

**The Transformation of a Labour Managed Monopoly:
Competition Policy versus Mixed Firms**

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Abstract

Starting from a market monopolized by a two plant labour-managed (LM) firm, we consider alternative ways to reduce the inefficiencies associated with this market arrangement. The first possibility is the creation of a duopoly, in which a plant is turned into a LM firm, while the other one is either LM, or is managed to maximize profits. The second one is the negotiated creation of a "mixed firm",

managed by workers and Government representatives. Its objective function reflects the different goals of its participants. Welfare comparisons purport the mixed duopoly as the preferable solution.

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1. Introduction

Recent instances of industrial policy in Eastern countries have shown that the road to privatization will not closely parallel the one followed in some Western countries. To privatize firms in the East stock exchange markets are not sufficient; moreover they still have to be built from scratch. Viable and actual solutions seem to be "mixed privatizations" whereby stakes of a collective firm are sold partly to banks (which are state owned), partly to foreign investors, partly to residents, and finally to workers of the firm. Different agents with their own goals will sit in the corporate board and the firm's objective function has to be defined.

The schedule of opportunities and proposals for firm organization is quite ranging. Scrapping central planning and setting up markets does not imply that the organization of firms will closely replicate the Western paradigm (Jasinski, 1990). There are financial and social harnesses which let the transition to a market economy take on some puzzling features.

The Shatalin program and the economic policy of the Polish government (Nordhaus, 1990; Lipton - Sachs, 1990) are clear steps away from central dirigism. In both cases, however, the organization of the firm which should emerge is fairly fuzzy. There seem to be a wide range of possible outcomes ranging from state enterprises, cooperative enterprises, joint stock companies owned by employees, *mixed enterprises* where different objective functions coexist. We come across such a variety of results in Western Europe as well. Most of the times they are the outcome of the interaction of social and economic forces over past decades.

The purpose of this paper is to tackle the issue of a possible transformation of a market structure made up by a two plant cooperative monopoly. A social framer

faces three broad alternatives:

- 1) to split the labour managed (LM) monopoly into two independent LM firms;
- 2) to give rise to a mixed duopoly made up by a LM firm and a profit - seeking firm;
- 3) to build a mixed duopoly made up of a LM firm and social welfare maximizer firm;
- 4) to form a mixed monopoly whose objective function is the result of a compromise between the framer and the workers' representatives.

The social desirability of different market arrangements has partially been assessed (Delbono - Rossini, 1991) without considering that the corporate board of the mixed firm might be the result of a bargaining between the framer and the LM firm.

In this paper we consider this possibility, modelling the outcome of the bargaining as a cooperative Nash equilibrium (NBE). In this way it is also possible to obtain more definite analytical results on the relative desirability of the alternative market arrangements we consider. In particular, we can show that the mixed duopoly emerges as the socially preferable set-up, definitely pointing towards a competition policy solution.

The paper is organized as follows. In the next section we present the basic model, while section 3 introduces and analyzes the bargaining process between the framer and the workers, assuming that the framer's representatives in the mixed firm aim at maximizing profits. In section 4 we investigate the two duopoly settings already mentioned. Section 5 contains the main welfare comparisons and the results of the paper. Section 6 briefly shows to what extent the previous results are changed when the framer's representatives maximize social welfare. Section 7 concludes the paper.

2. The basic model

Let us first describe the status quo. Following the setting proposed by Delbono and Rossini (1991), we consider a market where a cooperative firm acts as monopolist, using two plants to produce a homogeneous good. This firm faces a linear demand curve

$$p = a - Q \quad (1)$$

where p is price, and Q is total output: $Q \equiv \sum_{i=1}^2 q_i$. Each plant (indexed by i) requires a fixed set-up cost, F , and produces the good q_i with the technology described by the following production function:

$$q_i = \sqrt{L_i} \quad (2)$$

where L_i is the number of workers employed in plant i .

Following an established literature (see Ireland - Law, 1982; Bonin - Putterman, 1987), we assume that the cooperative firm maximizes surplus per worker, which, using (2), can be written as:

$$V_c = \frac{pQ - 2F}{q_1^2 + q_2^2} \quad (3)$$

The FOC determines equilibrium output Q_c as:

$$Q_c = \frac{4F}{a} \quad (4)$$

This yields a positive surplus, over the market wage assumed equal to 1, if and only if $a^2 \geq 12F^1$.

First of all, we want to compare this status quo with other cases of

¹ Second order conditions are met, and returns to scale are locally increasing as shown by Crémer and Cremer (1990).

monopolistic firms, i.e., a profit maximizing one and a state-owned one. In both cases, given (2), the firm's cost function is :

$$C(Q) = 2F + q_1^2 + q_2^2 \quad (5)$$

Notice that, when the two plants produce the same output level,

$$q_1^2 + q_2^2 = \frac{1}{2}Q^2.$$

If the firm maximizes profits (π), i.e.:

$$\pi = pQ - 2F - \frac{1}{2}Q^2 \quad (6)$$

the FOC indicates that equilibrium output is

$$Q_p = \frac{a}{3} \quad (7)$$

Total profit is non-negative if and only if $a^2 \geq 12F$. We will assume throughout the paper that this *viability condition* holds.

On the other hand, were the monopolistic firm owned by a social "framer", its objective function would be total surplus, defined as:

$$W = \int_{\gamma=0}^Q (a - \gamma)d\gamma - 2F - q_1^2 - q_2^2 \quad (8)$$

Proceeding in the usual way, we can find equilibrium output as

$$Q_s = \frac{a}{2} \quad (9)$$

Total surplus is positive if and only if $a^2 \geq 8F$.

The first very standard conclusions that can be drawn on this basis are that, when private profit is non-negative, the output level produced by a private monopoly would be larger than the one produced by a cooperative monopoly.

Both would obviously be too low from a social viewpoint, but the cooperative firm yields the larger distortion.²

Straightforward calculations show that the welfare level achieved with a LM monopolist is:

$$W_c = 2F \left(1 - \frac{8F}{a^2} \right) \quad (10)$$

Equation (10) provides the status quo welfare level. With a private monopolist total welfare would be:

$$W_p = \frac{2}{9}a^2 - 2F \quad (11)$$

while a public firm, maximizing (8), would achieve

$$W_s = \frac{a^2}{4} - 2F \quad (12)$$

Thus, it is trivial to ascertain that, given the viability condition,

$$W_c < W_p < W_s$$

which confirms the previous intuition.

² This holds unless we take into account the utility of being in a LM firm (Bonin - Putterman, 1987).

3. Negotiated creation of a mixed firm

In the status quo we consider, we have a cooperative firm acting as a monopolist. Given the previous results, it is plausible to assume that a social framer, interested in total surplus, may try to intervene, using his authority to force the LM monopoly to change its behaviour.

As in Delbono and Rossini (1991), we consider two alternatives. The *first* one is the creation of a *mixed firm*, run jointly by representatives of the workers and by agents of the framer which aim at maximizing total profit³. This parallels the complex mixed arrangements that may emerge in the privatization process we referred to in the introduction: the huge number of firms to privatize will require the intervention of many actors, who will most of the times have different objectives to pursue. In this sense we speak of *mixed firm*. The *second* one is some form of competition policy. We examine the first alternative in this section, while the next one will be devoted to an analysis of different forms of competition policy. We will then compare the equilibria obtained in the different situations, trying to establish which setting is preferable from the social viewpoint.

The objective function of this *mixed firm* is thus a compromise between conflicting objectives. The mixed firm maximizes the following function:

$$V_{mp} = \alpha\pi + (1 - \alpha)V_c \quad (13)$$

³ Although it may seem unusual that a social framer would choose to favour profit maximization instead of surplus maximization, we will show in section 6 that, in the setting we use, this has only a limited relevance to the result.

where α can be interpreted as the weight of the social framer's agents in the firm's executive committee. The FOC for V_{mp} yields

$$\alpha Q_{mp}^3 (a - 3Q_{mp}) + 2(1 - \alpha)(4F - aQ_{mp}) = 0 \quad (14)$$

This condition defines implicitly equilibrium output Q_{mp}^* as a function of α , and highlights the crucial relevance of this parameter in the firm's decisions.

We assume here that, although the social framer has the power to *impose* a change in the objective function of the cooperative, the structure of the new corporate board has to be agreed upon by the workers. This seems plausible when the public authority perceives the need for a change and has to overcome firmly rooted interests that cannot simply be ignored. This sets a limit to the power of the social framer, and thus we assume that the value of α is determined by a bargaining between the framer and the workers. We model this process as a cooperative game, so that the value of α is determined as the Nash bargaining equilibrium of a game between the workers and the framer.

For the sake of simplicity, we assume for the moment that the outside options of the two players (i.e., the payoffs they get if the bargaining does not reach an equilibrium) are both equal to zero. This may be considered a fairly extreme assumption, and it requires some comments. As regards the framer, this can be interpreted saying that the existing firm is the only one that has the necessary competence to operate in this industry, so that the framer's outside option is zero. On the other side, the workers' outside option is zero when they can be employed only in this sector, which may be plausible if they have very idiosyncratic skills, or if there is unemployment in the economy.

Therefore, in an interior solution α is determined as:

$$\alpha = \operatorname{argmax} \quad W(\alpha) \times V_c(\alpha) \quad (15)$$

The weights in the executive committee will be decided taking into account the effect of α on the mixed firm's decisions, and in particular on its output level, Q_{mp} , which will depend on α . In other words, we have something very similar to a two stage game, where in the first stage the players determine α through (15), and in the second stage the firm maximizes (13). Thus, W and V_c depend on α via Q_{mp} , and so we can write the FOC of (15) as:

$$\frac{\partial W}{\partial Q} \frac{dQ}{d\alpha} V_c(\alpha) = - \frac{\partial V_c}{\partial Q} \frac{dQ}{d\alpha} W(\alpha) \quad (16)$$

which can be simplified as

$$\frac{\partial W}{\partial Q} V_c(\alpha) = - \frac{\partial V_c}{\partial Q} W(\alpha) \quad (16')$$

Equation (16') can be interpreted as follows. In equilibrium $\partial W/\partial Q$ must have the opposite sign of $\partial V_c/\partial Q$. This is possible when $\partial W/\partial Q$ is positive, while $\partial V_c/\partial Q$ is negative, so that $Q_c < Q_{mp} < Q_s$. Thus, in line with intuition, the equilibrium value of α will be such that equilibrium output will lie in between the values that would maximize the objective functions of the negotiators⁴.

Using equations (3) and (8), condition (16') becomes:

$$(a - 2Q) \frac{(a - Q)Q - 2F}{\frac{1}{2}Q^2} = - \frac{2(4F - aQ)}{Q^3} [(a - Q)Q - 2F] \quad (17)$$

Trivial calculations and simplifications show that, when the equilibrium is determined by the FOC, α will be set so that

$$Q_{mp}(\alpha^*) = \sqrt{2F} \quad (18)$$

⁴ It is easy to show that the second order condition is met, as long as W and V_c are concave in output.

This result can be interpreted by saying that, as long as the equilibrium level α^* is determined by the FOC (16), first stage bargaining entirely determines equilibrium output⁵. Indeed, this is not too surprising, as we have seen that α enters the objective functions of the players only via the output level: the framer and the workers are interested in their relative weights in the executive committee only because they determine Q_{mp} .

It is interesting to note that equilibrium output increases with the fixed cost. This can be explained considering the bargaining equilibrium as a compromise between the optimal output levels of the two players. When F increases, the welfare maximizing output in the short run remains constant, while the output that would be chosen by a LM firm increases; these two effects yield (18).

While (18) does not provide an explicit value for α , this can be obtained substituting (18) in equation (14), the other (first order) condition that must hold in equilibrium. The equilibrium value of α is:

$$\alpha^* = \frac{a\sqrt{2F} - 4F}{a\sqrt{2F} - 4F - 6F^2 + aF\sqrt{2F}} \quad (19)$$

From (10) we can see that, for α^* to be between 0 and 1, we need the additional restriction $a^2 > 18F$. To interpret this condition, one should note that this guarantees $Q_{mp}(\alpha^*)$ to be smaller than Q_p . In other terms, when this condition is not met, we cannot have an interior solution to our bargaining problem, and so $\alpha = 1$: if $a^2 \leq 18F$, the bargaining leads to a complete transformation of the original LM firm: $Q_{mp} = Q_p$.

The intuition behind this finding is the following. When F is sufficiently

⁵ However, we will show that the existence of an interior solution is not a trivial issue.

large, the output level of the LM monopolist is close to the one that would be produced by a profit maximizing firm⁶. In this case, as the equilibrium of the bargaining between the workers and the planner is a sort of compromise between their conflicting interests, the negotiation would implicitly tend to set an output level even larger than Q_p . However, this cannot be the case, as with $0 \leq \alpha \leq 1$ the management of the firm will never choose an output exceeding the profit maximizing level.

Therefore, $Q_{mp} = \sqrt{2F}$ when $a^2 \geq 18F$ and $Q_{mp} = a/3$ when $a^2 \leq 18F$.⁷

Although $dQ/d\alpha$ "disappears" from the FOC [see equation (16')], the sign of this implicit derivative is important to the interpretation of our results. It is easy to show that equilibrium output increases with the weight of profits in the firm's objective function. If we define $G(Q, \alpha)$ as the left-hand side of equation (14), we have

$$\frac{dQ}{d\alpha} = -\frac{\partial G/\partial\alpha}{\partial G/\partial Q} \quad (20)$$

The denominator of the RHS of this equation must be negative, for the second order condition to hold. Thus, $dQ_{mp}/d\alpha$ has the same sign as $\partial G/\partial\alpha$. This can be written as:

$$\frac{\partial G}{\partial\alpha} = \frac{Q_{mp}^3 (a - 3Q_{mp}) - 2(4F - aQ_{mp})}{Q_{mp}^3} \quad (21)$$

This expression is certainly positive in equilibrium as $Q_{mp} \leq a/3 = Q_p$ and $Q_{mp} \geq 4F/a = Q_c$.

⁶ See Ireland -Law (1982).

⁷ When $a^2 = 18F$ then $a/3 = \sqrt{2F}$

This result is perfectly in line with intuition. Indeed, the social framer would like to turn the LM monopoly into a profit-maximizing firm to increase output, while for the workers an increase in α represents a reduction in their power within the firm and causes a loss in terms of surplus per head.

4. Alternative forms of competition policy

The distortion, relative to the social optimum, due to the LM monopolist may also be reduced by introducing some form of competition in the market. In the previous section we have relied on negotiation over the objective function as the device to improve economic efficiency, here we want to explore a market solution.

Two ways seem to be of particular interest. The first one, and maybe the simplest one from a "political" viewpoint, would be to break the monopoly into two firms, leaving the workers the power to manage them as separate economic entities; this would lead to a duopoly with LM firms.

In line with the previous framework, we assume that each firm maximizes the following objective function:

$$V_{ci} = \frac{(a - Q)q_i - F}{q_i^2} \quad (22)$$

The reaction function of firm i is :

$$q_i = \frac{2F}{a - q_j} \quad \text{for } i \neq j$$

The only Nash equilibrium of this duopoly game in which both firms are active is:

$$q_1 = q_2 = \frac{a - \sqrt{a^2 - 8F}}{2}$$

so that total output is

$$Q_{cc} = a - \sqrt{a^2 - 8F} \quad (23)$$

The second alternative we want to consider in this section, like Delbono and Rossini (1991), is a situation where the initial LM monopoly is split into two firms, only one of which remains a cooperative; the second firm will maximize profits. In this case, we have a mixed duopoly, in which heterogeneous firms act non-cooperatively; thus, here the two forces of profit maximization and competition are used jointly.

In this case, it is easy to show⁸ that the Nash equilibrium is *asymmetric*: the private firm and the cooperative produce, respectively:

$$q_p = \frac{5a - \sqrt{9a^2 + 32F}}{8}$$

$$q_c = \frac{-3a + \sqrt{9a^2 + 32F}}{2}$$

while total output in the duopoly equilibrium will be

$$Q_{cp} = \frac{-7a + 3\sqrt{9a^2 + 32F}}{8} \quad (24)$$

It is important to notice that this equilibrium exists if and only if we introduce an additional restriction, that guarantees that equilibrium payoff of the profit-maximizing firm is non-negative: we must have $a^2 \geq 12.5F$, and this

⁸ See Delbono and Rossini (1991) for further details.

requires a further restriction of the region of the parameters which we can accept to make our comparisons. Under this constraint the members of the LM firm will receive a surplus at least as large as market wage.

5. Welfare comparisons

We are now in a position that allows us to compare the social desirability of the different arrangements we have considered. The main questions we want to answer are thus the following:

- 1) Does the negotiated creation of mixed firms (joint stock companies) improve social welfare relative to the status quo?
- 2) Analogously: is competition policy desirable? And which of the forms we have considered is preferable?
- 3) Is the negotiated creation of mixed firms preferable to some form of competition policy?

To this end we have first to calculate explicitly the welfare levels that we obtain in the different cases, where total welfare is defined by (8). Let us first consider the different forms of competition policy. The case of LM duopoly [see equation (23)] yields the following welfare level:

$$W_{cc} = a\sqrt{a^2 - 8F} - a^2 + 6F \quad (25)$$

The mixed duopoly with a profit maximizing firm and a cooperative one yields a welfare level equal to:

$$W_{cp} = \frac{151a\sqrt{9a^2 + 32F} - 443a^2 - 816F}{64} \quad (26)$$

The first result we can establish is the following.

Proposition 1. The creation of a duopoly yields a larger welfare level than a LM monopoly: $W_{cc} > W_c$ and $W_{cp} > W_c$.

The proof requires a straightforward comparison of expressions (25) and (26) with (10), that shows the status quo welfare level. This indicates that some form of competition policy is always desirable, even if no firm maximizes profits.

The comparison between the two forms of competition policy is slightly more complex but provides an equally clear cut result:

Proposition 2. A mixed duopoly in which one firm maximizes profits while the other one is LM is preferable to a pure LM duopoly.

Proof. Straightforward algebra shows that $W_{cp} > W_{cc}$ if and only if

$$949.616a^8 - 12,995.329a^6F - 48,221.4a^4F^2 + 612,679.68a^2F^3 + 2,073.6F^4 > 0$$

Setting $a^2 \equiv kF$ we get an analogous condition with an inequality in k^4 which can be handled numerically, showing that it is always met for $a^2 \geq 12.5F$, the additional viability condition, for the mixed duopoly, obtained at the end of the previous section.

Q.E.D.

If we now want to compare the different forms of competition policy with the negotiated creation of a mixed firm, we have to distinguish between two cases.

Using expression (18) we can determine the welfare level associated with the mixed firm, when the market is large, and thus when $\alpha^* \in (0, 1)$:

$$W_{mp} = a\sqrt{2F} - 4F \tag{27}$$

On the other hand, when the market is small relatively to the fixed cost ($a^2 \leq 18F$) we know that the mixed firm will behave like a profit maximizing firm, and thus the welfare level it yields is the one defined by expression (11): $W_p = (2/9)a^2 - 2F$.

The first comparison, with the LM duopoly case, gives the following result.

Proposition 3. When $\alpha^* \in (0, 1)$, $W_{mp}(\alpha^*) > W_{cc}$. When $\alpha^* = 1$, $W_{mp} \geq W_{cc} \Leftrightarrow a^2 \geq 14.4F$.

Proof. Let us first examine the case of $\alpha^* < 1$. Using (25) and (27) and some algebra it can be shown that $W_{mp} > W_{cc}$ if and only if:

$$2a^6 - 65a^4F + 700a^2F^2 - 2500F^3 > 0$$

This expression is positive for $a^2 = 18F$. It is also easy to ascertain that it is increasing in a for $a^2 \geq 11.6F$, and this proves the first part of the Proposition.

The proof of the second part uses (25) and (11) and requires just some algebra and trivial simplifications.

Q.E.D.

This result indicates that the *partial* transformation of the labour managed monopoly, achieved bargaining with the workers, is always preferable to a LM duopoly when the market is sufficiently large. This confirms the intuition that introducing the profit motive may be extremely important in improving the efficiency of the economy we have considered.

However, when the profit motive dominates it may be preferable to eliminate the monopoly. In this case, we have to compare two typical and well understood

distortions: the one due to a private monopoly and the one due to cooperatives. Our result suggests, in line with intuition, that the former is more relevant when fixed costs are large relative to the market size, because, in this case, LM firms will tend to produce a larger output, as shown by equations (7) and (23)⁹.

As regards the last comparison, the result is even more clear-cut:

Proposition 4. A mixed duopoly, when viable, always yields a larger welfare than a mixed firm in which α is determined with the bargaining described in section 3.

Proof. In the case where $\alpha^* < 1$, some algebra shows that $W_{cp} > W_{mp}$ if and only if:

$$2,450a^8 - 73,049a^6F + 881,140a^4F^2 - 4,625,600a^2F^3 + 3,001,250F^4 > 0$$

Setting $a^2 \equiv kF$, we obtain an analogous condition in k^4 ; this expression is positive for $k = 18$ and increases for $k > 18$.

As regards the case where $\alpha^* = 1$, it is possible to check that $W_{cp} > W_{mp} = W_p$ if and only if

$$1,216a^4 - 31,797a^2F + 149,769F^2 < 0$$

this condition is met when a^2 is within an interval whose extremes are (approximately) $6.16F$ and $19.98F$. As this expression is relevant only for $a^2 < 18F$, the result follows.

Q.E.D.

⁹ Indeed, as the equilibrium of the LM duopoly is symmetric, to determine the relative desirability of the two situations one could simply compare the output levels of equations (7) and (23); the result would obviously be the same.

This result indicates that, whenever feasible, an appropriate mix of competition policy and the introduction of the profit motive is preferable to leaving a position of monopoly. Even if the monopoly has a more "profit oriented" management, competition policy seems to remain essential.

However, we have to remember that these results are based on the assumption that the outside options of the two players in the bargaining were equal to zero. This may not be considered completely general, but has allowed us to reach analytical conclusions of immediate interpretation. Relaxing this assumption would lead to FOCs that are not amenable to analytical handling.

6. Public versus private goals in the mixed firm

So far we have assumed that the social framer's agents in the mixed firm aim at transforming the LM firm into a profit maximizer. The social framer would do even better if his agents tried to maximize W instead of profits.

It is thus interesting to compare the previous situation with one in which the mixed firm's objective function is a combination of W and V_c :

$$V_{ms} = \beta W + (1 - \beta)V_c \quad (28)$$

The outcome of the bargaining is not affected by the change in the firm's objective function in the same way as before:

$$Q_{ms}(\beta^*) = \sqrt{2F} \quad (18')$$

The important change we observe in this case, is that the existence of an interior solution for β^* is not a problem in this case: the FOC for (28) is

$$\beta Q_{ms}^3 (a - 2Q_{ms}) + 2(1 - \beta)(4F - aQ_{ms}) = 0 \quad (29)$$

Combining (18') and (29), we obtain

$$\beta^* = \frac{1}{1+F} \quad (30)$$

The first consequence is that the existence of an interior solution for β requires no additional restriction; as the objective functions of the negotiators are the same as those represented in the firm's executive committee, equilibrium output will always be within an *open* interval between Q_c and Q_s .

Another interesting comparison is between α^* and β^* . It is easy to show that $\alpha^* > \beta^*$. As in the present case the social framer's agents in the executive committee are "more aggressive" (their maximum payoff is achieved for a larger output than before), the framer needs a smaller proportion of the executive committee to achieve a given objective (equilibrium output, $\sqrt{2F}$).

An extension of the previous results is quite straightforward. In particular, proceeding as before we can show that:

Proposition 5. A duopoly with a profit seeking firm and a LM one is always preferable to a *mixed firm* whose corporate board is , with β^* determined through a bargaining between the workers and the social framer.

A substantially opposite result follows if we consider a duopoly with two LM firms:

Proposition 6. $W_{ms} \geq W_{cc}$ if and only if $a^2 \geq 12.5F$.

Thus the *mixed firm* with partially public goals turns out to be preferable to the pure LM duopoly.

7. Conclusions

Starting from a market monopolized by a two plant LM firm, we have considered some possible transformations, which could be taken into account by a social framer whose purpose is to overcome the distortions associated with this sort of market structure.

The results obtained point towards a competition policy as a preferable solution: a mixed firm is socially inferior to a mixed duopoly in both cases of LM-public like mix and LM-profit maximizer mix. Only a duopoly made up by two LM firms is socially inferior to the mixed firm. This emphasizes the relevance of the allocative loss due to the LM enterprise.

Finally it appears simpler for the framer to declare its welfare maximizing objective instead of using the intermediate objective of profit. It will need less agents in the corporate board of the mixed firm.

We should outline some limitations of our analysis which simultaneously disclose some avenues for further research. First of all, our policy indications have been based on a partial equilibrium analysis. Of course, it would be desirable to address these issues within a general equilibrium framework, which would allow one to give a more satisfactory account of the effects of this institutional change.

Secondly, we have bypassed the problem of the distribution of surplus within the mixed firm. This may be considered relevant when one examines the incentive for the workers to accept the outcome of the bargaining. Finally, so far we have considered a closed economy, while it should be preferable to embed the analysis in an open economy context.

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