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Leahy, Dermot; Montagna, Catia

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Unionisation and Foreign Direct Investment: Challenging Conventional Wisdom?

Dermot Leahy

and

Catia Montagna

University of Dundee

Unionisation and Foreign Direct Investment:

Challenging Conventional Wisdom?

Dermot Leahy

University College Dublin and CEPR

and

Catia Montagna

University of Dundee

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Abstract:

This paper investigates the effects of different degrees of wage setting centralisation on **(1)** the incentive of a MNE to locate in a host country, **(2)** the optimal level of investment it decides to commit to its foreign operation, and **(3)** the host country's welfare. Decentralised and centralised wage bargaining are considered. The nature of product market competition between the MNE and domestic firms affects results which cast doubt on some of the *conventional wisdom* on FDI. In particular, we show that: **(i)** it is not always welfare improving to attract inward FDI, and **(ii)** the MNE may prefer centralised to decentralised wage setting regimes.

Keywords: FDI, unionisation, strategic behaviour

JEL: F16, F23

[*] Dept. of Economics, University College Dublin, Belfield, Dublin 4, Ireland. Tel.:(+353)1-706 7620; e-mail DERMOT.M.LEAHY@.UCD.IE

[**] Dept. of Economics, University of Dundee, Dundee DD1 4HN, U.K. Tel.:(+44)1382-344845; e-mail C.MONTAGNA@DUNDEE.AC.UK

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1. Introduction

The last few decades have witnessed a substantial growth of foreign direct investment (FDI). As a result, increasing attention has been devoted in policy debates to the welfare consequences of FDI for the host country and to the factors affecting multinationals' choice of location. A consensus seems to have emerged around some commonly accepted views which form a *"conventional wisdom"* on FDI. Three of these conventional views are: **(1)** Inward FDI is welfare improving for a host country, regardless of the type of labour market institutions; **(2)** Multinational enterprises (MNEs) prefer decentralised firm level wage bargaining processes to centralised ones; **(3)** Governments should subsidise inward FDI, in particular in the presence of unionised labour markets.

The first of these *conventional wisdoms* concerns the welfare effects of FDI for the host country. Although different interest groups within an economy may hold conflicting views as to the desirability of inward FDI, it is probably appropriate to state that on balance governments see it as welfare improving[1]. Thus, increasingly, "international competitiveness" is not only meant to reflect the ability of a country to compete on international goods markets, but also its attractiveness to foreign MNEs.

The second *conventional wisdom* relates to the determinants of multinationals' choice of location, amongst which labour market characteristics and institutions are considered major factors. According to the emerging consensus, MNEs prefer flexible non-unionised labour markets and, when unionisation is in place, decentralised firm level wage bargaining processes over centralised ones. Despite ample empirical evidence (UN Investment Report, 1997) suggesting that labour costs are just one of the many considerations behind MNEs' location decisions, this view rests on the assumption that they are crucial in determining countries' ability to compete for FDI: by increasing labour costs, unionisation is detrimental to a country's attractiveness to MNEs. This type of argument has often been used in relatively highly unionised industrialised countries to endorse legislation aimed at limiting unions' power and deregulating the bargaining

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[1] Typical benefits associated with inward FDI are increased employment, technological externalities, emergence of new and/or more dynamic sectors, procompetitive effects on industry structure. Amongst its costs is the excessive competitive pressure on home firms which may force them out of business rather than stimulate their efficiency. Furthermore, as Zhao (1995) and Lahiri and Ono (1997) point out, the possible emergence of cross-hauling in FDI, may induce an "export of jobs" thus outweighing the creation of new jobs by the inward FDI.

process.

The third *conventional wisdom* is almost a corollary of the other two. The desirability of inward FDI suggests the need for subsidising it, in particular when unionised labour markets are likely to make a host country less attractive to foreign MNEs. It is in fact common practice for national governments to subsidise and to compete for inward FDI[2].

This paper attempts to evaluate the conventional wisdom outlined above in the context of unionised labour markets.

The interaction between labour market unionisation and FDI has received surprisingly little attention in the theoretical literature where the two have mostly been studied separately.   Imperfect competition and positive profits create incentives for strategic trade policy to attract and extract rents from MNEs, as for instance in Brander and Spencer (1987), Bond and Samuelson (1989) and Janeba (1996). The effects of trade on labour markets have been typically studied within the theory of distortions (e.g. Bhagwati and Srinivasan, 1983) or the political economy framework (Dinoupoulos, 1983). More recently, Brecher and Van Long (1989) analyse the impact of protection on employment and welfare in an open economy with a central union. Brander and Spencer (1988) and Santoni (1996) analyse the effect of unionisation and trade policies in a Nash-Cournot duopoly where a unionised home firm competes against a foreign firm. Huzinga (1993) and Naylor (1998) examine the effects of market integration within a unionised sector.   Very little work has been done on the relationship between labour market unionisation and FDI. Notable exception is Zhao (1995, 1998) where cross-hauling FDI is generated between two countries with imperfectly competitive product markets and unionised labour markets. Naylor and Santoni (1998) analyse the effects of union power and degree of substitutability between products on FDI.

Within the unionisation-FDI literature, our paper is the first of which we are aware to: **(1)** examine the effects of different degrees of union centralisation on FDI and welfare, **(2)** study the role of different modes of product market interaction between MNEs and domestic firms, **(3)** analyse the optimal policy towards FDI when unions extract rents from

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[2] Bond and Guisinger (1985) study the effects of regional incentive programmes on the location decisions of MNEs. Haaparanta (1996) analyses the effects of tax competition between two countries on the allocation of an exogenously given amount of FDI by a MNE between them.

MNEs, and **(4)** analyse the strategic use of capital investment by the MNE to affect the wage it faces[3]. The focus of our analysis may be especially relevant to Europe where labour markets are generally highly unionised but where the degree of centralisation varies greatly across countries (Freeman and Katz, 1995) and where countries are characterised by different patterns of inwards FDI (Barrel and Pain, 1997).

We consider two alternative wage setting regimes. The first is decentralised, with trade unions bargaining individually with each firm. The second is a centralised regime in which one single wage is set for an industry or group of industries. In the latter case, the wage setting process represents a link between the MNE and the domestic firms, even when direct product market competition between them is absent.

Our analysis shows that the results crucially depend on the nature of product market interaction between the MNE and host country's firms. We consider two situations. In the first there is no product market interaction, and the MNE will not compete with home firms either in the domestic or in any other market. This allows us to isolate the effects of wage determination on the host country's welfare and on the MNE's decisions. We subsequently allow for product market interaction, which could occur in either the domestic or in an export market. This is not an academic distinction but one which may be seen as reflecting the motives behind a MNE's decision to locate in a host country. When the latter is seen by the MNE as an export base, the absence of direct competition with domestic firms is a plausible assumption. This is more likely the smaller is the economic size of the host country relative to the MNE's export market. A typical example of this is Ireland: its high share of inward FDI, which could not be ascribed to the extent of its domestic market, has mainly occurred in sectors which did not have a significant presence of indigenous firms. If, however, the MNE is attracted by domestic sales, it is likely (particularly in relatively large industrialised countries) that it will face competition from the host country's firms

The model is developed in Section 2. Section 3 and 4 look at the alternative product market interaction cases, carry out welfare comparisons across different regimes and discuss the implications for policy towards FDI. Section 5 endogenises the level of capital investment of the MNE and analyses the government's optimal policy. Section 6 concludes the paper.

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[3] Bughin and Vannini (1995) were probably the first to highlight the rent -extracting role of unions with FDI. Their model, however, does not address any of these points.

2. The Model Set-up

Consider a model with a multinational which may set up in a host country where N symmetric domestic firms are already located. All firms (including the MNE) are unionised.

We model the interaction between agents as a three-stage game. In stage one, the MNE decides whether to locate in the host country. In stage two, unions choose the wage at which labour will be supplied to firms[4]. We consider two alternative wage setting regimes. The first is decentralised with the unions bargaining individually with each firm. In the second, the wage bargaining is concluded centrally and one wage is set for all firms in the country. In stage three, firms choose their output levels. Two types of product market competition are analysed: **(1)** the home firms and the MNE do not compete in the product market and the MNE exports all of its output; **(2)** domestic firms and the MNE all compete in the same market which may or may not be the home market itself.

In the absence of direct product market interaction between the MNE and domestic firms, the latter may sell in the home market or be exporters. For simplicity, in this case we shall also rule out competition between domestic firms. Thus, with decentralised wage setting there is no link between the home firms and the MNE. However, when bargaining is centralised, the wage setting process represents such a link. With direct product market competition, the MNE and the domestic firms are linked via the product market even with decentralised bargaining.

The MNE has a revenue function $R^*(y, D^*) = y p^*(y, D^*)$ where y and p^* are the MNE's output and price and D^* is the output of its competitors[5]. The revenue function for a typical home firm will be $R_i(q_i, D^i) = q_i p_i(q_i, D^i)$ where q_i and p_i are its output and price, and D^i is the output of all its competitors (this may include the multinational).

If the MNE locates it will hire labour at a wage w^*, set in stage two by the unions.

For a firm to prosper in a foreign environment, it will generally possess some firm specific advantages (Dunning, 1988). We assume this firm-specific advantage to consist of

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[4] The focus of our analysis is on comparing different wage setting regimes. To isolate their effect it is convenient to hold constant the relative bargaining power of the union. In this context, it is simplest to assume that unions are monopoly wage setters.

[5] This revenue function is general enough to encompass product differentiation. However, we shall only consider either homogenous goods, or maximum product differentiation, so that firms are in completely separate industries.

a higher labour productivity, resulting from technical superiority and/or higher capital intensity[6]. The MNE's unit labour input requirement is negatively related to its capital investment (K) which we initially take to be exogenous. The profit function of the multinational is then:

$$\pi^* = R^*(y, D^*) - w^* L^*(y, K) - F \tag{1}$$

where L^* is the labour employed in its host country's operation and F is a fixed cost which may include the cost of capital.

The typical home firm's profit function is:

$$\pi_i = R_i(q_i, D^i) - w^i L^i \tag{2}$$

where $L^i = q_i$ is labour employed.

The firm-specific unions' utility functions for the the multinational and the typical home firm are respectively:

$$U^* = (w^* - \overline{w})L^* \tag{3}$$

and

$$U^i = (w_i - \overline{w})L^i \tag{4}$$

where $\overline{w}$ is the constant wage paid to non-unionised workers[7].

The national welfare function is given by:

$$W = CS + U^* + \sum_i^n (\pi_i + U^i) \tag{5}$$

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[6] Evidence suggests that MNEs typically have a higher productivity than domestic firms (e.g. Davies and Lyons, 1992).

[7] We assume that employment and wages have the same weights in the unions' utility functions. One could easily allow for different weights, but this would not yield many additional insights in this context.

where consumer surplus (*CS)* is zero when firms only export and is positive when firms sell to home consumers.

The stage-three first-order conditions for the choice of output of the multinational and the typical home firm are respectively given by

$$R_y^* - w^* L_y^* = 0 \tag{6}$$

and

$$R_{q_i} - w^i = 0 \tag{7}$$

where by assumption $L_y^* \leq L_{q_i}^i = 1$.

In stage two the unions choose wages to maximise total labour rents. We assume a right-to-manage model where firms retain discretion over employment decisions

First assume that wages are set on a decentralised basis by unions which are monopolists at the firm level. In this case the particular wage in the multinational sector will be $w^* = w^m$. The first-order condition for the union in the multinational is:

$$\frac{\partial U^*}{\partial w^m} = (w^m - \overline{w}) \frac{\partial L^*}{\partial w^m} + L^* = 0$$

(8)

and that for a typical domestic firm's union is :

$$\frac{\partial U^i}{\partial w^i} = (w^i - \overline{w}) \frac{\partial L^i}{\partial w^i} + L^i = 0 \tag{9}$$

Instead, with centralised bargaining, a single wage is set to maximise the sum of the individual unions' utilities:$V = U^* + NU$. This implies the following first order condition:

$$\frac{dV}{dw^c} = (w^c - \overline{w})\frac{\partial \Lambda}{\partial w^c} + \Lambda = 0 \tag{10}$$

where $w^c = w = w^*$ is the centralised wage and $\Lambda \equiv NL^i + L^*$.

In stage one of the game, the MNE will locate if its profit π^* is greater than a reservation profit $\overline{\pi}$ which is assumed to be exogenous and to reflect the profit opportunities of locating elsewhere. The exogeneity of $\overline{\pi}$ implies that the host country is small in the market for FDI.

3. No Product Market Interaction

In the absence of product market interaction between the multinational and domestic firms, the MNE is assumed to export all its output.

3.1. Decentralised wage setting

With decentralised bargaining, the equilibrium values of wages are implicitly given by (8) and (9).

To obtain some clearer results we will often adopt specific functional forms. In particular we shall impose the following assumptions: **(A.1)** Linear demands:

$$p^* = a - \frac{1}{s^*}y, \qquad p^i = a - \frac{1}{s_i}q_i \tag{11}$$

where s_i represents a typical home firm's market size, and s^* is similarly defined for the multinational. Symmetry among domestic firms implies that $s = s_i \;\; \forall \;\; i$ (but s may differ from s^*). **(A.2)** The MNEs' labour input requirement is $\alpha(K) = L^*/y$, with $\alpha'(K) < 0$. Given A.1 and A.2 in (8) and (9) we obtain:

$$w^m = \frac{1}{2}\left(\overline{w} + \frac{a}{\alpha}\right)$$

(12)

8

and

$$w = \frac{1}{2}(\overline{w} + a)$$

(13)

where w is the symmetric domestic firms' wage. Given that $\alpha \leq 1$, it is obvious that $w^m \geq w$: the higher relative labour productivity of the multinational enables its union to extract a higher wage than that extracted from domestic firms[8].

3.2. Centralised wage setting

In the centralised bargaining case, the equilibrium wage is implicitly given by (10). With specific functional forms A.1 and A.2, the centralised wage is

$$w^c = \frac{1}{2}\left[\overline{w} + \frac{a(\alpha + \Gamma)}{\alpha^2 + \Gamma}\right]$$ **(14)**

where $\Gamma \equiv Ns/s^*$ is an inverse measure of the MNE's market size relative to the total of the market sizes of domestic firms and reflects the relative labour market importance of the multinational sector from the point of view of the unions. Equation (14) implies $\frac{dw^c}{d\Gamma} < 0$ that is, the greater the relative market share of the MNE the higher is the centralised wage. Furthermore, it is easy to show that w^c lies strictly between the two decentralised wages (w^m and w^i), as illustrated in Figure 1 below. Thus, the centralised wage is always lower than the decentralised wage paid by the multinational, because even in the absence of product market interaction, centralisation generates a labour market link between the MNE and the domestic firms. Taking this link into account, the unions choose to limit rent extraction from the MNE, in order to maintain employment in the less efficient domestic sector. This also explains the seemingly paradoxical impact of a higher capital investment of the MNE on the centralised wage. Although it raises the potential for rent extraction from

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[8] This is consistent with the evidence that MNEs typically pay higher wages than their domestic

the MNE, a higher K does not always result in a higher centralised wage. It can be shown

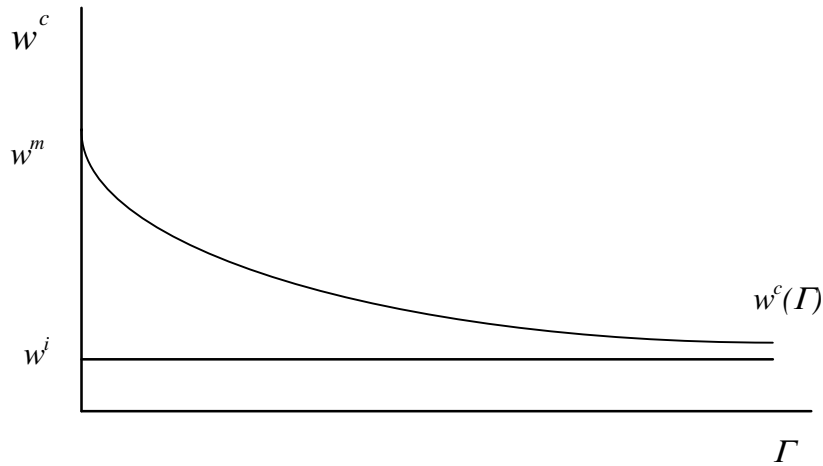that if α is sufficientlyhigh $\dfrac{dw^c}{dK} < 0$ [9].

Figure 1: The centralised wage without product market interaction

3.3. Welfare and profits: the linear case

It is commonly argued that FDI is welfare improving for the receiving country. To assess this view we shall evaluate the *"welfare value"* of the MNE to the host country, defined as the ceteris paribus difference between the levels of welfare achieved with and without the MNE.

The conventional wisdom holds without market interaction, when the *"welfare value"* of FDI is positive regardless of the type of wage setting. It is easy to show that $W^j - W_a > 0$ for $j=d,c$ where the superscript j refers to the wage setting regime and the subscript a refers to the absence of the MNE[10]. The welfare value, however, is lower under centralised than under decentralised wage setting, because rent extraction from the MNE is lower with wage centralisation and there are negative spill-over effects of the higher centralised wage on domestic firms' profitability. It follows that the actual welfare level is higher under decentralised than under centralised wage setting (i.e. $W^d > W^c$).

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counterparts (e.g. Driffield, 1996).
[9] Unions face a trade-off between wage and employment. A high w^c will damage employment not only in the MNE but also in the domestic sector. To protect employment, the unions may choose to reduce the wage. This would not occur in the decentralised case where the domestic sector is not a concern for the MNE's union.

The commonly held view that MNEs prefer firm-level wage setting processes to centralised ones is not supported by our analysis in the absence of direct product market competition with domestic firms, given that $w^m > w^c$ implies higher MNE's profits under centralised wage setting. Hence, a divergence of interests emerges between the MNE and the host country's government, with centralised wage setting making entry more attractive to the MNE but leading to lower welfare levels.

The policy implication of this analysis is that when the MNE and the domestic firms do not directly compete with each other in the product market, it is desirable for a host country's government to attract inward FDI. In this case, the government will be willing to pay a lump-sum location subsidy up to the *"welfare value"* of the MNE. Clearly, the subsidy, which would be higher under decentralised wage setting, would only be required if $\pi^* \leq \bar{\pi}$.

4. Product Market Interaction

We will now allow for product market competition between the multinational and the domestic firms. Assuming that firms produce an identical commodity, the industry's inverse demand function is given by *p=p(Q+y)* where $Q = \sum_{i}^{N} q_i$. Hence, in the MNE's revenue function $D^* = Q$, and in the revenue function of the typical home firm $D^i = y + \sum_{j \neq i}^{N} q_j$.

4.1. Decentralised wage setting

In the decentralised bargaining case, unions play Nash so when a typical home union *i* chooses its wage w^i it takes as given w^m and the wages set by all other domestic unions (w_{-i}). Symmetry implies that all domestic firms will face the same equilibrium wage (i.e. $w^i = w$, $\forall i$). Thus, using (8) and (9), we obtain the reaction functions:

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[10] Given the absence of market interaction, W_a is identical under the two wage regimes.

$$w^m = \mu^*(w, K)$$

$$w = \mu(w^m, K)$$

(15)

which define an equilibrium in wages. The analysis of the product market interaction case is unwieldy for general functional forms. In order to develop the intuition we focus on the linear demand function $P=a-b(Q+y)$ (assumption **A.3**). A.2 and A.3 imply positively sloped wage reaction functions.

It is straightforward to show in the linear case that, although $\dfrac{dw^m}{dK}>0$, the MNE's marginal cost $c^m = \alpha(K)w^m$ falls in K.

Figure 2 plots the locus of the multinational's marginal cost as a function of the marginal cost of domestic firms (MM) and the locus of the home firms' marginal cost as a function of the MNE's (HH).

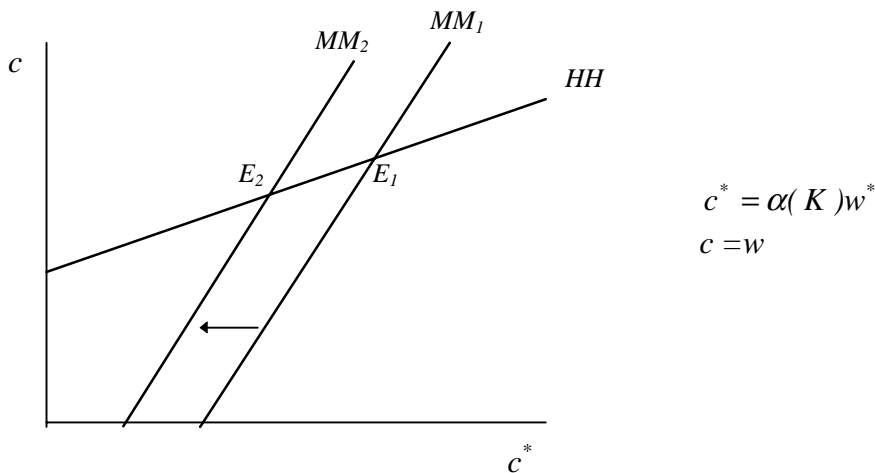**Figure 2: Effect of an increase in K on the marginal costs of the MNE and of a typical home country's firm.**

An exogenous increase in K shifts the MM curve to the left and this results in a fall in both c^* and c (c^* falls despite the fact that when K rises the union can extract higher wages). This improves the MNE's cost competitiveness relative to that of domestic firms and forces

domestic firms' unions to accept a lower wage[11].

4.2. Centralised wage setting

Under centralised bargaining the equilibrium wage is obtained from (10). Given A.2 and A.3, it will be

$$w^c = \frac{1}{2}\left[\overline{w} + \frac{a(\alpha + N)}{\alpha^2(N+1) + 2N(1-\alpha)}\right]$$

(16)

Contrary to the non market interaction case where w^c always lies below w^m, when the MNE competes with domestic firms in the product market we have $w^c > w^m$ for sufficiently large N and α. This is due to cooperative behaviour by the centralised unions which, by internalising product market externalities, set a higher wage[12].

4.3. Welfare and profits: the linear case

With market interaction, when looking at the effects of inward FDI on the host country's welfare, it is important to distinguish between the cases in which firms do and do not sell in the domestic market.

4.3.1. No domestic sales When firms are exporting only, the *"welfare value"* of inward FDI is negative under both decentralised and centralised wage settings, at least for $N>1$ (i.e., $W^j - W_a^j < 0$ for $j=d,c$). This is because the introduction of a new (foreign) firm into the export sector of the economy has a negative effect on the terms of trade[13]. At low N and high α the welfare costs of a MNE entering the export sector are greater under

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[11] In the linear case it is straightforward to show that an increase in K commits the MNE to a higher output and reduces its rivals' output. The effect on q operates directly, via product market competition, and indirectly via the wage setting process. The first effect is negative and will dominate the second which is positive.

[12] As in the no market interaction case, dw^c/dK will be negative for sufficiently large N and small α.

[13] Of course, if the MNE was already exporting into the foreign market, FDI would not introduce a new competitor and the welfare losses to the host country would be lower than here. The exact effect of this on welfare would depend on the cost competitiveness of the MNE's operation outside the home country. We ignore this possibility here because our concern is with cross comparisons between centralised and

decentralised bargaining, but this is reversed when the MNE is very productive (α low), in which case the much higher centralised wage has serious negative consequences for the profitability of domestic firms.

Having considered the welfare values ($W^j - W_a^j$), we turn to the discussion of welfare levels in order to determine the government's preferred bargaining regime, in the presence of FDI. We find that $W^d < W^c$ (for sufficiently large α and N). This is because in this case $w^c > w^m$ and the higher centralised wage would act like an export tax: it yields rents to domestic residents (the unions) and it reduces output through an increase in the export price, moving the economy towards the monopoly output level. Despite the fact that $w^c > w^m$, it is straightforward to show that the MNE prefers to locate in the host country under centralised rather than under decentralised wage setting (except for α very close to unity), because in this case the higher centralised wage hurts its host country's rivals more than itself. Hence, for sufficiently large α and N a congruence of interest applies between the MNE and the government, with both preferring the centralised wage setting regime.

4.3.2. Firms sell domestically   When firms are selling on the home market, the pro-competitive effect of the extra firm benefits consumer surplus[14]. Nevertheless, the possibility of welfare gains is normally restricted to the decentralised wage setting case, with the *"welfare value"* of inward FDI being typically negative under wage centralisation, particularly for low N and low α. This is because the negative effects of the MNE on home firms via the centralised wage outweighs any gains to consumers.

Turning now from welfare values to welfare levels, we can show that $W^d > W^c$. With domestic sales, the *"tax-like"* effect of the higher centralised wage always results in welfare being higher under decentralised than under centralised wage setting. Thus, in contrast to the case in which firms export only, a conflict of interest between the MNE and the host country government would normally arise.

4.3.3. The centralised firm specific wage setting   It is worth noting that the centralised wage setting process considered so far assumes that the centralised union sets a

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decentralised wage settings.

single wage for all firms. However, the existence of labour productivity gaps between firms, may encourage unions to cooperatively set different wages for different firms. Given the assumed symmetry of domestic firms, this would imply the setting of a single wage for the domestic firms and a different wage for the MNE. With no market interaction, this case collapses into the decentralised wage setting regime. With market interaction, the centralised union will exploit the higher productivity of the foreign firm by setting a MNE-specific wage which exceeds that paid by the host country's firms. This higher wage implies that the welfare value of the MNE would typically be positive when firms compete in the domestic market. This is in sharp contrast to the standard non-discriminatory centralised wage setting regime discussed above. Inward FDI would still typically be welfare reducing when firms compete in an export market (at least for sufficiently large α). The losses, however, would be smaller than in the decentralised and standard centralised regimes.

4.3.4. Comparison of market interaction with no-market interaction Except (**i**) in the "centralised firm specific wage setting" case under market interaction, and (**ii**) when its productivity advantage is extremely small, the MNE will prefer a centralised wage setting regime (with and without market interaction), thus contradicting one of the conventional wisdoms mentioned in the introduction.

With respect to the welfare value of inward FDI, we find that direct product market competition makes welfare losses from inward FDI more likely, because the MNE will capture market shares from the indigenous firms, thus reducing their profits. This will have a direct adverse effect on welfare, not compensated by the entrant's profits which are repatriated. The fall in welfare will often be larger under wage centralisation because of the additional externality on domestic firms generated by the common industry wide-wage.

The overall policy implication of these results is that there are circumstances in which the government would prefer to prevent entry, unless it could raise a location tax at least equal to the negative *"welfare value"* of FDI.

4.3.5. A note on the employment effects of FDI One of the reasons why governments encourage inward FDI is its supposedly positive employment effects to the host country.

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[14] This pro-competitive benefit would be lower if the MNE already exported to the home market.

Although we do not explicitly take account of employment effects in our welfare function in (5), it still may be interesting to consider the effect of the entry of the foreign MNE on the host country's employment[15]. It is straightforward to show that without market interaction, inward FDI increases employment regardless of the bargaining regime. Note however that, due to the negative externality that the MNE's entry has on home firms under centralised wage setting, $(\Lambda^d - \Lambda^d_a) > (\Lambda^c - \Lambda^c_a)$, where Λ^j and Λ^j_a $(j=d,c)$ are total employment with and without the MNE respectively. With market interaction, the negative externality on home firms of inward FDI will reduce the gains in terms of employment: $(\Lambda^d - \Lambda_a) < 0$ for sufficiently small α and large N, and $(\Lambda^c - \Lambda_a) < 0$ unless α is very close to unity.

5. Capital Investment and Policy

So far we have assumed an exogenous level of the MNE's capital investment in the host country. An important dimension of FDI, however, concerns the level of capital the MNE decides to commit to its foreign operation. As is clear from the analysis carried out so far, the amount of capital invested, by determining the cost advantage of the MNE over domestic firms, affects the unions optimal policy. In this section we endogenise the MNE's optimal investment decision and we analyse how it is affected by the different bargaining regimes. In order to isolate this issue, in the first instance we shall not model the location decision of the MNE[16]. This will subsequently be added to the model. Furthermore, we shall allow for the host country's government to be policy active towards the MNE by optimally choosing a capital subsidy. Our aim is to analyse how the government's optimal policy is affected by the nature of the wage setting process.

In order to address the issues outlined above, we now modify the structure of the game discussed in the previous sections. We shall model the interaction between agents as a four stage game. In stage one, the government chooses the capital subsidy σ. In stage two, the multinational chooses to invest a level capital K. In stage three, the unions set the wage under either centralised or decentralised bargaining and in stage four firms make their output decisions. As before, we shall consider two types of product market competition:

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[15] Of course, the welfare function could be easily modified to give a positive weight to employment.

[16] This situation can be thought of as one in which either the MNE has already made its location decision

market interaction and no-market interaction. Hence, the last two stages of the game correspond to the last two stages analysed in the previous sections. Since these have already been discussed, in what follows we shall confine our attention to stage one and two.

5.1. No product market interaction

In stage two of the game the MNE chooses the level of capital investment in the host country by maximising the following profit function with respect to K

$$\pi^* = R^*(y, D^*) - w^* L^* - \Psi(K) + \sigma K \tag{17}$$

Compared to the profit function in (1), equation (17) contains an additional term reflecting the total subsidy received by the MNE (σK). Also, the fixed cost F has been replaced by the total cost of capital $\Psi(K)$. The first order condition is:

$$\frac{d\pi^*}{dK} = -\{ w^* L_K^*(K, y) - (\sigma - \psi) \} - L^* \frac{dw^*}{dK} = 0 \tag{18}$$

where $\psi \equiv \frac{d\Psi(K)}{dK}$ is the marginal cost of capital. The term in chain brackets represents the non-strategic effect of capital investment. If wages were exogenous, this term would be set equal to zero and the firm would choose the cost minimising level of K. Instead, the MNE must now take account of the strategic effect of its investment on the union wage, given by the last term of the right-hand-side of equation (18). The sign of this term will differ depending on the nature of the wage setting process.

When wages are set at the firm level, $\frac{dw^*}{dK} = \frac{dw^m}{dK}$ will be positive if $\frac{\partial^2 U^*}{\partial w^m \partial K} > 0$, which we could take to be the "normal" case. In the linear case, it is easy to see that $\frac{dw^m}{dK} > 0$. In that case, it therefore follows from this that MNE will strategically underinvest in K to keep the wages down. As far as we know this is the first time that this strategic incentive to under-engage in FDI has been isolated: it is not just high wages that deter FDI,

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or where its profit constraint is not binding.

but if wages rise in K this too can deter a high investment level.

With wage centralisation, $\dfrac{dw^*}{dK} = \dfrac{dw^c}{dK}$ will be positive if $\dfrac{\partial^2 V}{\partial w^c \partial K} > 0$. However,

as was previously discussed, even in the linear case this condition may not hold: a higher K will increase the potential for rent extraction, but the resulting higher wage will damage employment opportunities not only in the MNE but also in the less efficient domestic sector. Therefore circumstances may arise where unions choose to reduce the wage to increase employment. Hence, under centralised bargaining, even in the linear case, the MNE may over or underinvest in capital, depending on the effect of its investment on the wage.

In the first stage of the game, the government chooses the capital subsidy to maximise domestic welfare. The total welfare function now includes the total subsidy bill and is given by:

$$W = CS + U^* + \sum_{i}^{n} (\pi_i + U^i) - \sigma K \tag{19}$$

With decentralised unions, we obtain the following optimal subsidy:

$$\sigma_{NI}^{d} = -\frac{K}{dK/d\sigma} + (w^m - \overline{w}) \frac{\partial L^*(w^m, K)}{\partial K} \tag{20}$$

where the subscript *"NI"* and the superscript *"d"* indicate "no market interaction" and "decentralised wage setting" respectively. The two terms on the right-hand-side of (20) represent the two rent extraction motives for the government subsidy/tax policy. The first is a direct effect through taxing the multinational firm's capital and is negative. The second is indirect and stems from the unionisation of the labour market (this term clearly equals $\partial U^*(K, w^m)/\partial K$). This term occurs because the government wishes to raise employment in the multinational sector when there are rents to be extracted there. If this is negative, so that an increase in K reduces employment, this effect works towards a tax. It is straightforward to show that in the linear case this must hold.

In the centralised case, the optimal subsidy will be given by:

$$\sigma_{NI}^{c} = -\frac{K}{dK/d\sigma} + (w^{c} - \overline{w})\frac{\partial L^{*}(w^{c},K)}{\partial K} - Nq\left\{\frac{M}{N}p'(q)\frac{dq}{dw^{c}} + 1\right\}\frac{dw^{c}}{dK}$$ (21)

Clearly the first two terms on the right-hand-side of (21) have the same interpretation as in equation (20) above, though the second of these terms may not have the same sign. The last term captures two additional interrelated effects that arise in the centralised bargaining case. The first is an effect on consumer surplus which arises when $M \leq N$ of the domestic firms sell at home. The second gives the home producer surplus net of union rent[17] and captures the link between the MNE and the domestic firms generated by the centralised wage. If $\frac{dw^{c}}{dK} > 0$ this final term is negative and works against a subsidy. This is because the subsidy, by increasing K and thus w^{c}, reduces total surplus (consumer surplus, plus home producers surplus, plus union rents) in the domestic sector.

Equations (20) and (21) suggest that σ_{NI}^{d} is presumptively greater than σ_{NI}^{c}. With centralised wage setting, the negative spill-over effect on domestic firms' profitability of a higher subsidy-induced capital investment would be taken into account by the government.

5.2. Product market interaction

When competing directly with the host country's firms on the product market, the MNE's optimal choice of capital investment in stage two of the game will be determined by the following first order condition:

$$\frac{d\pi^{*}}{dK} = -\{w^{*}L_{y}^{*} - (\sigma - \psi)\} - L^{*}\frac{dw^{*}}{dK} + R_{D^{*}}\frac{dD^{*}}{dK} = 0$$ (22)

Compared to (18), (22) contains an additional term $\left(R_{D^{*}}^{*}\frac{dD^{*}}{dK} = R_{Q}^{*}\frac{dQ}{dK}\right)$ which captures the effects on rivals' output of an increase in capital investment through both the product

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[17] In the normal case the subsidy raises w^{c}. This worsens the labour market distortion and therefore reduces domestic welfare.

and the labour markets and therefore represents the strategic effect of K on domestic firms' output. If this term is positive[18], the multinational over-invests in capital in order to gain a strategic advantage over the domestic firm.

With decentralised wages, $\dfrac{dw^*}{dK} = \dfrac{dw^m}{dK}$. When this is positive, as was shown to happen in the linear case, the multinational will under-invest in capital in order to keep the union wage down. When the wage is centralised, $\dfrac{dw^*}{dK} = \dfrac{dw^c}{dK}$ which may not be positive even in the linear case. Thus, with centralised wage bargaining the MNE may under or over invest.

The optimal subsidy with decentralised wage setting is given by

$$\sigma_I^d = -\frac{K}{dK/d\sigma} + (w^m - \overline{w})\left\{\frac{\partial L^*(w^m, w, K)}{\partial K} + \frac{\partial L^*(w^m, w, K)}{\partial w}\frac{dw}{dK}\right\}$$
$$+ N(w - \overline{w})\frac{dq}{dK} + N\left[(N-1)\frac{dq}{dK} + \frac{dy}{dK}\right]R_D + \frac{d(CS)}{dK}$$

(23)

where the superscript *"I"* indicates "product-market-interaction". As in the no-market-interaction case, the first term of (23) captures the incentive to tax K and reflects the direct cost to the government of subsidisation. This term, therefore, works against a subsidy. The second term, within chain brackets, reflects the impact of a capital increase on the MNE's level of employment. It consists of a direct effect at constant wages (present even without market interaction) and an indirect effect which works through the rivals' wages; the former may be positive or negative, depending on which of the productivity or output effects of a capital increase dominates; the indirect effect will typically be negative, thus working towards a tax. The third term captures the effects of a policy induced change in K on the domestic sector's employment and union rents. This can be written as:
$(w - \overline{w})\dfrac{dQ}{dK} = \left[(w - \overline{w})\dfrac{\partial Q}{\partial K} + (w - \overline{w})\dfrac{\partial Q}{\partial w^m}\dfrac{dw^m}{dK} - Q\dfrac{dw}{dK}\right]$ where the first two terms on the right hand side represent the direct and indirect effects (working through w^m). The last

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[18] This term is likely to be positive with strategic substitutes.

term represents the impact of *K* on *w* and thus on home producer surplus net of union rents. This overall effect is also likely to be negative. The fourth term in (23) is new and captures changes in domestic firms' profitability resulting from changes in *K*. This term is likely to be negative and therefore works towards a tax. If the multinational sells its product on the domestic market, the last term of equation (23) will exist and reflect the effect of the capital subsidy on consumers' surplus. This term is typically positive.

The optimal subsidy under wage centralisation will be given by:

$$\sigma_I^c = -\frac{K}{dK/d\sigma} + (w^c - \overline{w})\frac{\partial L^*(w^c, K)}{\partial K}$$
$$+ N(w - \overline{w})\frac{dq}{dK} + N\left[(N-1)\frac{dq}{dK} + \frac{dy}{dK}\right]R_D + \frac{d(CS)}{dK}$$

(24)

The first two terms of (24) have the same interpretation as the first two terms on the right-hand-side of (23). The third can now be written as: $(w^c - \overline{w})\frac{dQ}{dK} = \left[(w^c - \overline{w})\frac{\partial Q}{\partial K} - Q\frac{dw^c}{dK}\right]$ whose terms have similar interpretation as those in (23). In particular, the last one captures the effect of changes in the centralised wage of domestic firms' producer surplus net of changes in the domestic sector's union rents. An increase in w^c leads to a transfer of rents from the domestic firms to the unions. However, the fall in firms' rents exceeds the gain in unions' rents. The final two terms in (24) have the same interpretation as those in (23).

From equations (23) and (24) we are less likely to get $\sigma_I^d > \sigma_I^c$ than to get $\sigma_{NI}^d > \sigma_{NI}^c$ from equations (20) and (21). One of the reasons for this is that we are more likely to get $\frac{dw^c}{dK} < 0$ which implies that a subsidy has positive benefits on both producers' and consumers' surplus.

In general, a positive capital subsidy is less likely with market interaction than without. The principal reason for this is the negative effect of a higher *K* on the MNE's domestic rivals' profitability.

If the MNE's location decision is subject to a binding profit constraint $(\pi^* > \overline{\pi})$,

the government maximises the lagrangian $L = W + \lambda(\pi^* - \bar{\pi})$. The resulting subsidies are $\hat{\sigma}_k^j = \sigma_k^j + \lambda K$, *(j=d,c; k=NI,I)*. The extra term *(λK)>0* will work towards a subsidy. Clearly, when the constraint is binding, the capital subsidy plays a role analogous to the location subsidy examined in Section 5. The government will want to encourage the MNE's only if its *"welfare value"* is positive. As we have seen in the previous section, circumstances may exist in which this welfare value may not be positive.

In this section we have endogenized the MNE's capital choice and explored the optimal policy towards foreign capital investment. The strategic effect of the MNE's investment on the wage is crucial in determining both the MNE's investment decision and the government's optimal policy. In the decentralised wage-setting case, a higher level of K raises the wage faced by the MNE (w^*). This is also the normal case under centralised wage setting without market interaction. However under centralised wage setting and market interaction this is often reversed.

It follows from the above that when wages are set at the firm level, the MNE will strategically underinvest in capital in order to keep the wage down. This will be reversed in those centralised wage setting situations in which the wage is negatively related to the level of capital invested.

With respect to the optimal policy, the no-market interaction subsidy under wage centralisation contains a term that is not present when wages are set at the firm level. This extra term, due to the negative distortionary effects of a higher centralised wage, works towards a tax when the wage increases in capital. Things are less clear in the market interaction case as the centralised wage may fall in the level of K. In general however, these results confirm that the host country's government may not find it optimal to encourage a higher level of FDI via capital subsidisation.

Thus, in the paper we have looked at the two dimension of FDI: location and the amount of capital committed. We have found that in both cases the government will often wish to discourage FDI, in particular in the presence of negative externalities generated by the MNE towards domestic firms through either the goods or the unionised labour market.

6. Concluding Remarks

This paper focuses on the nature of product market interaction between a MNE and

a host country's firms in examining the effects of different degrees of wage setting centralisation on **(1)** the incentive of a MNE to locate in the host country, **(2)** the optimal level of investment it decides to commit to its foreign operation, and **(3)** the host country's welfare.

Our results suggest that there may be circumstances in which it will not be desirable for a government to encourage inward FDI. We find that negative welfare effects of FDI occur when there is direct product market competition between the MNE and the host country's firms. In this case the foreign MNE will effectively capture market shares from indigenous firms thus reducing their profits. This effect is shown to be particularly strong in the presence of centralised wage setting processes. Hence, we highlight a channel through which inward FDI can have adverse effects on the host country's welfare. Clearly, in real world situations the net change in welfare would depend on many other factors (e.g. technical spill-overs from foreign firms). However, we believe that our findings, which cast at least some doubts on the general validity of the commonly held view that FDI is always welfare improving, are intuitive and are consistent with some of the empirical evidence on FDI (see Caves, 1996, for a discussion of the effects of FDI on market structure and indigenous firms profitability). Therefore, our analysis points to the need for empirical research to disentangle the relative importance of this and of the other factors which determine the welfare effects of FDI on the receiving country.

When the capital investment of the MNE is endogenous, the wage setting regime affects the amount of capital invested and the potential for rent extraction. We show that the MNE will tend to underinvest relative to the cost-minimising level in order to limit the rent extraction of the union, if the negotiated wage is positively related to capital investment.

We also show that, contrary to what frequently argued, in the absence of taxes/subsidies, the MNE will be less likely to locate in the host country under a decentralised than under a centralised wage setting regime, despite the fact that the latter will typically yield higher wages.

Many natural extensions suggest themselves, such as technological spill-overs from MNEs to domestic firms, experimenting with different degrees of bargaining power of the unions, and examining cases in which the MNE can negotiate special union arrangements

with the host country's government. These topics are left for future research.

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