Foreign Direct Investment, Labour Unions, and Self-interested Governments

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Abstract

This document examines foreign direct investment (FDI) when multinationals and labour unions bargain over labour contracts and lobby the self-interested government for taxation and labour market regulation. It is shown that FDI is best protected from expropriation in unionized economies with right-to-manage bargaining, not bargaining over wages and employment. When the labour market is non-unionized or when there is bargaining over wages and employment, the ruling elite can use taxation or labour market regulation as a non-distorting vehicle to expropriate the surplus of FDI.

Journal of Economic Literature: F21, F23, J51, D78
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1 Introduction

This paper considers the profitability of foreign direct investment (FDI) in economies with labour unions and self-interested local elites. Because FDI involves sunk costs, the investment risk of a multinational company (MNC) is comprised of changes in wages, taxes, regulations and market conditions that implicitly expropriate the MNC's rents after FDI has taken place. To explain the strategic dependence between unions, authorities and prospective investors, we use a common agency model,[1] and establish a political equilibrium in which the government determines taxes and regulates the labour market. In this environment, lobbies representing unions and MNCs make offers that relate prospective contributions to government policy.

The government can regulate union power in two ways. First, it can restrict the number of workers which can take part in a strike. Second, it can (e.g. by compulsory arbitration) weaken the union's possibilities to respond to the employers' offers. In the traditional collective bargaining models, the relative bargaining power of the labour unions is taken as fixed. The microfoundations of this approach[2] are that when two players are making alternating offers to each other, they behave so as to maximize a weighed geometric average of their utilities – the Generalized Nash product. The weights of such an average, which reflect the relative bargaining power of the parties, are determined by the parameters of the model. Labour market regulation influences union power through these parameters. Following Blanchard and Giavazzi (2003), we assume that the government can make

[1] Cf. Bernheim and Whinston (1986), Grossman and Helpman (1994), and Dixit, Grossman and Helpman (1997).

[2] Cf. Osborne and Rubinstein (1990).

smooth and continuous changes in union power. The results can then be generalized for discrete changes in union power.

Brander and Spencer (1987) present unemployment as the main reason why an economy promotes job-creating FDI, but they do not construct any real theory of unemployment. In the studies that examine the strategic interaction between MNCs and local governments, no foreign investment typically occurs unless taxation is restricted so that MNCs can end up with a positive profit. Bond and Samuelson (1989) assume that an MNC has certain bargaining power which it can use against the government. In Doyle and Van Wijnbergen (1984), and Bond and Samuelson (1986), the government can commit itself to tax holidays in the initial periods, so that foreign investors have an opportunity to recoup their sunk costs before the government imposes new taxes. In Choi and Esfahani (1998), the government's ability to tax FDI is limited by an MNCs ability to withhold an important production asset, which causes the specific capital of the host economy to become idle. Our study differs from these papers in the following respects:

- In the papers referred to above, the government is entirely benevolent (i.e., it has no interests of its own), but we assume that the ruling elite is self-interested, and receives contributions from interest groups (e.g., MNCs and labour unions) in return for modifications in public policy.
- We demonstrate that the political process prevents the expropriation of profits, even without institutional restrictions on taxation.

The following papers examine the relationship between labour unions and MNCs with inward FDI. Naylor and Santoni (1999) suggest that because high wages reduce potential rents associated with investment, a decrease in relative union bargaining power in a potential host economy subsequently increases the likelihood of FDI within that economy. Zhao (1998) shows that because FDI increases MNCs' mobility between economies, it improves MNC's position in collective bargaining and depresses union wages in every economy. These papers assume that relative union bargaining power is exogenously given, and that there is bargaining over wages only. We assume that relative union bargaining power is endogenous in the political equilibrium. Following Manning (1987a; 1987b), we also assume a MNC and a labour union can bargain over both wages and employment.

Haaparanta (1996) examines inward FDI in a common agency framework. Because he focuses on a case in which a number of benevolent governments try to attract an MNC to make FDI, he assumes the governments to be principals, and the MNC he designates as the agent. In this paper, we consider the case where an MNC's willingness to invest in a country depends on both labour market institutions and the response of a self-interested government. Hence, we assume that the MNC and the union representing its workers are principals, while the government is the agent.

Palokangas (2003a) examines the political economy of collective bargaining in the following framework. The economy is closed and output is produced from labour only. First, there is a bargain over wages, then a bargain over employment between the producer and the labour union. Depending on government regulations, union power may be different within these two bargains. Workers and producers lobby the government. The main result is that if it is much easier to tax wages than profits, then the government protects union power by labour market regulation. In this document, we extend Palokangas' (2003a) model for an open economy with FDI.

This paper is organized as follows. Section 2 presents the basic structure of the model as an extensive game. Section 3 defines technology and collective bargaining. The government's behaviour is endogenized in section 4. The political equilibrium is constructed in sections 5 and 6.

2 Institutions as an extensive game

The economy is open. A MNC produces its output from labour, capital and accumulates capital through FDI. After FDI has occurred, capital goods cannot be sold.[3] Hence, capital cost is sunk for the MNC. The MNC and the labour union bargain first over wages and then over employment. The government sets taxes, provides public services and regulates the labour market. Any public policy measures that strengthen (weaken) the position of unions in collective bargaining are called labour market *regulation (deregulation)*. Unions and MNCs lobby the government, and offer contributions that are conditional on prospective public policy.

The MNC sees the economy only as an export base and is therefore not interested in the local market it offers. There exists a competitive sector which produces b units of traded goods from one labour unit. Because workers are free to move to that sector, their opportunity wage is equal to b. Given these assumptions, we can focus on an economy in which there is only one MNC and one worker. These two agents bargain over labour conditions and lobby the government. The government is free to set any income tax rate $t \in (-\infty, 1)$ for the worker, and is free to place any *ad valorem* tax rate

[3] Grout (1984) and Palokangas (2000), Chapter 5, assume that capital can be sold abroad as old investment goods after machines have been installed. Because this extension would excessively complicate the model, we prefer to assume that capital is wholly country-specific.

$\tau \in (-\infty, 1)$ on the MNC's investment. Because the MNC can use transfer pricing to avoid profit taxes, we assume, for simplicity, that there is no direct tax on the MNC's profit.[4]

We present the institutional characteristics of the economy as an extended game with the following sequence of events.[5] First, the worker and the MNC lobby the government (or the political elite) by announcing contributions. Second, the government sets taxes, regulates relative union power in the bargains over the wage and employment, and collects the contributions. Third, the MNC decides on its investment. Fourth, the worker and the MNC bargain over the wage. Fifth, the worker and the MNC bargain over employment. Sixth, the MNC determines its output. This extensive game is now solved through backward induction.

3 Production and collective bargaining

The MNC produces its output y from capital k and labour l through the thrice differentiable and strictly concave production function

$$y(l,k),\ \ y_l > 0,\ \ y_k > 0,\ \ y_{ll} < 0,\ \ y_{kk} < 0,\ \ y(0,k) = y(l,0) = 0,$$

where subscripts l and k denote the partial derivatives with respect to l and k. The MNC's unit capital cost c is given from abroad. Because the government determines which workers cannot take part in a strike, the number l_0 of non-

[4] It would be only a minor modification of the model to extend it, in line with Palokangas (2003a), to the case where the MNC pays profit taxes but conceals its profits from the government at some cost. The profit tax would then be set according to the Ramsey rule (see proposition 5). Otherwise, the results would be the same as in this paper.

[5] In a larger version of this paper [Palokangas (2003b)], the author examines also the case where labour contracts are credible, i.e. where wage and employment bargaining takes place before investment. The results are more or less the same as in this paper, except that the credibility of labour contracts increase the MNC's expected profit.

striking workers is the government's policy instrument. We define

$$l_0 = \begin{cases} \theta & \text{in the bargain over the wage,} \\ \xi & \text{in the bargain over employment.} \end{cases} \tag{1}$$

The MNC's total profit is then given by

$$\pi = \begin{cases} \Pi \doteq y(l,k) - wl - (1+\tau)ck & \text{without a strike,} \\ \underline{\Pi}(l_0,k,\tau) \doteq y(l_0,k) - bl_0 - (1+\tau)ck & \text{with a strike,} \\ -ck & \text{without production,} \end{cases} \tag{2}$$

where b is the reservation wage. The expropriating tax $\hat{\tau} = [y(l,k) - wl]/(ck)$ then equalizes the profits with and without production. The worker's income in the MNC's service, V, is given by

$$v = V \doteq (1-t)wl - bl = [(1-t)w - b]l, \tag{3}$$

where wl is total wages, t the labour tax and b the competitive wage.

We assume that the worker and the MNC can change their wage and employment policy after the MNC has made its investment k.[6] Since the worker (or union) can prevent production from taking place, then, noting (2), the MNC's status quo income is given by $\underline{\Pi}$. Since without production the worker earns nothing, his/her status quo income is zero.

The MNC chooses first its investment k, before the bargains take place over the wage w and employment l. The worker attempts to maximize his/her income V, while the MNC attempts to maximize its profit Π minus its status quo income $\underline{\Pi}$. There is asymmetric Nash bargaining over the wage w and employment l. First, the product $V^{\alpha}(\Pi - \underline{\Pi})^{1-\alpha}$ is maximized by the wage w, where parameter $\alpha \in [0,1]$ is the measure of union relative bargaining power. Finally, the product $V^{\beta}(\Pi - \underline{\Pi})^{1-\beta}$ is maximized by employment l, where parameter $\beta \in [0,1]$ is the measure of union relative bargaining power.

[6]The case where the worker and the MNC can change their wage and employment policy after the MNC has made its investment is examined in the larger version of the model [Palokangas (2003b)].

The sequential subgame is solved backwards as follows. At the final stage, given (1), (2) and (3), employment l is determined by

$$\begin{aligned}\max_l V^\beta[\Pi - \underline{\Pi}(\xi,k,\tau)]^{1-\beta} &= \max_l \big\{\beta \log V + (1-\beta)\log[\Pi - \underline{\Pi}(\xi,k,\tau)]\big\}\\ &= \max_l \big\{\beta \log l + (1-\beta)\log[y(l,k) - wl - y(\xi,k) + b\xi]\big\}.\end{aligned}$$

Given this, the wage w is equal to the weighted sum of the average product $[y(l,k) - y(\xi,k) + b\xi]/l$ and the marginal product $y_l(l,k)$ of labour, where the weights are the worker's and the employer's relative bargaining power:

$$w = \beta[y(l,k) - y(\xi,k) + b\xi]/l + (1-\beta)y_l(l,k). \tag{4}$$

Inserting this into (2) and (3) yields the worker's income and profit as follows:

$$\begin{aligned}&v = V(l,k,t,\tau,\beta,\xi) = (1-t)\big\{\beta[y(l,k) - y(\xi,k) + b\xi] + (1-\beta)ly_l(l,k)\big\} - bl,\\ &\pi = \Pi(l,k,\tau,\beta,\xi) \doteq y(l,k) - wl - (1+\tau)ck\\ &\quad = (1-\beta)[y(l,k) - ly_l(l,k)] - (1+\tau)ck + \beta[y(\xi,k) - b\xi],\\ &\frac{\partial V}{\partial l} = (1-t)[y_l + (1-\beta)ly_{ll}] - b, \quad \frac{\partial \Pi}{\partial l} = (\beta-1)ly_{ll} > 0, \quad \frac{\partial \Pi}{\partial \tau} = \frac{\partial \underline{\Pi}}{\partial \tau} = -ck.\end{aligned} \tag{5}$$

At the second stage of bargaining, the wage w is chosen to maximize the Nash product $V^\alpha(\Pi - \underline{\Pi})^{1-\alpha}$ by l, given the response at the second stage (4). Because there exists a one-to-one correspondence from w to l through (4), then, given (2), (3) and (5), one can equivalently maximize the logarithm

$$\begin{aligned}&\Lambda(l,k,\alpha,\beta,\theta,\xi,t) \doteq \log\big[V^\alpha[\Pi - \underline{\Pi}(\theta,k,\tau)]^{1-\alpha}\big]\\ &\quad = \alpha \log V(l,k,t,\tau,\beta,\xi) + (1-\alpha)\log[\Pi(l,k,\tau,\beta,\xi) - \underline{\Pi}(\theta,k,\tau)]\end{aligned} \tag{6}$$

by employment l. This yields the first-order and second-order conditions:

$$\frac{\partial \Lambda}{\partial l}(l,k,\alpha,\beta,\theta,\xi,t) = \frac{\alpha}{V}\frac{\partial V}{\partial l} + \frac{1-\alpha}{\Pi - \underline{\Pi}(\theta,k,\tau)}\frac{\partial \Pi}{\partial l} = 0, \quad \frac{\partial^2 \Lambda}{\partial l^2} < 0. \tag{7}$$

From (5), (6), (7) and $\alpha \in [0,1]$ it follows that

$$\frac{\partial V}{\partial l} < 0, \quad \frac{\partial^2 \Lambda}{\partial l \partial \alpha} < 0, \quad \frac{\partial^2 \Lambda}{\partial l \partial \theta} = \frac{1-\alpha}{(\Pi - \underline{\Pi})^2} \frac{\partial \Pi}{\partial l} \frac{\partial \underline{\Pi}}{\partial l_0}(\theta, k, \tau) > 0. \tag{8}$$

At the first stage of bargaining, the MNC maximizes its profit $\pi = \Pi(l, k, \tau, \beta, \xi)$ by investment k and employment l, given the equation (7). Given (3), (5) and (8), this maximization yields

$$\pi(\tau, t, \alpha, \beta, \theta, \xi) = \max_{l,k}\{\Pi \big| \ \partial\Lambda/\partial l = 0\}, \quad \pi\big|_{\beta=1,\,\xi=0} = -(1+\tau)ck < 0,$$
$$\partial\pi/\partial\tau = -ck < 0, \quad l(\tau, t, \alpha, \beta, \theta, \xi), \quad k(\tau, t, \alpha, \beta, \theta, \xi), \quad v(\tau, t, \alpha, \beta, \theta, \xi),$$
$$v\big|_{\alpha=\beta=0} = 0, \quad w\big|_{\alpha=\beta=0} = b/(1-t),$$
$$\pi\big|_{\alpha=\beta=0} = \max_{l,k}[y(l,k) - bl/(1-t) - (1+\tau)ck], \quad \big(\partial\pi/\partial t\big)_{\alpha=\beta=0} < 0. \tag{9}$$

4 Public policy

The government produces a quantity g of public services from traded goods, and finances this by tax revenue $twl + \tau ck$, where t is the tax on wage income wl and τ is the tax on investment expenditure ck. Given this, (4) and (9), we obtain the tax revenue function

$$g(\tau, t, \alpha, \beta, \theta, \xi) \doteq twl + \tau ck. \tag{10}$$

We assume that the economy is on the increasing part of the Laffer curve:

$$\partial g/\partial\tau > 0, \quad \partial g/\partial t > 0. \tag{11}$$

We denote the worker's and the MNC's contributions by R^w and R^f respectively. Subtracting R^f from the MNC's profit π yields the MNC's consumption C^f. Subtracting R^w from the worker's total income v yields the worker's consumption C^w. We specify differentiable functions

$$C^w(\tau, t, \alpha, \beta, \theta, \xi, R^w) \doteq v(\tau, t, \alpha, \beta, \theta, \xi) - R^w, \quad \partial C^w/\partial R^w = -1,$$
$$C^f(\tau, t, \alpha, \beta, \theta, \xi, R^f) \doteq \pi(\tau, t, \alpha, \beta, \theta, \xi) - R^f, \quad \partial C^f/\partial R^f = -1. \quad (12)$$

The worker's utility function is then given by

$$U^w(C^w) + U^g(g), \quad (U^w)' > 0, \quad (U^w)'' < 0, \quad (U^g)' > 0, \quad (U^g)'' < 0. \quad (13)$$

Following Grossman and Helpman (1994), and noting (10)-(13), we obtain the government's objective function as:

$$G(\tau, t, \alpha, \beta, \theta, \xi, R^w, R^f) = R^w + R^f + U^w(C^w) + U^g(g). \quad (14)$$

The government receives contributions from the worker and the MNC only if the MNC's and the worker's consumption, C^f and C^w, are non-negative. Otherwise, the MNC does not invest $k = y = 0$ or the worker refuses to work for the MNC, $l = y = 0$. Given this, the government chooses its policy parameters from the set

$$\Gamma \doteq \big\{(\tau, t, \alpha, \beta, \theta, \xi)\big| \; C^f\big(\tau, t, \alpha, \beta, \theta, \xi, R^c(\tau, t, \alpha, \beta, \theta, \xi)\big) \geq 0,$$
$$C^w\big(\tau, t, \alpha, \beta, \theta, \xi, R^w(\tau, t, \alpha, \beta, \theta, \xi)\big) \geq 0\big\}. \quad (15)$$

Now, we will explore the effects of lobbying by the MNC and the worker on taxation and labour market regulation (i.e., on variables τ, t, α, β, θ and ξ). The contribution schedule of the worker is given by $R^w(\tau, t, \alpha, \beta, \theta, \xi)$, and that of the MNC by $R^f(\tau, t, \alpha, \beta, \theta, \xi)$. The government maximizes its welfare (14) by choosing $(\tau, t, \alpha, \beta, \theta, \xi) \in \Gamma$. Following proposition 1 of Dixit, Grossman and Helpman (1997), a subgame perfect Nash equilibrium for this game is a set of contribution schedules $R^{w*}(\tau, t, \alpha, \beta, \theta, \xi)$ and

$R^{c*}(\tau,t,\alpha,\beta,\theta,\xi)$ and public policy $(\tau^*,t^*,\alpha^*,\beta^*,\theta^*,\xi^*)$ such that the following conditions $(i)-(iv)$ are satisfied:

(i) Contributions are non-negative but less than the contributor's income.

(ii) The policy $(\tau^*,t^*,\alpha^*,\beta^*,\theta^*,\xi^*)$ maximizes the government's welfare (14) taking the contribution schedules as given,

$$\begin{aligned}&(\tau^*,t^*,\alpha^*,\beta^*,\theta^*,\xi^*)\\ &\in \operatorname*{argmax}_{(\tau,t,\alpha,\beta,\theta,\xi)\in\Gamma}\big\{G\big(\tau,t,\alpha,\beta,\theta,\xi,R^w(\tau,t,\alpha,\beta,\theta,\xi),R^f(\tau,t,\alpha,\beta,\theta,\xi)\big)\big\}; \quad (16)\end{aligned}$$

(iii) The worker (MNC) cannot have a feasible strategy $R^w(\tau,t,\alpha,\beta,\theta,\xi)$ $\big(R^f(\tau,t,\alpha,\beta,\theta,\xi)\big)$ that yields him a higher level of utility than in equilibrium, given the government's anticipated decision rule,[7]

$$\begin{aligned}\big(\tau^*,t^*,\alpha^*,\beta^*,\theta^*,\xi^*,R^i(\tau^*,t^*,\alpha^*,\beta^*,\theta^*,\xi^*)\big) &\in \operatorname*{argmax}_{(\tau,t,\alpha,\beta,\theta,\xi)\in\Gamma} U^w(C^w),\\ \big(\tau^*,t^*,\alpha^*,\beta^*,\theta^*,\xi^*,R^i(\tau^*,t^*,\alpha^*,\beta^*,\theta^*,\xi^*)\big) &\in \operatorname*{argmax}_{(\tau,t,\alpha,\beta,\theta,\xi)\in\Gamma} C^f. \quad (17)\end{aligned}$$

(iv) The worker (MNC) provides the government at least with the level of utility that it could get when the worker (MNC) offers nothing $R^w=0$ $(R^f=0)$, and the government responds optimally given the MNC's (worker's) contribution function,

$$\begin{aligned}&G(\tau,t,\alpha,\beta,\theta,\xi,R^w(\tau,t,\alpha,\beta,\theta,\xi),R^f(\tau,t,\alpha,\beta,\theta,\xi))\\ &\qquad\geq \sup_{(\tilde\tau,\tilde t,\tilde\alpha,\tilde\beta,\tilde\theta,\tilde\xi)\in\Gamma} G(\tilde\tau,\tilde t,\tilde\alpha,\tilde\beta,\tilde\theta,\tilde\xi,R^w(\tilde\tau,\tilde t,\tilde\alpha,\tilde\beta,\tilde\theta,\tilde\xi),0)),\\ &G(\tau,t,\alpha,\beta,\theta,\xi,R^w(\tau,t,\alpha,\beta,\theta,\xi),R^f(\tau,t,\alpha,\beta,\theta,\xi))\\ &\qquad\geq \sup_{(\tilde\tau,\tilde t,\tilde\alpha,\tilde\beta,\tilde\theta,\tilde\xi)\in\Gamma} G(\tilde\tau,\tilde t,\tilde\alpha,\tilde\beta,\tilde\theta,\tilde\xi,0,R^f(\tilde\tau,\tilde t,\tilde\alpha,\tilde\beta,\tilde\theta,\tilde\xi)). \quad (18)\end{aligned}$$

[7]Here, the utility of the worker (MNC) is independent of his/her contribution schedule.

5 The political equilibrium

Given differentiable functions (12) and (13), conditions (17) take the form

$$\begin{aligned}
&\big(\tau^*, t^*, \alpha^*, \beta^*, \theta^*, \xi^*, R^w(\tau^*, t^*, \alpha^*, \beta^*, \theta^*, \xi^*)\big) \\
&\in \operatorname*{argmax}_{(\tau,t,\alpha,\beta,\theta,\xi)\in\Gamma} U^w\big(C^w(\tau, t, \alpha, \beta, \theta, \xi, R^w(\tau, t, \alpha, \beta, \theta, \xi))\big), \\
&\big(\tau^*, t^*, \alpha^*, \beta^*, \theta^*, \xi^*, R^f(\tau^*, t^*, \alpha^*, \beta^*, \theta^*, \xi^*)\big) \\
&\in \operatorname*{argmax}_{(\tau,t,\alpha,\beta,\theta,\xi)\in\Gamma} C^f(\tau, t, \alpha, \beta, \theta, \xi, R^f(\tau, t, \alpha, \beta, \theta, \xi))
\end{aligned} \tag{19}$$

and

$$\frac{\partial C^w}{\partial i} = \frac{\partial R^w}{\partial i} \text{ and } \frac{\partial C^f}{\partial i} = \frac{\partial R^f}{\partial i} \text{ for } i = \tau, t, \alpha, \beta, \theta, \xi, \tag{20}$$

which suggests that in equilibrium the change in the worker's (MNC's) contribution due to a change in the instrument is equal to the change in the worker's (MNC's) consumption due to this same fact. Thus, the contribution schedules are locally truthful. As in Bernheim and Whinston (1986), or in Grossman and Helpman (1994), this concept can be extended to a globally truthful contribution schedule. This type of schedule represents the preferences of the worker (capitalist) at all policy points. From (12), (18) and (20) it follows that the truthful contribution functions take the form

$$R^w = \max[0, v - v_0], \quad R^f = \max[0, \pi - \pi_0], \tag{21}$$

where v_0 (π_0) is the worker's (MNC's) income when he does not pay contributions but the government chooses its best response given the MNC's (worker's) contribution schedule.

Given $\partial\pi/\partial\tau < 0$ in (9), the government can press profit π down to zero by increasing τ. Hence, if the MNC does not pay contributions, $R^f = 0$, the government can choose $\pi = \pi_0 = 0$. This implies $R^f = \max[0, \pi - \pi_0] = \max[0, \pi] = \pi$ and $C^f = \pi - R^f = 0$. We summarize:

Proposition 1 *If the government is not able to commit to non-expropriating investment tax τ, then it takes all surplus of FDI, $C^f = 0$.*

For the remainder of the study, we assume that non-expropriating investment taxation is eschewed e.g. by an international agreement. The problem is then whether this is enough to support the profitability of FDI.

Assume next $\alpha = \beta = 0$. Because then $\partial\pi/\partial t < 0$ by (9), the government can press profit π down to zero by increasing t. This implies $R^f = \max[0, \pi - \pi_0] = \max[0, \pi] = \pi$, $C^f = 0$ and the following result:

Proposition 2 *If the labour market is competitive, $\alpha = \beta = 0$, then the government takes all surplus of FDI, $C^f = 0$.*

This result is in distinct contrast with the conventional wisdom that MNCs should prefer a fully deregulated (or non-unionized) labour market.

Now, assume that the government can freely choose relative union power $\beta \in [0, 1]$ and the number of non-striking workers, ξ, in the bargain over employment. If the MNC does not pay contributions, $R^f = 0$, then, given (9), the government sets β high enough and ξ low enough to press profit π down to zero, $\pi_0 = 0$. We summarize:

Proposition 3 *If there is a bargain over employment, then the government can use labour market regulation (i.e. β or ξ) as a non-distorting income transfer by which it takes all surplus of FDI, $C^f = 0$.*

Propositions 2 and 3 yield the following corollary:

Proposition 4 *Only with right-to-manage bargaining (i.e. with no bargain over employment, $\beta = 0$) does FDI yield profit, $C^f > 0$.*

6 Policy rules

Assume that relative union power in the bargain over employment, β, is kept constant. Conditions (16) then take the form that the government's objective function (14) must be maximized by τ, t and α subject to set (15). Given (13) and (19), this is equivalent to maximizing the function

$$\begin{aligned}\mathcal{L} =& R^w(\tau,t,\alpha,\beta,\theta,\xi) + R^f(\tau,t,\alpha,\beta,\theta,\xi) + U^w(C^w_*) + U^g\big(g(\tau,t,\alpha,\beta,\theta,\xi)\big)\\ &+ \mu C^w\big(\tau,t,\alpha,\beta,\theta,\xi,R^c(\tau,t,\alpha,\beta,\theta,\xi)\big)\\ &+ \vartheta C^f\big(\tau,t,\alpha,\beta,\theta,\xi,R^c(\tau,t,\alpha,\beta,\theta,\xi)\big),\end{aligned} \tag{22}$$

by τ, t and α, where, by the envelope theorem, C^w_* and C^f_* can be taken to be independent of τ, t and α, and the multipliers μ and ϑ satisfy conditions

$$\begin{aligned}&\mu C^w\big(\tau,t,\alpha,\beta,\theta,\xi,R^c(\tau,t,\alpha,\beta,\theta,\xi)\big) = 0, \quad \mu \geq 0,\\ &\vartheta C^f\big(\tau,t,\alpha,\beta,\theta,\xi,R^c(\tau,t,\alpha,\beta,\theta,\xi)\big) = 0, \quad \vartheta \geq 0.\end{aligned} \tag{23}$$

The worker's and MNC's total revenue $C \doteq C^w + C^f$ is equal to output y minus capital cost ck minus the worker's opportunity wages bl minus the government's tax revenue g. Given (9) and (10), we then obtain

$$C(\tau,t,\alpha,\beta,\theta,\xi) \doteq C^w + C^f = y(l,k) - bl - ck - g. \tag{24}$$

If $C^w > 0$ and $C^f > 0$, then $\beta = 0$ holds by proposition 4 and noting (20), (22), (23) and (24), we obtain the first-order conditions for the τ and t:

$$\begin{aligned}\frac{\partial\mathcal{L}}{\partial i} &= \frac{\partial R^w}{\partial i} + \frac{\partial R^f}{\partial i} + (U^g)'\frac{\partial g}{\partial i} = \frac{\partial C^w}{\partial i} + \frac{\partial C^f}{\partial i} + (U^g)'\frac{\partial g}{\partial i} = \frac{\partial C}{\partial i} + (U^g)'\frac{\partial g}{\partial i}\\ &= 0 \ \text{ for } i = \tau, t.\end{aligned} \tag{25}$$

These conditions yield the following rule:

Proposition 5 *A rational government sets taxes to minimize the deadweight loss of public finance. If both the MNC and the worker benefit from FDI,* $C^f > 0$ *and* $C^w > 0$*, then the government sets taxes so that the decrease in total consumption* C *due to a marginal increase in each tax is in the same proportion to the increase in tax revenue* g *due to it,* $\frac{\partial C}{\partial \tau} \Big/ \frac{\partial g}{\partial \tau} = \frac{\partial C}{\partial t} \Big/ \frac{\partial g}{\partial t}$.

There are two sources of the deadweight loss of public finance: a lower profit leads to lower investment and there is an opportunity wage b. These sources make the tax revenue elastic with respect to the labour and investment taxes.

Given (22) and (24), we obtain the first-order conditions for α and θ:

$$\begin{aligned} \frac{\partial \mathcal{L}}{\partial i} &= \frac{\partial R^w}{\partial i} + \frac{\partial R^f}{\partial i} + (U^g)' \frac{\partial g}{\partial i} + \mu \frac{\partial C^w}{\partial i} + \vartheta \frac{\partial C^f}{\partial i} \\ &= \frac{\partial C}{\partial i} + (U^g)' \frac{\partial g}{\partial i} + \mu \frac{\partial C^w}{\partial i} + \vartheta \frac{\partial C^f}{\partial i} = 0 \text{ for } i = \alpha, \theta. \end{aligned} \quad (26)$$

In the model, the partial derivatives of C with respect to α and θ are unfortunately ambiguous. We make however the plausible assumption that the increase in union power (i.e. a higher α or a smaller θ) reduce total consumption, $\partial C/\partial \alpha < 0$ and $\partial C/\partial \theta > 0$, but increase the worker's consumption, $\partial C^w/\partial \alpha > 0$ and $\partial C^w/\partial \theta < 0$. This and the definition (24) imply $\partial C^f/\partial \alpha < 0$ and $\partial C^f/\partial \theta > 0$. If $\partial g/\partial \alpha \leq 0$, then, given (23) and (26), the worker will not then benefit from FDI:

$$\mu = -\left[\frac{\partial C}{\partial i} + (U^g)' \frac{\partial g}{\partial i} + \vartheta \frac{\partial C^f}{\partial i}\right] \Big/ \frac{\partial C^w}{\partial i} > 0 \text{ for } i = \alpha, \theta,$$

which implies $C^w = 0$. In the remaining case $\partial g/\partial \alpha > 0$, there is either $\partial C/\partial \alpha + (U^g)' \partial g/\partial \alpha = 0$ or $C^f = 0$. We summarize these results as:

Proposition 6 *If deregulation (i.e., a decrease in* α*) does not reduce tax revenue* g*,* $\partial g/\partial\alpha \leq 0$*, the government eliminates through it the worker's benefit from FDI,* $C^w = 0$*. Only if tax revenue is an increasing function of union power,* $\partial g/\partial\alpha > 0$*, does there exist a political equilibrium in which the government maintains union power by regulation to minimize the deadweight loss of public finance. When both the MNC and the worker benefit from FDI,* $C^f > 0$ *and* $C^w > 0$*, the government increases union power* α *through regulation until the decrease in total consumption* C *due to it is in proportion* $\frac{\partial l}{\partial t}\Big/\frac{\partial l}{\partial t}$ *to the increase in tax revenue* g *due to it,* $\frac{\partial l}{\partial\alpha}\Big/\frac{\partial g}{\partial\alpha} = \frac{\partial l}{\partial t}\Big/\frac{\partial g}{\partial t}$*.*

This proposition can be explained as follows. Because labour market deregulation (the decrease in α) decreases union power and wages but increases the MNC's and worker's total revenue C, it is in the government's best interest to implement deregulation as long as this does not decrease tax revenue, $\partial g/\partial\alpha \leq 0$. If regulation (i.e., the increase in α) increases tax revenue g, then the government uses regulation in combination with taxes t and τ as a means of evening out the deadweight loss of public finance. Then, in equilibrium, the decrease in total revenue C must be in the same proportion to the decrease in tax revenue g for a marginal increase of any of the three policy instruments τ, t and α.

7 Conclusions

This paper examines the MNC's investment risk. The main characteristics of this model are the following. If the government protects union power, then the MNC bargains over wages and employment with a labour union. Self-interested governments set taxes to finance public services and regulate the labour market, and lobbies representing the workers and MNCs try to influence government policy. There are sunk costs associated with FDI.

Conventional wisdom has said thus far that labour market deregulation improves the competitiveness of the economy as regards attracting FDI. In contrast, this document suggests that deregulation presents a potential risk for FDI. When wages are competitively determined, the government can use labour and investment taxes as a combined non-distorting instrument, by which it can expropriate all surplus of FDI. When there is bargaining over both wages and employment, governments can use taxation and labour market regulation together as a non-distorting instrument for the same purpose. Hence, only right-to-manage bargaining truly ensures profits for FDI.

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