the effect of an increase in A^H on the condition in (11) when there is no employment protection in country H (i.e., at $\lambda^H = 0$). In that case, a change in A^H only affects the left-hand side of the inequality. Using $A^F = \theta A^H$, the derivative of the left-hand side with respect to A^H is equal to $\frac{(\theta - 1)}{2}(A^H + \varepsilon)$, which is positive (since $\theta > 1$). So, in the absence of employment protection, larger –more productive– firms have a higher propensity to relocate.[17] However, from the previous subsection, we know that employment protection in H ($\lambda^H > 0$) will lower the propensity to relocate of firms located in H. Here we ask whether and to what extent employment protection affects the exit costs of firms *differentially*. Exit costs are represented by $\lambda^H \alpha_l q_1^H$, on the right-hand side of the

[17] This is consistent with the result found in Helpman *et al.* (2004) that only the most productive firms engage in FDI as only they make sufficient operating profit to cover the fixed cost of FDI.

inequality in (11). We have $d(\lambda^H \alpha_l q_1^H)/dA^H = \lambda^H \alpha_l / 2 > 0$. This implies that, *ceteris paribus*, larger and more productive firms have higher exit costs from a country with high employment protection than their smaller and less productive counterparts, which mitigate their relatively higher potential gains from relocation. This suggests that employment protection tends to narrow the differences in the propensity to relocate between large and small firms and between very productive and less productive firms. This is illustrated in Figure 2, which depicts the critical fixed entry cost into country *F* (Φ^F) for which a firm is indifferent between relocation and no relocation ($\pi_2(H_1, F_2) = \pi_2(H_1, H_2)$) as a function of firm size. For different degrees of employment protection, the slope of the locus along which $\pi_2(H_1, F_2) = \pi_2(H_1, H_2)$ is much smaller as the degree of employment protection increases, reflecting the fact that the difference between small and large firms in terms of their propensity to relocate shrinks as λ rises in the country in which the firms are initially located.

Figure 2: Firm size and relocation with employment protection (at constant labour intensity)

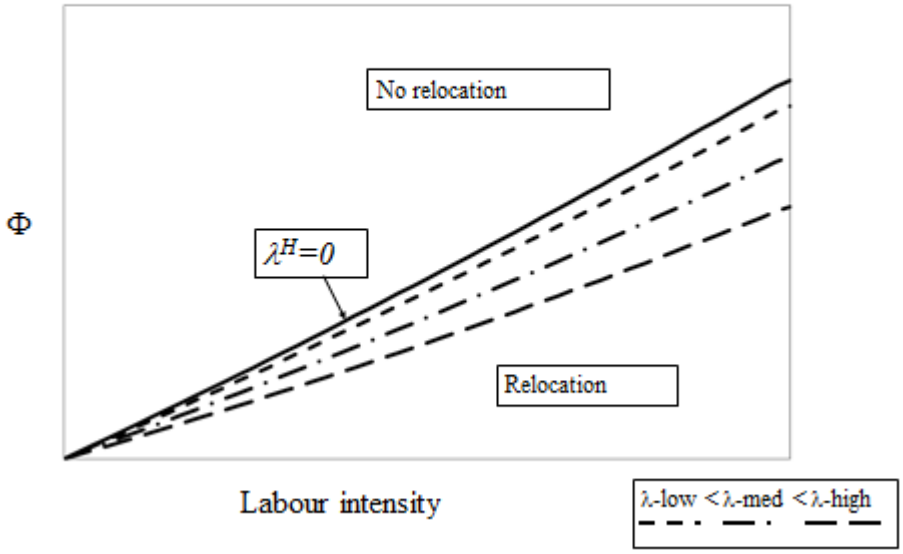


Next, we take a closer look at the effect of *labour intensity* on a firm's propensity to relocate. To isolate the labour intensity from the firm productivity effect, we compare the propensity to relocate for home firms that are equally productive, or, have the same marginal production costs (c^H) –and, in our model, thus have the same size, A^H–, but operate with different relative labour intensities (denoted by $l/k = \alpha_l / \alpha_k$). An increase in firm-specific labour intensity that leaves c^H unaffected implies $dc^H / d\alpha_l = w^H + (d\alpha_k / d\alpha_l) r^H = 0$, which in turn implies $d\alpha_k / d\alpha_l = -w^H / r^H$.

We first determine how such an increase in relative labour intensity of the firm affects its potential gains from relocation (which are captured by the left-hand side of expression (11)). Differentiating the left-hand side of the inequality in (11) with respect

to α_l (while keeping c^H constant) yields $-(A^F+\varepsilon)[w^F - r^F(w^H/r^H)]/2$. As country F was assumed to be relatively labour abundant (i.e., $w^H/r^H > w^F/r^F$), we have $-(A^F+\varepsilon)[w^F - r^F(w^H/r^H)] > 0$, meaning that the gains of relocation from countries that are relatively capital-abundant (i.e., where labour is relatively expensive) is higher for more labour intensive firms. Turning to the costs from relocation (captured by the right-hand side of the inequality in (11)), we focus on the effect of labour intensity on the exit cost of relocation. Employment protection in the country from where the firm considers relocation raises exit costs ($\lambda^H \alpha_l q_1^H$) and these exit costs are higher the more labour intensive the firm is (i.e., the higher α_l). So, among equally productive, equally sized firms, we expect that highly labour-intensive firms gain most from relocation, while at the same time being hindered most in their relocation decision if they face high levels of employment protection in the country from which they consider relocation. Thus, we expect that the difference in relocation propensity between firms with a high and a low labour intensity will be narrowed by employment protection. Figure 3 illustrates this. As a firm's labour intensity rises, its propensity to relocate increases (indicated by the fact that the $\pi_2(H_1, F_2) = \pi_2(H_1, H_2)$-locus is positively sloped), but this increase is significantly dampened if the degree of employment protection in country *H* is high.

Figure 3:Labour intensity and relocation with employment protection (at constant firm size)



3. Empirical evidence

Empirical Model

The above discussion of the theoretical model provides a number of testable hypotheses which we investigate in the remainder of the paper:

1. The level of employment protection in the home country is negatively associated with the relocation decision of the firms that produce there.

While this is, *per se*, not surprising, taking into account firm heterogeneity provides a more complex set of hypotheses:

2. Firm size, productivity and labour intensity affect a firm's propensity to relocate positively.

3. Employment protection lowers the propensity to relocate for large firms more than for small firms, for highly productive firms more than for less productive

firms, and more for firms with a high labour intensity than for those with a low labour intensity.

In order to check the empirical validity or otherwise of these theoretically derived hypotheses, we propose to estimate the propensity to relocate for firm *i*, $Pr(D)_{it}$, conditional on a set of covariates. Specifically, in order to examine hypotheses 1 to 3 we estimate equations

$$Pr(D)_{it} = \beta_1 \lambda_{ht} + \beta_2 C_{it} + \beta_3 (\lambda_{ht} * C_{it}) + \beta_4 X_{it} + \varepsilon_{it} \quad (12)$$

where λ_{ht} is the level of employment protection in firm *i*'s home country *h* at time *t*. C_{it} is, alternatively, the size, productivity or labour intensity of firm *i* at time *t* and X_{it} is a vector of control variables. The model also includes full sets of industry, year and country dummies. Hypotheses 1 to 3 imply $\beta_1 < 0$, $\beta_2 > 0$ and $\beta_3 < 0$.

Data description

The empirical model described in equations (12) is estimated using firm level data on the location decisions of firms from 29 OECD home countries. Our data covers both the manufacturing and services sector. While the theoretical model was set up with the production processes in the manufacturing sector in mind, we also conduct the empirical analysis for services to see whether or not similar conclusions can be drawn for relocating firms in service sectors.

The dataset is collected from ORBIS, which is a comprehensive and rich firm-level dataset provided by Bureau van Dijk.[18] Bureau van Dijk collects financial, economic and other firm-level information from various sources, including official bodies

[18] BvD is a leading electronic publisher of annual account information on private and public firms around the world. For further details regarding the data, including access issues, see www.bvdep.com.

such as Companies House in the UK and similar commercial and official registries in other countries. Our sample includes an unbalanced panel of firms in 29 OECD countries for the period 1997-2007. We have information on the characteristics of the firms, such as location, output, employment, labour intensity, productivity, industry classification on an annual basis, and we can crucially observe whether they have reduced their operations at home and at the same time set up affiliates abroad.

A "relocation" in our empirical analysis is defined as a firm reducing their operations at home by more than 10 per cent of their size (measured in number of employees) and at the same time opening up a new foreign affiliate or acquire an existing firm abroad; similar to Pennings and Sleuwaegen (2000). The establishment of the foreign affiliate is based on the date of incorporation of the foreign affiliate which is also available in the data set. A firm owns a foreign affiliate if it holds at least 10 percent of the voting stocks.[19] Since a firm may have more than one foreign affiliate and therefore qualifies potentially as having carried out more than one relocation, we construct the dataset in bilateral form.

We use two-digit primary NACE industry Codes to distinguish firms in the manufacturing sector (i.e. NACE 15-37) and the services sector (i.e. NACE 50-74). Since our analysis is based on registered firms and their filed accounts, all large firms as

[19] ORBIS reports firm accounts in either consolidated or unconsolidated form. We include only unconsolidated accounts as they represent the domestic activities of firms and exclude any information from affiliates at home or abroad. In contrast, consolidated accounts aggregate the activities of all firms belonging to a group worldwide, regardless of location and industrial affiliation.

well as a significant share of small and medium sized firms are included in the database, which provides a good coverage across OECD countries.[20]

Annual data on employment protection are obtained from the World Competitiveness Report of the World Economic Forum.[21] This is an index that is constructed from extensive surveys of managers in 138 countries, conducted by the *World Economic Forum*. In the survey, participants are asked to give a score to a number of questions describing the overall business climate and competitiveness of the country in which the firm operates. The scale of this index for the period 1997-2007 ranges from 1 to 7. The particular criterion for the index used here is: "*Hiring and firing practices are too restricted by government or are flexible enough*".

The index is defined in such a way that a higher value reflects a more protected labour environment. In other words, λ is scaled such that a higher index refers to a higher degree of employment protection. Hence, a negative sign of the relevant coefficient will indicate that higher labour protection hinders relocation ($\beta_1 < 0$), as expected from the theoretical discussion.

We measure a firm's size by its number of employees. Labour intensity is measured by the ratio of labour to capital. We measure productivity by estimating total factor productivity using the now common method by Levinsohn and Petrin (2003), which controls for endogeneity in inputs.

Other firm level controls that may be correlated with the propensity to relocate are a firm's average wage level and intangible assets. Higher wages faced by firms at home

[20] Desai *et al.* (2003) discuss data collection by Bureau van Dijk and conclude that, across countries, the database represents economies quite well. Klapper *et al*. (2004) also point to its large coverage compared to other data sources.
[21] Similar data were used by Di Tella and MacCulloch (2005) and Amiti and Wakelin (2003).

increase the likelihood for them to consider relocation options abroad (as suggested by an increase in c^H in the theoretical model). Intangible assets are used as in (imperfect) indicator of firm-specific assets (Markusen, 1995), with higher levels of intangible to total assets increasing a firm's likelihood of moving abroad via relocation, in order to reap the benefits of its firm specific advantages.

As each OECD member country has its own institutional environment in which firms operate, we control for some of the time varying country-level differences by including the corporate tax rate in the home country, as one of the main macroeconomic variables determining firm location and relocation (De Mooij and Ederveen, 2003). We expect that the higher the tax rate in the home country, the higher the likelihood of firms to move abroad.

Finally, since we not only know the home country of the investor but also the destination country to which the relocation takes place, we include in the empirical specification the level of employment protection in the destination country as an additional covariate. This allows us to interpret the effect of the home level of employment protection for a given level of protection in the host country. The definition and sources of all variables included in the model is provided in the appendix.

Table 1 shows the coverage of OECD firms that either relocate or not, at some point during our sample period 1997-2007. The majority of relocating firms are based in Europe and North America with significant numbers from Eastern Europe as well as Japan and South Korea. These multinational firms invest heavily in other developed or OECD countries; only around 16 per cent of affilates are located outside the OECD (i.e. 11,240 out of 69,948). Since relocation is quite a drastic decision, it is not surprising that

firms that actually relocate make up a small proportion of all firms. In other words, column one shows that the number of firms that do not relocate within the period 1997-2007 is much higher than the number of firms that relocate in almost every OECD country.

Table 1: Distribution of Relocation across OECD countries (1997-2007)

	Employment protection index	Number of firms **not** relocating	Number of Firms that relocate	No of affiliates located in:
Austria	3.69	2,498	165	1,541
Australia	3.61	102	2	147
Belgium	4.37	2,531	416	915
Canada	2.59	1,390	21	941
Switzerland	1.74	3,745	178	1,275
Czech Republic	3.22	519	98	2,662
Germany	4.78	4,433	362	9,855
Denmark	1.67	1,418	33	666
Estonia	2.74	228	69	572
Spain	4.14	4,014	579	4,836
Finland	3.58	733	174	527
France	4.65	4,495	576	3,924
Great Britain	2.51	1,907	403	9,367
Greece	4.24	92	2	275
Hungary	2.69	107	4	385
Ireland	3.58	242	10	1,253
Italy	4.57	3,469	906	3,246
Japan	3.45	640	85	412
Korea	3.24	86	19	199
Luxembourg	3.75	87	9	918
Mexico	3.52	69	5	719
Netherlands	4.10	5,850	607	2,867
Norway	4.41	910	101	1,123
Poland	3.40	195	7	3,457
Portugal	4.23	421	30	866
Sweden	4.57	2,440	453	1,000
Slovenia	4.31	148	40	250
Slovakia	2.95	290	30	661
United States	1.86	3,167	39	3,075
RoW (non-OECD)		--	--	11,240
Total		46,226	5,423	69,948

Source: Authors calculations using Orbis.

Table 2 presents summary statistics for the key variables that characterise relocating firms and firms which do not relocate, for the manufacturing and services

sector separately.[22] They suggest that manufacturing firms are on average larger, more labour-intensive, and more productive than services firms. Distinguishing relocating from non-relocating firms shows that, in manufacturing, we find that the former are "better" in terms of most aspects of firm characteristics measured, namely larger and more productive, but – somewhat surprisingly – less labour intensive. The differences between these two groups of firms in the services sector seem much less pronounced. For this reason, we estimate the empirical model separately for manufacturing and services.

Table 2: Summary Statistics of firm-level variables

Variable (definition)	Relocating Firms	Non – Relocating Firms
	Mean (std. Dev.)	Mean (std. Dev.)
High-tech Manufacturing sector		
Number of employees	1114	533
	(3033)	(3124)
Log Labour-intensity	-3.88	-3.35
	(1.76)	(1.35)
Log TFP	5.18	4.82
	(0.80)	(0.62)
Low-tech Manufacturing sector		
Number of employees	677	392
	(1867)	(2556)
Log Labour-intensity	-4.25	-3.67
	(1.80)	(1.29)
Log TFP	4.92	4.72
	(0.81)	(0.60)
Services sector		
Number of employees	389	343
	(2293)	(3779)
Log Labour-intensity	-3.61	-3.03
	(2.63)	(2.13)
Log TFP	7.82	7.55
	(2.00)	(1.84)

Source: Authors' calculations using Orbis database.

[22] We distinguish manufacturing into high- and low-tech, based on the standard OECD classification (OECD, 2003). This classification is only implemented for manufacturing. While the OECD considers three services industries to be high technology (post/telecommunications, computers and R&D), we have only a small number of firms that can be considered high tech service firms. Hence, we do not distinguish services firms into high and low tech.

Estimation results

The baseline estimation results from probit regressions of equation (12) without the vector *X* are presented in Table 3 for firms in manufacturing industries. Overall, we find broad empirical support for hypotheses 1 to 3 stated above.

Table 3: Baseline results: manufacturing sector

	1	2	3
Home λ	-0.000155***	-0.000447***	-0.000336***
	(5.50e-05)	(6.12e-05)	(4.48e-05)
Size	0.000261***		
	(3.07e-05)		
Size * Home λ	-1.78e-05**		
	(7.48e-06)		
Labour intensity		5.35e-05	
		(4.70e-05)	
Labour intensity * Home λ		-2.73e-05**	
		(1.12e-05)	
TFP			7.56e-07***
			(1.64e-07)
TFP * Home λ			-1.37e-07***
			(3.55e-08)
Predicted probability	0.0005763	0.0006425	0.0006224
Wald chi2	2473.21	1948.61	2286.47
Prob > chi2	0.0000	0.0000	0.0000
Pseudo R2	0.0377	0.0265	0.0303
Log pseudolikelihood	-33401.776	-30952.892	-27790.138
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Observations	5,622,640	5,031,298	4,588,294

Notes: Coefficients are shown as marginal effects.
All explanatory variables are lagged one period.
All specifications include a full set of year and industry dummies
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In column (1) we consider the role of firm heterogeneity in terms of firm size for the link between employment protection and relocation. We find, as expected, that higher employment protection in the home country discourages firms' relocation

activity.[23] Also, larger firms are more likely to relocate activity. As suggested by our theoretical model, the negative coefficient on the interaction of size * Home λ indicates that employment protection lowers the propensity to relocate more for firms that are large.

In columns (2) and (3) we consider the impact of the other firm characteristics included in our theoretical model, namely labour intensity and productivity, respectively. Results on the firm level variables and interaction terms again provide support for our expectation. In particular, we find that while more productive firms are more likely to relocate, their propensity to relocate is significantly more mitigated by employment protection than their less productive counterparts' relocation propensity. Although our results for the manufacturing sector as a whole do not give support to our expectation that the more labour intensive firms are more likely to relocate, we do find that employment protection reduces the probability to relocate more for firms that are more labour intensive.

In order to identify the effect of home country employment protection more appropriately, we report in Table 4 estimations which include the vector of control variables at the firm, home and destination country level as discussed above. The results show that the inclusion of these variables does not change our findings on the importance of employment protection and its interaction with firm characteristics.

[23] Since we report marginal effects, we can also comment on the economic importance of these effects. The overall probability of relocating in our sample is 0.058 percent (column 1). An increase in Home λ by one unit (roughly equivalent to increasing employment protection from the level of Australia to that of France – see Table 1) increases the probability by 0. 016 percentage points.

Table 4: Estimations with additional covariates, manufacturing sector

	1	2	3
Home λ	-0.000319***	-0.000548***	-0.000404***
	(8.93e-05)	(8.18e-05)	(6.77e-05)
Size	0.000230***		
	(5.52e-05)		
Size * Home λ	-1.90e-05		
	(1.32e-05)		
Labour intensity		4.72e-05	
		(5.89e-05)	
Labour intensity *Home λ		-2.58e-05*	
		(1.43e-05)	
TFP			1.65e-06***
			(5.08e-07)
TFP * Home λ			-3.24e-07***
			(1.07e-07)
Host λ	1.74e-07	4.18e-06	6.15e-06
	(1.45e-05)	(1.52e-05)	(1.56e-05)
Home tax rate	0.00130***	0.00151***	0.00164***
	(0.000358)	(0.000366)	(0.000373)
Intangible to Total Assets	0.000276*	0.000474***	0.000496***
	(0.000162)	(0.000159)	(0.000162)
Average Wage	2.79e-08***	1.12e-08**	7.03e-09
	(3.79e-09)	(4.34e-09)	(5.58e-09)
Predicted probability	0.0005758	0.0005977	0.0005916
Wald chi2	1176.23	932.94	959.46
Prob > chi2	0.0000	0.0000	0.0000
Pseudo R2	0.0349	0.0281	0.0312
Log pseudolikelihood	-16250.427	-16122.849	-14902.945
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Observations	2,834,904	2,810,382	2,591,694

Notes: Coefficients are shown as marginal effects.
All explanatory variables are lagged one period.
All specifications include a full set of year and industry dummies
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In order to check whether industry heterogeneity drives our results, we distinguish the manufacturing sector into high and low tech subsectors. We present the results of re-estimating the models on the separate sub-samples in Tables 5 and 6 for low and high tech manufacturing sectors, respectively.

Table 5: Manufacturing sector – Low tech sector (NACE 15-23, 25-28, 36-37)

	1	2	3
Home λ	-0.000385***	-0.000659***	-0.000407***
	(0.000112)	(0.000110)	(8.63e-05)
Size	0.000122*		
	(7.39e-05)		
Size * Home λ	-3.09e-06		
	(1.77e-05)		
Labour intensity		0.000254***	
		(7.97e-05)	
Labour intensity *Home λ		-6.24e-05***	
		(1.90e-05)	
TFP			1.95e-07
			(7.33e-07)
TFP * Home λ			-2.92e-08
			(1.54e-07)
Host λ	-2.99e-05	-2.73e-05	-2.46e-05
	(1.87e-05)	(1.92e-05)	(1.95e-05)
Intangible to Total Assets	8.00e-05	0.000258	0.000397
	(0.000262)	(0.000254)	(0.000259)
Average Wage	3.66e-07***	2.76e-07***	2.72e-07***
	(3.37e-08)	(3.96e-08)	(3.50e-08)
Tax rates	0.00123***	0.00149***	0.00146***
	(0.000385)	(0.000389)	(0.000390)
Predicted probability	0.0005633	0.0005725	0.000554
Wald chi2	712.86	704.62	715.83
Prob > chi2	0.0000	0.0000	0.0000
Pseudo R2	0.0324	0.0294	0.0319
Log pseudolikelihood	-8658.2476	-8575.3564	-7729.5616
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Observations	1,586,158	1,570,480	1,445,726

Notes: Coefficients are shown as marginal effects.
All explanatory variables are lagged one period.
All specifications include a full set of year and industry dummies
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The tables show that the results on the importance of firm heterogeneity hold in both sub-sectors, albeit with some important differences. We find in both sub-sectors negative and statistically significant effects of employment protection on the probability

to relocate. However, with regard to the importance of the firm-specific characteristics, we find some interesting differences.

Starting with low tech manufacturing, it is the degree of labour intensity –rather than size or productivity– that induces firms to relocate abroad; firms that are more labour intensive are more likely to relocate. This is consistent with the estimated coefficient for firms' average wage level, indicating that firms with a higher average wage are more likely to relocate. It is also in line with our theoretical model in which firm relocate in search of cheap labour and are therefore more likely to do so when they are relatively labour intensive. Importantly, we find confirmation for our hypothesis that employment protection will hinder these labour-intensive firms more than their more capital intensive counterparts, as indicated by the significantly negative coefficient on the interaction term employment protection and labour intensity.

Turning to high skill manufacturing, we find that for these sectors productivity and size are crucial in determining the propensity to relocate. Clearly, the search for cheap labour is not the driving force for relocation for these firms, which is reflected in the fact that the coefficient on labour intensity and average wages are negative. This suggests that, unlike in low tech manufacturing sectors, the type of labour hired by these firms is highly skilled and highly productive. In fact, more productive, larger firms are significantly more likely to relocate while they are also the ones that are most hampered by employment protection.

Table 6: Manufacturing sector – High tech sector (NACE 24, 29-35)

	1	2	3
Home λ	-0.000295**	-0.000428***	-0.000422***
	(0.000139)	(0.000122)	(0.000110)
Size	0.000328***		
	(7.89e-05)		
Size *Home λ	-3.11e-05*		
	(1.88e-05)		
Labour intensity		-0.000165**	
		(7.96e-05)	
Labour intensity *Home λ		2.12e-05	
		(1.97e-05)	
TFP			2.86e-06***
			(4.63e-07)
TFP * Home λ			-5.89e-07***
			(1.01e-07)
Host λ	2.84e-05	3.69e-05	3.62e-05
	(2.18e-05)	(2.37e-05)	(2.45e-05)
Intangible to Total Assets	0.000292	0.000549***	0.000505**
	(0.000205)	(0.000212)	(0.000215)
Average Wage	-4.23e-08	-3.84e-07***	-5.99e-07***
	(3.23e-08)	(1.33e-07)	(2.24e-07)
Tax rates	0.00192**	0.00217**	0.00255***
	(0.000769)	(0.000850)	(0.000882)
Predicted probability	0.0005545	0.0005995	0.0006075
Wald chi2	809.51	584.81	614.32
Prob > chi2	0.0000	0.0000	0.0000
Pseudo R2	0.0514	0.0378	0.0416
Log pseudolikelihood	-7473.5387	-7450.1291	-7078.6361
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Observations	1,238,160	1,229,316	1,139,134

Notes: Coefficients are shown as marginal effects.
All explanatory variables are lagged one period.
All specifications include a full set of year and industry dummies
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Although relocation in services has been increasing, it is still relatively low and seems to be concentrated in a small number of subsectors (e.g., Cohen, 2005). Since

we have information on firms in services sectors, we separately ran probit models of equation (12) for firms in services sectors. The results are presented in Table 7.

Employment protection in the source country has the expected negative effect, implying that employment protection also acts as a barrier to exit for firms in services. However, when we look at firm characteristics, size, labour intensity and productivity hardly seem to matter as determinants of a firms' propensity to relocate. While this may not be too surprising (as our theoretical model was set up to capture relocation decisions in manufacturing rather than services), it also suggests that relocation motives for firms in services are very different from those in manufacturing (for instance, market presence and proximity to consumers may be important for services). Nevertheless, even for relocation decisions of these firms, employment protection seems to be a significant barrier to exit.

4. Conclusions

This paper examines the determinants of the decision to relocate activities abroad for MNEs that are located in 29 OECD countries. Particular attention is paid to source-country employment protection as a barrier to exit. For all sectors we find that stricter employment protection in the home country discourages firms' relocation. Highly labour intensive firms in low-skill manufacturing and large, highly productive firms in high-skill manufacturing have, *ceteris paribus*, higher propensities to relocate. Precisely these firms are, as suggested by our theoretical model, hampered most in their relocation decisions by home country employment protection. For firms in services, employment protection also seems to act as a barrier to exit for firms in services. However, size,

labour intensity and productivity hardly seem to matter for relocation decisions of firms in services.

Table 7: Estimation results for firms in services sector (NACE 50-74)

	1	2	3
Home λ	-0.000528***	-0.000260***	-0.000318***
	(7.96e-05)	(8.20e-05)	(7.85e-05)
Size	-2.66e-05		
	(3.47e-05)		
Size * Home λ	3.94e-05***		
	(8.36e-06)		
Labour intensity		-0.000176***	
		(3.40e-05)	
Labour intensity * Home λ		3.65e-05***	
		(8.20e-06)	
TFP			-6.30e-09
			(4.14e-09)
TFP *Home λ			1.54e-09*
			(9.17e-10)
Host λ	-6.41e-06	1.43e-05	-4.30e-06
	(1.57e-05)	(1.63e-05)	(1.64e-05)
Intangible to Total Assets	-0.000825***	-0.000525***	-0.000448***
	(0.000153)	(0.000156)	(0.000158)
Average Wage	3.19e-08***	2.08e-08***	1.96e-08***
	(3.56e-09)	(4.39e-09)	(4.39e-09)
Tax rates	-0.000310	-0.000442	-9.85e-05
	(0.000478)	(0.000493)	(0.000489)
Predicted probability	0.000893	0.0009122	0.0008861
Wald chi2	2049.20	1795.29	1399.96
Prob > chi2	0.0000	0.0000	0.0000
Pseudo R2	0.0274	0.0251	0.0204
Log pseudolikelihood	-32282.678	-30582.42	-29240.374
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Observations	3,937,188	3,716,356	3,692,504

Notes: Coefficients are shown as marginal effects.
All explanatory variables are lagged one period.
All specifications include a full set of year and industry dummies
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Overall, our theoretical and empirical analysis suggests that the relationship between labour market rigidities and foreign direct investment is more complex than generally postulated in the literature. In particular, we show that employment protection

in the home country matters, while most earlier work focuses on what happens in the host country. From a policy point of view, our results suggest that countries with strict employment protection may be in a stronger position to slow down the exit of large, productive and highly labour intensive firms than their counterparts with lax employment protection laws. This matters when one bears in mind the social adjustment costs that are potentially associated with industry relocation.

References

Aw, B.Y. and Y. Lee, 2008, "Firm heterogeneity and location choice of Taiwanese multinationals", *Journal of International Economics*, 76, 403-415.

Amiti, M. and K. Wakelin, 2003, Investment liberalization and international trade, *Journal of International Economics*, 61, 101-126.

Amiti, M. and S. Wei, 2005, "Fear of service outsourcing: is it justified?", *Economic Policy*, 20, 308-347.

Baldwin, R. and T. Okubo, 2006, "Heterogeneous firms, agglomeration and economic geography: spatial selection and sorting", *Journal of Economic Geography*, 6, 323-346.

Barba-Navaretti, G. and A. Venables, 2004, *Multinational Firms in the World Economy*, Princeton University Press.

Bertola, G., and R. Rogerson, 1997, Institutions and labor reallocation, *European Economic Review*, 41, 1147–1171.

Bertola, G., A. Dabusinskas, M. Hoeberichts, M. Izquierdo, C. Kwapil, J. Montornès and D. Radowski, 2010, *Price, Wage and Employment Response to Shocks. Evidence from the WDN Survey*, ECB Wage Dynamics Network, Working paper No 1164.

Bhagwati, J. and A. Blinder, 2009, *Offshoring of American Jobs: What Response from US Economic Policy?*, MIT Press: Cambridge, MA.

Blinder, A., 2007, *Offshoring: Big Deal, or Business as Usual?*, CEPS Working Paper No. 149.

Blonigen, B.A., 2005, A review of the empirical literature on FDI determinants, *Atlantic Economic Journal*, 33, 383-403.

Burmester, B., 2012, The Exit Advantage: Overcoming Barriers to National Exit, In: Lydia Bals, Peter Ørberg Jensen, Torben Pederson, (ed.), *The Offshoring Challenge*, Springer Verlag.

Cohen, D., 2006, "Globalization and employment", in Auer, P., G. Besse and D. Méda (Eds.), *Offshoring and the Internationalization of Employment. A Challenge for a Fair Globalization*, Proceedings of the France/ILO Symposium, International Labour Organization, 17-36.

Chen, M. and M. Moore, 2010, "Location decision of heterogeneous multinational firms", *Journal of International Economics*, 80, 188-199.

De Mooij, R. and S Ederveen, 2003, Taxation and foreign direct investment: A synthesis of empirical research, *International Tax and Public Finance*, 10, 673-693.

Desai, M., Gompers, P.A. and Lerner, J., 2003, Institutions, Capital Constraints and Entrepreneurial Firm Dynamics: Evidence from Europe, NBER working paper No. 10165.

Dewit, G., H. Görg and C. Montagna, 2009, Should I stay or should I go? Foreign direct investment, employment protection and domestic anchorage, *Review of World Economics*, 145, 93-110.

Dewit, G., D. Leahy and C. Montagna, 2013, "Employment protection, flexibility and firms' strategic location choices under uncertainty", *Economica*, forthcoming.

Di Tella, R. and R. MacCulloch, 2005, The consequences of labor market flexibility: Panel evidence based on survey data, *European Economic Review*, 49, 1225-1259.

European Commission, 2012, *Reaping the Benefits of Globalization*, European Competitiveness Report 2012.

European Foundation for the Improvement of Living and Working Conditions, 2007, *Restructuring and Employment in the EU: The Impact of Globalisation*, European Restructuring Monitor Report 2007.

European Parliament, 2007, *Delocalisation of EU Industry. Delocalisation and the challenge of structural adjustment. A review of policy options*, European Parliament's committee on Industry, Research and Energy.

Garibaldi, P., 1998, Job flow dynamics and firing restrictions, *European Economic Review*, 42, No. 2, 245-75.

Gerosky, P., R. Gilbert and A. Jacquemin, 1990, *Barriers to Entry and Strategic Competition*, Harwood Academic Publishers, 99 p.

Görg, H., 2005, Fancy a stay at the "Hotel California"? The role of easy entry and exit for FDI, *Kyklos*, 58, 519-535

Haaland, J.I. and I. Wooton, 2002, "*Multinational investment, industry risk and policy competition*", CEPR Discussion Paper 3152.

Haaland, J.I., I. Wooton and G. Faggio, 2003, "Multinational firms: Easy come, easy go?", *FinanzArchiv* 59: 3-26.

Helpman, E., M. Melitz and S. Yeaple, 2004, Export versus FDI with heterogeneous firms, *American Economic Review*, 94, 300-316.

Javorcik, B.S. and M. Spatareanu, 2005, Do foreign investors care about labor market regulations? *Review of World Economics*, 141, 375-403.

Javorcik, B.S. and S.J. Wei, 2009, Corruption and cross-border investment in emerging markets: Firm-level evidence, *Journal of International Money and Finance*, 28, 605-624.

Klapper, L., L. Laeven, and R. Rajan, 2004, *Business Environment and Firm Entry: Evidence from International Data*, NBER working paper No. 10380.

Levinsohn, J. and A. Petrin, 2003, Estimating production functions using inputs to control for observables, *Review of Economic Studies*, 70, 317-341.

Markusen, James R. 1995. "The Boundaries of Multinational Enterprises and the Theory of International Trade." *Journal of Economic Perspectives* 9(2): 169–89.

Messina, J. and G. Vallanti, 2007, Job flow dynamics and firing restrictions: Evidence from Europe, *The Economic Journal*, 117, F279-F301.

Midelfart-Knarvik, K., H. Overman, P. Lane and J.-M. Viaene, 2002, "Delocation and European integration: Is structural spending justified?", *Economic Policy*, 17, 321-359.

Motta, M, and J. Thisse, 1994, "Does environmental dumping lead to delocation", *European Economic Review*, 38, 563-576.

Nicoletti, G., S. Golub, D. Hajkova, D. Mirza, G. and K. Yoo, 2003, *The Influence of Policies on Trade and Foreign Direct Investment*, OECD Economic Studies, No. 36.

OECD, 2003, Science, Technology and Industry Scoreboard, OECD, Paris.

Olney, W., 2011, A race to the bottom? Employment protection and foreign direct investment, Working Paper 2011-02, Williams College, Williamstown.

Okubo, T., P. Picard and J.-F. Thisse, 2008, "The spatial selection of heterogeneous firms", CEPR Discussion Papers, No. 6978.

Pennings, E. and L. Sleuwaegen, 2000, International relocation: firm and industry determinants, *Economics Letters*, 67, 179-186.

Stigler, G., 1968, *The Organization of Industry*, University of Chicago Press, 328 p.

UNCTAD, 2011, *World Investment Report 2011: Non-equity Modes of International Production and Development*, United Nations, New York.

Empirical Appendix

Variable definitions:

Firm size is measured using the natural logarithm of employees (Source: Orbis)

λ is the Employment protection index (Source: World Economic Forum)

Labour intensity is measured as the natural logarithm of the ratio of labour to capital, where capital is measured by fixed assets (Source: Orbis)

Average Wage is calculated by dividing a firm's total wage bill by the number of employees (Source: Orbis)

Total factor productivity estimated using the approach described in Levinsohn and Petrin (2003)

IATA is calculated as the ratio of intangible assets over total assets (Source: Orbis)

Rates of tax on income, profits and corporate gains (Source: World Economic Forum)