Should I stay or should I go? Foreign direct investment, employment protection and domestic anchorage

Dewit, Gerda; Görg, Holger; Montagna, Catia

Rev World Econ (2009) 145:93–110
DOI 10.1007/s10290-009-0001-x

ORIGINAL PAPER

Should I stay or should I go? Foreign direct investment, employment protection and domestic anchorage

Gerda Dewit · Holger Görg · Catia Montagna

Published online: 13 March 2009

Abstract This paper examines theoretically and empirically how employment protection legislation affects location decisions of multinationals. We depart from the "conventional wisdom" by examining not only the effect of protection on inward foreign direct investment (FDI), but also a country's ability to "anchor" potential outward investment. Based on our simple theoretical framework, we estimate an empirical model, using data on bilateral FDI and employment protection indices for OECD countries, and controlling for other labour market institutions and investment costs. We find that, while an "unfavourable" employment protection differential between a domestic and a foreign location is inimical to FDI, a high domestic level of employment protection tends to discourage outward FDI. The results are in line with our conjecture that strict employment protection in the firm's home country makes firms reluctant to relocate abroad and keeps them "anchored" at home.

Keywords Foreign direct investment · Employment protection · Domestic anchorage · Uncertainty

G. Dewit
National University of Ireland, Maynooth, Ireland

H. Görg (✉)
Kiel Institute for the World Economy, University of Kiel, Düsternbrooker Weg 120, 24105 Kiel, Germany
e-mail: holger.goerg@ifw-kiel.de

H. Görg
CEPR, London, UK

C. Montagna
University of Dundee, Dundee, UK

C. Montagna
GEP, University of Nottingham, Nottingham, UK

JEL Classification F23 · J80 · D80

1 Introduction

The increasing degree of economic integration and the liberalisation of foreign direct investment (FDI) policies worldwide have brought the determinants of the location of economic activity to the forefront of debates in policy circles and the popular press. Governments' concerns focus increasingly on their ability to attract and/or retain industries, an issue whose relevance is mirrored by the discussion in the recent article "*Another week, another firm quits the UK*" published in the British newspaper *The Observer*.[1]

The aim of this paper is to shed some light on the potentially complex effects of labour market flexibility (or the lack of it) on the location of economic activity.

Labour market laws and institutions are commonly regarded as crucial in determining the relative attractiveness of locations to internationally mobile firms, particularly if (as in the case of employment protection measures and redundancy payments) they affect the *flexibility* with which firms can adjust output and employment to evolving economic conditions. As a result, governments increasingly see labour market regulations as viable policy instruments in trying to influence the location decision of footloose firms. These measures, however, give rise to a policy trade-off for governments. On the one hand, by restricting firms' exit options, employment protection laws may deter inward FDI (e.g. Görg 2005; Haaland et al. 2003). This effect is reflected in the commonly held view that the substantial differences that exist between economies (even within the European Union) in labour market restrictions represent a source of unfair 'competitive advantage' for those locations with lower costs of employment adjustments. On the other hand, this type of labour market rigidities may help governments in *locking in* (domestic and foreign) firms, thus reducing outward investment aimed at substituting foreign for domestic employment.

Although a substantial amount of work exists on the impact of employment legislation on employment,[2] little research has been done on the relationship between the former and the location of industry. Moreover, to our knowledge, the limited body of articles that addresses this relationship fails to capture the complexity of the effects of employment protection on industry location because it focuses on the role of employment protection in undermining a location's ability to *attract new* footloose industries, without considering its role in *discouraging firms*' (*re*)*location abroad*. Haaland and Wooton (2002) and Haaland et al. (2003) provide theoretical analyses that formalise the detrimental effect of employment protection on inward FDI. This

[1] This quotes a chairman of a regional development agency in the UK as saying that "The big market now is in the retention of the investment business that is here". *The Observer*, "Another week, another firm quits the UK", by Oliver Morgan, 1 June 2003.

[2] Hiring and firing restrictions are typically not found to have a decisive role on overall rates of unemployment (e.g. Nickell 1998; Nickell et al. 2001), but are shown to reduce job reallocation rates and employment variation over the business cycle—e.g. Bentolila and Bertola (1990) and Garibaldi et al. (1997).

result is supported empirically by Görg (2005) who finds that host countries' firing costs are negatively related to inward FDI from the US, Nicoletti et al. (2003) who find that employment protection reduces FDI in OECD countries, and Javorcik and Spatareanu (2005) who find that labour market flexibility is positively associated with inward FDI in some Western and Eastern European countries. Dewit et al. (2003) argue that the relationship between labour market flexibility and FDI is more subtle. Their analysis suggests that employment protection may not necessarily hinder a country's ability to retain (and under certain conditions even attract) economic activity; since inflexibility implies commitment power, firms may prefer an inflexible location over a flexible one, even in an uncertain environment.

In this paper we enrich the existing literature by arguing that employment protection also has a 'domestic anchorage' effect because it affects a country's ability to retain their existing industrial base. Allowing for this effect has implications for the specification of empirical models of FDI which have not been taken into account in the literature to-date.

We use a simple theoretical model to examine how employment protection regulations affect the location and relocation decisions of a monopolist when alternative locations characterised by different degrees of employment protection are possible. We then test empirically the predictions of the model using panel data on bilateral FDI stocks and employment protection indices for OECD countries. The data also allow us to control for other aspects of labour market institutions, in particular the degree of unionisation of the labour market, the wage bargaining system, and investment costs. Our empirical analysis supports our conjecture that employment protection laws are likely to have different effects on firms' location decisions: whilst an 'unfavourable' employment protection differential between a domestic and a foreign location is inimical to inward FDI, a high domestic level of employment protection tends to discourage outward FDI. In other words, lay-off costs in their home country makes firms reluctant to relocate abroad and keeps them '*anchored*' at home.

The rest of the paper is organised as follows. A simple theoretical model is developed in Sect. 2. The empirical analysis is carried out in Sect. 3 and Sect. 4 concludes the paper.

2 Theoretical framework

In this section, we explore theoretically how differences in employment protection regulations between countries affect the location and relocation decisions of a firm operating in an uncertain environment when alternative locations are possible. To this end, we develop a simple two-period four-stage model that allows for the endogenous determination of both the initial location and the potential relocation choice of a monopolist choosing between two countries characterised by different levels of employment protection.[3] Since the purpose of this model is not to offer a

[3] The monopoly assumption is similar to the one in the model by Haaland et al. (2003). We make this assumption for simplicity as the main purpose of the model is to motivate our empirical analysis. For a theoretical analysis of the 'attraction versus retention' effects of employment protection in strategic settings, see Dewit et al. (2003).

fully developed theory of FDI in the presence of employment protection, we omit from the theoretical analysis all other factors (e.g. market size) that might affect FDI decisions.

We focus on the location decision of a monopolist over two periods ($t = 1, 2$). In period one, the monopolist chooses the initial location for its investment between two countries which we shall refer to as 'home' (h) and 'foreign' (f). These locations are assumed to represent an integrated market.[4] In period two, the firm will decide whether to remain in the initial location or to relocate.

The firm knows period one demand but faces uncertainty about future demand; this uncertainty is resolved at the start of period two. Demand in period one ($t = 1$) is given by $p_1 = a - bq_1$. To keep matters simple, we assume that there are only two possible states for period-two demand: with a given probability ρ, demand in $t = 2$ is the same as in $t = 1$; with the complementary probability $1 - \rho$, period-two demand will boom, i.e. $p_2 = a - bq_2 + \varepsilon$ with $\varepsilon > 0$ (note that ε is not a random variable, but simply a constant parameter, representing a positive demand shock). As will become clear, in our model a firm that initially located in home will not want to relocate to foreign if period two demand falls; hence, to keep our analysis as concise as possible we do not focus on this case in the main body of the paper but we allow for the possibility of a negative demand shock in an extended version of the model in the Appendix.[5]

Since future demand is uncertain, the firm values flexibility. However, flexibility may be hindered by employment protection regulations. We shall assume that the two countries differ in labour market institutions, with country h having tighter employment protection regulations in place than country f.

The firm's costs depend on where its production takes place. The marginal costs of production in the two locations are constant and denoted by c^h and c^f. When setting up a plant, a fixed cost of Φ^h and Φ^f, respectively, is incurred. Differences in fixed cost may, among other things, reflect the fact that when locating abroad a firm will typically incur additional FDI costs. Thus, it is plausible to assume that the fixed cost in f will be higher than in h—i.e. $\Phi^f > \Phi^h$, with the difference $(\Phi^f - \Phi^h)$ reflecting the cost of FDI.[6] In the presence of employment protection in the production location, redundancy payments will be incurred when a firm's production level in period two drops below the level in the previous period. In other words, employment protection costs are given by $\lambda^i(q_1^i - q_2^i)$ if $q_1^i > q_2^i$ $(i = h, f)$, where the subscripts refer to the time period and λ^i is a constant denoting the degree of employment protection in country i. For simplicity, we shall assume

[4] These assumptions allow us to focus on the effect of employment protection on location choice, while abstracting from other location determinants, such as market access and other aspects of labour market institutions whose importance for firms' location decisions is well understood. See, for instance, Markusen (2002) and Leahy and Montagna (2000a).

[5] As shown in the Appendix, the qualitative conclusions from our analysis remain unaltered. The only difference is that, with the possibility of a negative demand shock in period two, the attractiveness of home as the firm's initial location is further reduced.

[6] Clearly, the two countries could be taken to represent two generic locations considered by a firm with headquarters in a third country. In this instance, $\Phi^f > \Phi^h$ simply captures that the FDI costs for country f are higher than those for country h.

that the employment protection differential between h and f is $\lambda^h - \lambda^f = \lambda^h$, i.e. $\lambda^f = 0$.

The firm's decision sequence is as follows. In period one, the firm chooses a location (stage 1) and subsequently determines its production level (stage 2). In period two, when uncertainty is resolved, the firm considers whether is should relocate (stage 3) and then chooses its output level for that period (stage 4). The firm's location and relocation choices give rise to four possible intertemporal location patterns: the firm initially produces in 'home' and either stays there (h_1, h_2) or relocates to 'foreign' (h_1, f_2), or, the firm initially produces in 'foreign' and either stays there in the next period (f_1, f_2) or relocates to 'home' (f_1, h_2); subscripts 1 and 2, respectively, refer to the production location in period 1 and 2.

In order to investigate how employment protection affects a firm's possible relocation, the candidate equilibrium of special interest is (h_1, f_2), in which the firm relocates to the region without employment protection, after having chosen the region with employment protection as its initial production location. It is this equilibrium which we will focus on henceforth.[7] In particular, we want to examine the conditions under which (h_1, f_2) is an equilibrium.

The first condition, which will be discussed in Sect. 2.1, requires that the firm's period two profits need to be higher when relocating to 'foreign' than when staying in 'home', *given* that the firm chooses to locate in 'home' in period one, i.e. $\pi_2(h_1, f_2) > \pi_2(h_1, h_2)$. Naturally, given that relocation is costly, especially when it involves redundancy payments, if the firm was to know with certainty in $t = 1$ that it would wish to relocate in $t = 2$, it would have chosen 'foreign' instead of 'home' as its initial location. Therefore, relocation to 'foreign' is probabilistic in our model. So, when the firm decides to locate in 'home' in period one—in spite of the fact that it may relocate to 'foreign' in period two—it does so because its *expected* profits from choosing 'home' as its initial location exceed its *expected* profits from choosing 'foreign' as its initial location. In other words, the second condition for (h_1, f_2) to emerge as an equilibrium, which will be discussed in Sect. 2.2, is $E\pi(h_1) > E\pi(f_1)$.

2.1 Period two: the relocation decision

Backward induction requires us to look at the firm's decisions in period two first. Should the firm decide to relocate, it will incur the redundancy cost of laying-off workers in the original location and then the fixed set-up cost in the new location. As discussed above, for relocation to occur, the condition $\pi_2(h_1, f_2) > \pi_2(h_1, h_2)$ must hold. The profit function $\pi_2(h_1, f_2)$ is given by:

$$\pi_2(h_1, f_2) = (p_2 - c^f)q_2^f - \lambda^h q_1^h - \Phi^f, \tag{1}$$

where $(p_2 - c^f)q_2^f$ represents operating profits from producing in 'foreign' in period two and $\lambda^h q_1^h$ reflects the exit costs (in the form of redundancy payments) associated

[7] Given the cost function, a firm will not operate from multiple production locations at the same time. With alternative cost functions, partial relocation may occur, but the main message—employment protection makes relocation less likely—will be preserved.

with closing down production in 'home' $\left(q_2^h = 0\right)$. Note that q_1^h has been chosen optimally in period one; so, given q_1^h, period two exit costs associated with leaving the 'home' location increase in the employment protection parameter, λ^h. The optimal period-two output produced after relocation to 'foreign' is obtained by maximising Eq. (1) with respect to q_2^f. This implies $\partial\pi_2(h_1, f_2)/\partial q_2^f = 0$ and yields for the two possible states of period two demand:

$$q_2^f = (a - c^f)/2b \quad \text{if} \quad p_2 = a - bq_2 \tag{2a}$$

$$(a - c^f + \varepsilon)/2b \quad \text{if} \quad p_2 = a - bq_2 + \varepsilon \tag{2b}$$

Clearly, the larger the positive demand shock, the higher the output level and hence the operating profit $(p_2 - c^f)q_2^f$.

The alternative to relocating to 'foreign' is staying at 'home'. Profits from maintaining production at 'home' in $t = 2$ are given by:

$$\pi_2(h_1, h_2) = (p_2 - c^h)q_2^h - I\lambda^h(q_1^h - q_2^h) \tag{3}$$

where I is an indicator variable with $I = 1$ if $q_1^h 2^h$ and $I = 0$ otherwise. Note that the fixed costs associated with setting up a plant in 'home' have already been paid in $t = 1$ and hence do not appear in Eq. (3). The first-order condition that determines the optimal period-two production level in the "staying-at-home alternative" (h_1, h_2) is $\partial\pi_2(h_1, h_2)/\partial q_2^h = 0$, which implies for the two possible states of period-two demand:

$$q_2^h = (a - c^h + I\lambda^h)/2b \quad \text{if} \quad p_2 = a - bq_2 \tag{4a}$$

$$(a - c^h + \varepsilon + I\lambda^h)/2b \quad \text{if} \quad p_2 = a - bq_2 + \varepsilon \tag{4b}$$

Note that, whether $I = 0$ or $I = 1$, can only be determined after the optimal period-one output in 'home' (q_1^h) has been calculated (see Sect. 2.2).

From comparing Eqs. (1) and (3), it is obvious that the relocation condition, $\pi_2(h_1, f_2) > \pi_2(h_1, h_2)$, can be met only if period-two *operating* profits in 'foreign' exceed those attainable in 'home'—that is if $(p_2 - c^f)q_2^f > (p_2 - c^h)q_2^h$. Hence, relocation requires $c^f < c^h$.

When demand in $t = 2$ is the same as in the previous period, the firm will *a fortiori* choose the same location as in $t = 1$. However, when demand in period two is booming, the firm may consider relocation. Given $c^f < c^h$ and because maximised profits are convex in output, a positive demand shock in period two will widen the difference between operating profits attainable in 'foreign' and those attainable in 'home'.[8]

So, if such a positive demand shock occurs in period two, how large does it need to be to ensure that the firm will choose to relocate from 'home' to 'foreign'? Using Eqs. (1), (2b), (3) and (4b), the relocation condition $\pi_2(h_1, f_2) > \pi_2(h_1, h_2)$ can be written as:

[8] For the same reasons, a negative demand shock in period two will narrow the difference between operating profits attainable in 'foreign' and those attainable in 'home' and hence makes the 'foreign' location even less attractive in period two than in period one. Therefore, relocation will not occur when demand in period two falls (see Appendix).

$$\frac{\left(a-c^{f}\right)^{2}-\left(a-c^{h}+I\lambda^{h}\right)^{2}}{4b}+\frac{\varepsilon\left(c^{h}-I\lambda^{h}-c^{f}\right)}{2b}>\Phi^{f}+(1-I)\lambda^{h}q_{1}^{h} \qquad (5)$$

Equation (5) indicates that, if the period two demand shock (ε) is sufficiently high and provided that $c^h - I\lambda^h - c^f$ is positive (which it is, as it will be shown in Sect. 2.2 that $I = 0$), the difference in operating profit between the two locations, given by the left-hand-side of the expression, will exceed the total costs incurred from relocating to 'foreign'—represented by the right-hand-side of the expression. So, in our model, relocation may occur even if the level of employment protection does not change in period two.[9] However, what is important is that, given q_1^h, a high level of employment protection in 'home' may hinder relocation. A higher level of employment protection in 'home', by raising the exit costs associated with closing down production there, implies that a higher demand shock in period two is required for relocation to 'foreign' to occur. Finally, although employment protection levels tend to be stable over time because they can only change via legislation, note that if employment protection in h were to fall in period two, then relocation to f would be more likely.

In sum, other things equal, relocation will be more likely to occur (i) the larger is the positive demand shock (ε), (ii) the lower is Φ^f (which partly reflects the cost of FDI) and (iii) the lower is the level of employment protection in 'home' (λ^h), that determines the exit costs associated with relocation. Other things equal, a positive level of employment protection in 'home' may discourage relocation and effectively serve as a *'domestic anchorage'* device, thus hindering outward FDI. The anchorage effect of employment protection will also be conceivably stronger the higher are the FDI costs, i.e. a firm may be even more reluctant to face the occurance of the severance costs associated with relocation in the presence of high capital mobility barriers. Naturally, the possibility of relocation begs the question of whether the firm, knowing that it may prefer to produce in 'foreign' in the period two, will want to produce in 'home' in the first-period. We shall turn to this issue in the next subsection.

2.2 Period one: the initial location decision

In order to choose 'home' as its initial location, the firm's expected profit from doing so must exceed its expected profit from producing in 'foreign'—that is: $E\pi(h_1) > E\pi(f_1)$. Note that, if the firm chooses home as its initial location, despite the 'home' country's higher marginal production cost, it must be the case that $\Phi^h < \Phi^f$ (which will typically be the case if the cost of FDI is positive). However, in order to determine a sufficient condition for choosing 'home' in period one, we need to calculate $E\pi(h_1)$and $E\pi(f_1)$.

Let us first determine the firm's expected profits from choosing 'home' as its initial location ($E\pi(h_1)$). We have $E\pi(h_1) = \pi_1^{h_1} + E\pi_2^{h_1}$ with $\pi_1^{h_1} = (p_1 - c^h)q_1^h - \Phi^h$.

[9] In fact, changes in parameters other than those related to period two demand may cause relocation to 'foreign' in period two. For instance, one could consider uncertainty on the cost side. If the marginal cost of production in 'foreign' fell in period two with a given probability, then—for a large enough cost reduction—relocation from 'home' to 'foreign' would be a possibility.

Assume that condition (5) is met. Then, the firm that produces in 'home' in period one will relocate to 'foreign' if the positive demand shock in period two occurs. Hence, the firm's expected period two profits, given that it produces in 'home' in $t = 1$ and will relocate to 'foreign' in $t = 2$, if demand booms in period two are $E\pi_2^{h_1} = \rho\pi_2^{h_1h_2} + (1-\rho)\pi_2^{h_1f_2}$. The firm's optimal period one output is obtained by maximising total expected profit with respect to q_1^h, or $dE\pi(h_1)/dq_1^h = 0$, implying:

$$q_1^h = \frac{a - c^h - (1-\rho)\lambda^h - I\rho\lambda^h}{2b}. \tag{6}$$

From Eqs. (4a) and (6), it is clear that $q_1^h < q_2^h$, which implies that no redundancy costs will be incurred ($I = 0$) when the firm remains at 'home' in period two. Hence, Eqs. (4a) and (6) become, respectively:

$$q_2^h = \frac{a - c^h}{2b} \quad \text{and} \quad q_1^h = \frac{a - c^h - (1-\rho)\lambda^h}{2b}. \tag{7}$$

It is clear from the expression for q_1^h in (7) that period one production in 'home' is smaller the higher the degree of employment protection. Intuitively, if a firm chooses a location with a high degree of employment protection as its initial location, the initial size of its production plant is likely to be small, as with high λ^h, the initial production level is kept relatively low in order to limit future exit costs in the possible case of future relocation.

We now derive an expression for the firm's expected profits when it chooses 'foreign' as its initial location. Total expected profit from producing in 'foreign' is $E\pi(f_1) = \pi_1^{f_1} + E\pi_2^{f_1}$ with $\pi_1^{f_1} = (p_1 - c^f)q_1^f - \Phi^f$. If demand in period two is the same as in period one, the firm will stay in 'foreign' in the next period and will *a fortiori* do so when there is a boom in period two demand, since its operating profits in 'foreign' will be larger than in 'home' given the lower marginal cost of production in 'foreign'. Given that the initial production location is 'foreign', period two profits when producing in 'foreign' are $\pi_2(f_1, f_2) = (p_2 - c^f)q_2^f$. Hence, the firm's optimal period-two production level (implied by $\partial\pi_2(f_1, f_2)/\partial q_2^f = 0$) when demand in period two is the same as in period one, is $(a - c^f)/2$, while it is $(a - c^f + \varepsilon)/2$, if a demand boom occurs. Hence, expected profits in period two from producing in 'foreign', given that the initial location is 'foreign', are $E\pi_2^{f_1} = \rho\frac{(a-c^f)^2}{4b} + (1-\rho)\frac{(a-c^f+\varepsilon)^2}{4b}$.

Since there is no employment protection in 'foreign', the firm's optimal period one output, obtained by maximising total expected profit with respect to q_1^f, is simply given by:

$$q_1^f = \frac{a - c^f}{2b} \tag{8}$$

Using Eqs. (2b), (7) and (8) as well as the expressions for expected profits, the condition for the firm choosing 'home' as its initial location ($E\pi(h_1) > E\pi(f_1)$) becomes:

$$\Phi^h < \rho\left[\Phi^f - \frac{(a-c^f)^2 - (a-c^h)^2}{4b}\right] - \frac{(a-c^f)^2 - [(a-c^h) - (1-\rho)\lambda^h]^2}{4b} \quad (9)$$

So, the firm will—in spite of the possibility that it will relocate to 'foreign' in period two—choose to produce in 'home' in period one, if the fixed cost associated with setting up a plant in 'home' is sufficiently low. The right-hand-side of Eq. (9) specifies the maximum value for Φ^h, which we will denote by $\bar{\Phi}^h$. Other things equal, $\bar{\Phi}^h$increases in Φ^f, which reflects the cost of FDI—i.e. the more costly it is to set-up a plant in f and the more likely will the firm choose to locate in h in period one. *Ceteris paribus*, $\bar{\Phi}^h$ also decreases in λ^h, implying that at tighter employment protection regulations, the value of Φ^h consistent with the firm choosing 'home' as its initial production location will fall. In other words, a region or country with relatively high employment protection will be less attractive, other things equal, as an initial production location than a country with more flexible labour markets.[10]

To summarise, our simple theoretical model predicts that (i) firms are less likely to locate in countries with a high degree of employment protection, (ii) firms that do locate in countries with a high degree of employment protection will keep their plant, at least initially, relatively small and (iii) firms located in countries with a high degree of employment protection are less likely to relocate than those located in countries with a low degree of employment protection. A country with a higher employment protection will therefore be less attractive to inward FDI; once location has occurred, however, a high level of employment protection will make relocation less likely, thus acting as an '*anchor*' for the domestic industry. Clearly, the sensitivity of investment flows to employment protection will also depend on the extent of capital market integration, i.e. on the cost of FDI, captured here by the difference between the fixed set-up costs in the two locations. At a high FDI cost, a high employment protection differential in favour of f will be both less discouraging of location in h, and less encouraging relocation to f, thus strenghtening the '*anchoring*' effect of employment protection legislation.

3 Empirical analysis

In this section we estimate an empirical model of the determinants of outward FDI from 'home' country h to partner country f using panel data for OECD countries in order to provide empirical evidence related to the theoretical findings. While the theoretical discussion does not yield an empirically estimable reduced form equation it nevertheless gives clear guidance on how employment protection may impact on outward investment.

Inspired by the theoretical discussion we propose the following empirical specification:

---

[10] Of course, if the firm expected that the employment protection level in h were to fall in period two, then this would increase the attractiveness of h in period one as the firm's initial location.

$$\ln(FDI_{hft}) = \alpha + \gamma_1\lambda_{ht} + \gamma_2(\lambda_{ft} - \lambda_{ht}) + \gamma_3(\lambda_{ht} \times \delta_{hft}) + \gamma_4[(\lambda_{ft} - \lambda_{ht}) \times \delta_{hft}] + \gamma_5\delta_{hft} + \beta X_t + \varepsilon_{hft} \quad (5)$$

where λ_{ht} is a measure of employment protection (EP) in home country h at time t, $(\lambda_{ft} - \lambda_{ht})$ is the difference in employment protection between host and home country and δ_{hft} measures FDI costs between h and f. Other things equal, our theoretical analysis points to a negative relationship between $(\lambda_{ft} - \lambda_{ht})$ and the home country's outward investment, i.e. γ_2 is expected to be negative. The coefficient γ_1 captures the '*domestic anchorage*' effect described in the model and is also expected to be negative. The theory also suggests that FDI and its sensitivity to employment protection may depend on the level of investment costs. In order to capture this effect, we include interaction terms of our employment protection variables with a measure of investment cost, multiplying λ_{ht} and $(\lambda_{ft} - \lambda_{ht})$ by δ. Furthermore, δ is included on its own to control for differences in levels of investment costs.

The vector X captures a number of additional covariates that have been identified in the literature as potentially affecting the location of FDI. These are:

- the *level of partner country GDP*, to control for the market size of the host economy (see Culem 1988).
- the *level of home country GDP*, to control for the size of the home country, which determines the supply of FDI (Blonigen 1997).
- the *average wage in the partner country*, to control for differences in labour costs across countries (see Wheeler and Mody 1992).
- measures of *union density and wage coordination in the partner country*, to control for differences in unionisation and the wage bargaining structure—institutional features of labour markets that, as suggested by the theoretical literature (e.g. Leahy and Montagna 2000a), may influence firms' location decision.

The dependent variable is measured as real outward FDI stocks in US dollars; the data are taken from the OECD's *International Investment Statistics Yearbook*. Stock data are, in our view preferable to flows as the latter are short run measures which tend to fluctuate heavily, while the employment protection measures are likely to adjust only in the medium or long run. Hence, differences in FDI stocks across countries may be more likely than differences in flows to reflect inter-country employment protection differentials.[11]

The level of employment protection is difficult to measure as it includes a variety of components. We follow Görg (2005) and proxy the tightness of EP using an index of hiring and firing restrictions in a country. The index itself is constructed from extensive surveys of managers in 59 countries conducted by the *World Economic Forum*. In 1999, the *Global Competitiveness Report* reported that around 4,000 managers participated. In the survey, participants are asked to give a score

[11] An important shortcoming of the data for the dependent variable is that it does not allow us to distinguish new locations and relocations. Unfortunately we do not have data available that would enable such a distinction.

between 0 and 100 in response to a number of questions describing the overall business climate and competitiveness of the country in which the firm operates. The particular question for the index used here is: "*Hiring and firing practices are too restricted by government or are flexible enough*". We transformed this index so that the lower the index the more business friendly respondents judge these practices to be and, hence, the lower is employment protection. The index is available to us from 1986 to 1995.[12] We also provide a robustness check using a different index obtained from the OECD.

The cost of investment (δ) is a measure of the cost of capital for investments from home to partner country. It is defined as the required pre-tax rate of return based on the approach developed in King and Fullerton (1984).[13] The investment cost variable is also an index between 0 and 100, going from least to highest cost, as is the index for the degree of wage coordination in the partner country. The union density variable is defined as a country's share of workers that are unionised.[14] All of these variables, as well as the GDP data are taken from the OECD, while data on average wages per country are utilised from the UNIDO Industrial Statistics database.[15]

While the OECD FDI data are in principle available to us from 1980 to 2000, the employment protection index is only available for the period 1986–1995, thus constraining the time dimension of our empirical analysis to this period.

Table 1 reports summary data on a country's total inward and outward FDI stocks and its employment protection index for 1995, the last year of the analysis. The countries with the highest levels of employment protection among the OECD countries are Spain and Italy. At the other end of the spectrum are Denmark, Switzerland and the UK with very low levels of employment protection in 1995. At first sight, these data only point to a loose connection between FDI and employment protection. For instance, Germany shows high EP levels and relatively low inward and outward FDI stocks, which is in line with our theory: employment protection discourages inward FDI by reducing flexibility, but it also discourages outward FDI due to the domestic anchorage effect. The opposite goes for Canada, where low EP levels are correlated with high inward and outward FDI. However, the Netherlands, a country with a fairly high employment protection level, has relatively high stocks of both inward and outward FDI.

The nature of the relationship, however, cannot be adequately captured by these summary data. A better appreciation of the effects of employment protection on FDI stocks can be gained by estimating the empirical model in Eq. (5) using bilateral data. The results of the panel estimation, allowing for country-partner fixed effects to control for country-pair unobservable, are presented in Table 2 column (1) gives the results for an estimation that excludes the union and wage setting variables; these variables are added successively in columns (2) and (3). The estimations show

[12] Critics may argue that such an index is likely to be subjective. However, the perceptions of the managers of the firm as to the 'desirability' of a location are likely to play a crucial role in determining their decision.

[13] See OECD (1991) for a detailed description.

[14] See Elmeskov et al. (1998) for a discussion of the wage coordination and unionisation variables.

[15] All nominal variables are converted into real 1995 US dollars.

Table 1 FDI and employment protection, 1995

	Outward Stocks	Inward Stocks	EP
Australia	0.114	0.231	53.7
Austria	0.042	0.069	53.7
Belgium	0.209	0.452	64.6
Canada	0.159	0.200	39.0
Czech Republic			42.6
Denmark			19.6
Finland	0.107	0.062	54.2
France	0.099	0.091	59.2
Germany	0.094	0.076	58.2
Greece	0.000	0.003	56.7
Hungary	0.003	0.221	34.4
Iceland	0.024	0.024	30.6
Ireland	0.166	0.643	48.3
Italy	0.071	0.051	72.0
Japan			40.8
Mexico	0.007	0.130	47.4
Netherlands	0.373	0.262	63.4
New Zealand	0.122	0.371	29.3
Norway	0.140	0.125	53.0
Poland	0.001	0.060	43.5
Portugal	0.022	0.141	59.6
Spain	0.019	0.085	70.6
Sweden	0.232	0.114	61.4
Switzerland	0.364	0.177	22.1
Turkey	0.003	0.019	28.7
UK	0.223	0.172	27.1
USA	0.069	0.067	33.8

Reports FDI stocks divided by GDP

that the expected positive effect of the home and partner country market sizes on FDI is accurately reflected in the data. We also find a statistically significant negative coefficient on the average wage, in line with our priors. Again consistently with the received wisdom, a higher percentage of unionised workers in a country is negatively associated with inward FDI, as is our indicator of the degree of wage coordination in the partner country.

Turning to the employment protection variables, we firstly focus on the results in columns (1) to (3) where we estimated the model described in Eq. (5) excluding the interaction terms for γ_3 and γ_4. We find that a higher employment protection differential between the partner and the home country is negatively correlated with bilateral FDI stocks from home to 'foreign'. The fact that an employment protection differential in favour of the home country discourages outward FDI to the partner country is in line with our theoretical predictions and reflects the latter's relatively

Table 2 Regression results for outward FDI stocks (Dependent variable: ln FDI stocks from home to partner)

	(1)	(2)	(3)	(4)
Partner GDP	1.948 (0.102)***	1.741 (0.128)***	1.581 (0.128)***	1.497 (0.130)***
Home GDP	2.215 (0.095)***	2.373 (0.128)***	2.256 (0.127)***	2.189 (0.127)***
Partner labour cost	−1.313 (0.078)***	−1.350 (0.149)***	−1.060 (0.149)***	−0.932 (0.151)***
Home EP	−0.021 (0.004)***	−0.012 (0.004)***	−0.011 (0.004)***	−0.010 (0.004)***
EP differential	−0.007 (0.002)***	−0.006 (0.002)***	−0.002 (0.002)	−0.009 (0.003)***
Investment cost	0.930 (0.244)***	−0.270 (0.287)	−0.686 (0.296)**	−0.338 (0.379)
Union density		−1.355 (0.097)***	−1.354 (0.098)***	−1.359 (0.097)***
Wage coordination index			−0.005 (0.001)***	−0.005 (0.001)***
Home EP × investment cost				−0.003 (0.002)
EP diff. × investment cost				0.011 (0.002)***
Observations	2,491	2,201	2,201	2,201
R^2	0.89	0.90	0.90	0.91

Regression with country-partner fixed effects

Heteroscedasticity consistent standard errors in parentheses

* Significant at 10%; ** significant at 5%; *** significant at 1%

Regression includes constant term

lower labour market flexibility. We also find evidence that supports our conjecture of a domestic anchorage effect, as the level of employment protection in the home country is also negatively related to outward FDI. The expected negative impact of investment costs on FDI is only reflected in our data in the ‘fully specified’ model in column (3). Column (4) report results of estimations including the interaction terms of the employment protection variables with investment costs.[16] From our theoretical model we would expect negative coefficients on these terms, since the responsiveness of FDI flows to both a higher flexibility differential in favour of the home country and a higher level of home employment protection is likely to be higher (i.e. more negative) the larger is the investment cost (i.e. the lower the degree of capital market integration). We find that the interaction of home EP and investment costs is negative, yet statistically insignificant, while the interaction of the EP differential and investment cost is positive. While this is not fully in line with our theoretical predictions, the positive coefficient could be intuitively plausible and suggests that as investment costs rises, the deterring effect of the EP differential becomes less important for investors.

The results obtained from this analysis of the determinants of FDI stocks are thus broadly in line with our priors from the theoretical model. In order to examine the

[16] While the investment cost variable is defined as an index, the interaction terms are based on a dummy equal to 1 if investment costs are higher than the median. In preliminary regressions we also interacted the EP variables with the actual level of investment costs. However, this produced unsatisfactory results and is not pursued here. This suggests that there are important non-linearities in the relationship between EP and investment costs which are better captured by the dummy variable.

Table 3 GMM Regression results (Dependent variable: ln FDI stocks from home to partner)

	(1)	(2)
Partner GDP	0.445 (0.061)***	0.439 (0.060)***
Home GDP	1.002 (0.036)***	1.009 (0.037)***
Partner labour cost	−1.012 (0.325)***	−0.950 (0.328)***
Home EP	−0.040 (0.008)***	−0.036 (0.009)***
EP differential	−0.016 (0.006)***	−0.022 (0.007)***
Investment cost	−5.817 (0.448)***	−4.439 (1.035)***
Union density	−0.884 (0.156)***	−0.899 (0.159)***
Wage coordination index	−0.006 (0.002)***	−0.006 (0.002)***
Home EP × investment cost		−0.009 (0.007)
EP diff. × investment cost		0.010 (0.008)
Hansen test (p-value)	0.13	0.37
R-squared	0.42	0.42
Observations	1,392	1,392

EP variables are treated as endogenous. Instruments used are third and fourth lags of variables

Heteroscedasticity consistent standard errors in parentheses

* Significant at 10%; ** significant at 5%; *** significant at 1%

Regression includes constant term

robustness of our estimations we present two extensions to the analysis. The empirical analysis carried out thus far considers EP as an exogenous variable in the estimation, i.e. it takes it to be unrelated with the error term. We now relax this assumption, and endogenise the employment protection variable by estimating Eq. (5) using third and fourth lags of the EP variables as instruments. This model is estimated using a GMM estimator as suggested by Baum et al. (2003).[17] Table 3 presents the estimation results. We find that the coefficients on home EP and the EP differential are both negative and statistically significant as found before. While we find that the coefficient on investment costs is now also negative and significant, as predicted by the theory, the coefficients on the interaction terms are now in both cases statistically insignificant. Nevertheless, this estimation provides broad support for our theoretical prediction of home EP and the EP differential having negative effects on outward FDI, and points to the robustness of the results obtained in Table 2.

Another possible concern with our analysis thus far is the measurement of employment protection based on the index from the *Global Competitiveness Report* (GCR). Given the qualitative nature of this index, it is relevant to try to ascertain the robustness of our results to alternative measurements of EP. To this end, we use an alternative index of employment protection provided to us by the OECD. This index is based on measures of protection affecting the country's temporary and regular employment. More specifically, the indicator is constructed "based on an in-depth

[17] The GMM estimator is preferable to a standard IV estimator in the presence of heteroscedasticity. Our estimations suggest that first and second lags are not valid instruments and hence use third and fourth lags.

Table 4 Cross section regression comparing GCR and OECD index (Dependent variable: ln FDI stocks from home to partner)

	(1) GCR index	(2) GCR index	(3) OECD index	(4) OECD index
Partner GDP	0.485 (0.194)**	0.497 (0.196)**	0.638 (0.170)***	0.651 (0.168)***
Home GDP	0.970 (0.121)***	0.977 (0.123)***	1.134 (0.098)***	1.157 (0.100)***
Partner labour cost	−1.373 (0.641)**	−1.340 (0.634)**	−1.241 (0.579)**	−1.195 (0.566)**
Home EP	−0.093 (0.022)***	−0.090 (0.022)***	−0.029 (0.009)***	−0.016 (0.012)
EP differential	−0.049 (0.016)***	−0.053 (0.017)***	−0.021 (0.007)***	−0.021 (0.008)***
Investment cost	−2.166 (1.146)*	−1.417 (1.514)	−3.466 (1.115)***	−1.429 (1.535)
Union density	−0.800 (0.384)**	−0.811 (0.404)**	−0.940 (0.325)***	−0.964 (0.342)***
Wage coordination index	0.000 (0.005)	0.001 (0.005)	−0.000 (0.004)	−0.001 (0.004)
Home EP × Investment cost		−0.006 (0.009)		−0.018 (0.011)
EP diff. × Investment cost		0.009 (0.013)		0.003 (0.008)
Observations	211	211	207	207
R-squared	0.49	0.49	0.50	0.51

Cross-section OLS regression for 1989

Raw correlation between GCR and OECD index = 0.69, statistically significant at 1% level Heteroscedasticity consistent standard errors in parentheses

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

Regression includes constant term

review of existing regulations and laws affecting the hiring and firing of workers along the two dimensions of regular and temporary contracts" (Nicoletti et al. 1999, pp. 40–41). As with the GCR index used in our analysis, the OECD index takes on values between 0 and 100 from the least to the most restrictive.

Unfortunately, this index is only available for 1989 and 1998, thus thwarting its use in a panel context. Nevertheless, we can compare the *Global Competitiveness Report* (GCR) and OECD indices for 1989. For that year, the raw correlation of the indices is 0.69, statistically significant at the 1 per cent level—a fairly high level of correlation. To conduct a further check of the robustness of our results, we re-estimate Eq. (5) using cross-section data for 1989 and making alternative use of the GCR and OECD indices as measures of home EP and EP differential.[18] The results are reported in Table 4. Note that the results are strikingly similar to those obtained with the panel estimation—home EP and EP differential are negative and statistically significant, while the interaction terms are statistically insignificant in both cases.[19]

[18] Of course, the coefficients obtained from these estimations need to be treated with caution as they may be biased due to excluding country-partner unobservable. However, this bias works in the same direction for all estimations and still allows us to check whether there are differences in using the GCR or OECD indices.

[19] The magnitude of the coefficients is somewhat different. This is to be expected as the absolute values of the indices are not comparable. What we are interested in is the variation in the indices, however.

4 Conclusions

Consistent with our theoretical predictions, the empirical results of this paper suggest that: firstly, domestic levels of employment protection discourage outward FDI and act as an '*anchorage*' device for domestic industry, and secondly, employment protection differentials between foreign and home country are negatively related to FDI outflows.

Overall, the theoretical and empirical analysis in this paper suggests that the relationship between labour market rigidities and international investment flows is more complex than what is implied by the conventional wisdom. Some tentative but interesting policy conclusions can be drawn from our results. Given that employment protection can help to anchor domestic industry by discouraging relocation, industrialised countries with a large industrial base will be able to sustain high levels of firing costs. Developing countries with a small industrial base may instead have an incentive to pursue flexible labour market policies. More generally, this analysis points to the theoretical possibility of a strategic inter-temporal use of labour standards, whereby low employment protection could be used to attract inward investment to a given location and could then be subsequently raised to lock the investment in.[20]

Acknowledgments We are grateful to Dana Hajkova and Daniel Mirza for help with the OECD data and to David Greenaway, Dermot Leahy, Hassan Molana and an anonymous referee for helpful comments. We also gratefully acknowledge financial support from The Leverhulme Trust under Programme Grant F114/BF and the European Commission under Grant No. SERD-2002-00077.

Appendix

In this appendix, we extend the basic model developed in the text by incorporating the possibility of a negative demand shock. Now, there are three possible states for period two demand: with probability ρ, demand in $t = 2$ is the same as in $t = 1$; with probability θ period-two demand will fall, i.e. $p_2 = a - bq_2 - \eta$, with η (a constant parameter) denoting the fall in demand; the probability that demand in the period two will boom is now $1 - \rho - \theta$.

(i) **Period two**: **the relocation decision**

Equations (1)–(4b) remain valid, but we now have an additional expression for q_2^f and for q_2^h in the third possible state of period two demand, with:

$$q_2^f = (a - c^f - \eta)/2b \quad \text{if} \quad p_2 = a - bq_2 - \eta \tag{A.1a}$$

and

$$q_2^h = (a - c^h - \eta + I_\theta \lambda^h)/2b \quad \text{if} \quad p_2 = a - bq_2 - \eta \tag{A.1b}$$

I_θ is an indicator variable with $I_\theta = 1$ if $q_1^h > q_2^h\big|_{p_2 = a - bq_2 - \eta}$ and $I_\theta = 0$ otherwise. When demand in $t = 2$ is the same as in $t = 1$, the firm will choose the same

[20] See Leahy and Montagna (2000b) for a theoretical analysis of the strategic use of unionisation laws.

location in $t = 2$ as in $t = 1$; hence, no relocation will occur in that case. So, if period two demand is lower than demand in period one, the monopolist will a fortiori choose the same location as in period one (since maximised profits are convex in output). Therefore, relocation will only occur if the demand shock in period two is a positive one and hence Eq. (5) remains valid and is not altered by the possibility of a negative period two demand shock. Of course, the probability that relocation will happen is now $1 - \rho - \theta$ instead of $1 - \rho$.

(ii) **Period one**: **the initial location decision**

We first calculate $E\pi(h_1)$. When choosing q_1^h, the firm maximises $E\pi(h_1) = \pi_1^h + E\pi_2^{h_1}$, but now $E\pi_2^{h_1} = \rho\pi_2^{h_1h_2}\big|_{p_2=a-bq_2} + \theta\pi_2^{h_1h_2}\big|_{p_2=a-bq_2-\eta} + (1-\rho-\theta)\pi_2^{h_1f_2}$. The firm's optimal period one output, q_1^h, is now:

$$q_1^h = \frac{a - c^h - (1-\rho-\theta)\lambda^h - I\rho\lambda^h - I_\theta\theta\lambda^h}{2b} \tag{A.2}$$

From Eqs. (4a) and (6), it is clear that $q_1^h < q_2^h$ if $p_2 = a - bq_2$, hence $I = 0$. However, if $p_2 = a - bq_2 - \eta$, $q_1^h > q_2^h$ is possible, in which case $I_\theta = 1$ (from Eqs. 7, 8), if the negative shock is large enough. More specifically, $I_\theta = 1$ when $\eta > (2-\rho)\lambda^h$.[21] Then,

$$q_1^h = \frac{a - c^h - (1-\rho-\theta)\lambda^h - \theta\lambda^h}{2b} \quad \text{and} \quad q_2^h = (a - c^h - \eta + \lambda^h/2b. \tag{A.3}$$

We now derive an expression for $E\pi(f_1)$. We have $E\pi(f_1) = \pi_1^f + E\pi_2^{f_1}$, with $E\pi_2^{f_1} = \rho\frac{(a-c^f)^2}{4b} + \theta\frac{(a-c^f-\eta)^2}{4b} + (1-\rho-\theta)\frac{(a-c^f+\varepsilon)^2}{4b}$. The expression for q_1^f is given by Eq. (8). Using expressions (2b), (8) and (9) as well as the expressions for expected profits, the condition for the firm choosing 'home' as its initial location ($E\pi(h_1) > E\pi(f_1)$) is now[22]:

$$\begin{aligned}\Phi^h < (\rho+\theta)\Phi^f - \rho\left[\frac{(a-c^f)^2 - (a-c^h)^2}{4b}\right] \\ - \frac{(a-c^f)^2 - [(a-c^h) - (1-\rho-\theta)\lambda^h - \theta\lambda^h]^2}{4b} \\ - \theta\frac{(a-c^f-\eta)^2 - (a-c^h-\eta+\lambda^h)^2}{4b} = \bar{\Phi}^h\end{aligned} \tag{A.4}$$

We have $d\bar{\Phi}^h/d\lambda^h = \frac{-(1-\rho)(a-c^h-(1-\rho-\theta)\lambda^h-\theta\lambda^h)+\theta(a-c^h-\eta+\lambda^h)}{2b} < 0$ (since $\eta > (2-\rho)\lambda^h$). Hence, like in the basic model, we obtain that $\bar{\Phi}^h$ is lower for higher values of λ^h.

[21] If the negative shock is small enough, Eq. (A.1b) and (A.2) show that $q_1^h < q_2^h$ and hence $I_\theta = 0$, without making any qualitative changes to our analysis.

[22] If η is small enough so that $q_1^h < q_2^h$, then $I_\theta = 0$ and $\bar{\Phi}^h = (\rho+\theta)\Phi^f - \rho\left[\frac{(a-c^f)^2-(a-c^h)^2}{4b}\right] - \frac{(a-c^f)^2-[(a-c^h)-(1-\rho-\theta)\lambda^h]^2}{4b}$ with, once again, $d\bar{\Phi}^h/d\lambda^h < 0$.

References

Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). Instrumental variables and GMM: Estimation and testing. Working Paper No. 545, Boston College.

Bentolilla, S., & Bertola, G. (1990). Firing costs and labour demand: How bad is eurosclerosis? *Review of Economic Studies, 57*, 381–402.

Blonigen, B. A. (1997). Firm-specific assets and the link between exchange rates and foreign direct investment. *American Economic Review, 87*, 447–465.

Culem, C. G. (1988). The locational determinants of direct investments among industrialised countries. *European Economic Review, 32*, 885–904.

Dewit, G., Leahy, D., & Montagna, C. (2003). Employment protection and globalisation in dynamic oligopoly. CEPR Discussion Paper 3871.

Elmeskov, J., Martin, J., & Scarpetta, S. (1998). Key lessons for labour market reforms: Evidence from OECD countries' experiences. *Swedish Economic Policy Review, 5*, 205–252.

Garibaldi, P., Konings, J., & Pissaridis, C. (1997). Gross job reallocation and labour market policy. In D. Snower & G. de la Dehesa (Eds.), *Unemployment policy: Government options for the labour market*. Cambridge: Cambridge University Press.

Görg, H. (2005). Fancy a stay at the Hotel California? The role of easy entry and exit for FDI. *Kyklos, 58*, 519–536.

Haaland, J. I., & Wooton, I. (2002). Multinational investment, industry risk and policy competition. CEPR Discussion Paper 3152.

Haaland, J. I., Wooton, I., & Faggio, G. (2003). Multinational firms: Easy come, easy go? *FinanzArchiv, 59*, 3–26.

Javorcik, B. S., & Spatareanu, M. (2005). Do foreign investors care about labor market regulations? *Review of World Economics/Weltwirtschaftliches Archiv 141*, 375–403.

King, M. A., & Fullerton, D. (1984). *The taxation of income from capital*. Chicago: University of Chicago Press.

Leahy, D., & Montagna, C. (2000a). Unionisation, rent extraction and FDI: Challenging conventional wisdom? *Economic Journal, 100*, 80–92.

Leahy, D., & Montagna, C. (2000b). Temporary social dumping, union legalisation and FDI: A note on the strategic use of standards. *Journal of International Trade and Economic Development, 9*, 243–259.

Markusen, J. R. (2002). *Multinational firms and the theory of international trade*. Cambridge, MA: MIT Press.

Nickell, S. (1998). Unemployment, questions and some answers. *Economic Journal, 108*, 802–816.

Nickell, S., Nunziata, L., & Quintini, G. (2001). The beveridge curve, unemployment and wages in the OECD from the 1960s to the 1990s. CEP Discussion Paper 502, London School of Economics.

Nicoletti, G., Scarpetta, S., & Boylaud O. (1999). Summary indicators of product market regulation with an extension to employment protection legislation. OECD Economics Department Working Paper No. 226.

Nicoletti, G., Golub, S., Hajkova, D., Mirza D., & Yoo K.-Y. (2003). Policies and international integration: Influences on trade and foreign direct investment. OECD Economics Department Working Paper No. 359.

OECD (1991). *Taxing profits in a global economy*. Paris: OECD.

Wheeler, D., & Mody, A. (1992). International investment location decisions: The case of U.S. firms. *Journal of International Economics, 33*, 57–76.