

# WORKING PAPERS IN ECONOMICS

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No. 02/08

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UNIONISED OLIGOPOLIES: IS THERE  
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# Mergers and capital flight in unionised oligopolies: Is there scope for a ‘national champion’ policy?

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March 2008

## Abstract

Many policy makers seem to prefer domestic alternatives to cross-border mergers. Can such sentiments make sense? We construct a model where cross-border mergers drive down union-set wages, where domestic mergers have larger non-labour cost synergies than international ones, and where policy evaluators care more about workers than capital owners. Apparently, the stage is set for national champion policies to be sensible. However, we also introduce the possibility of capital flight in the sense that a domestic firm can physically move its production out of the country. Restrictive cross-border merger policies can then seriously backfire, since they do not necessarily bring about a domestic merger – but capital flight instead.

*Keywords:* Cross-border merger, national champions, greenfield FDI, trade unions

*JEL classification:* F16, F21, J51, L13

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# 1 Introduction

As firms grow larger and larger, mergers tend increasingly to be international.<sup>1</sup> At the same time, many observers pose the question if a foreign takeover will lead to changes in decision making in the firm in a way that may hurt domestic stakeholders. If an industry needs restructuring and larger units, would it not be better with national merger alternatives that can help create ‘national champions’ that in turn can play a role on the world arena? Controversial recent proposed cross-border mergers include the attempt by Italian Enel to take over the French electricity and gas firm Suez (where French authorities favoured a merger between Suez and Gas de France), the proposed takeover of Spanish Endesa by German E.on (where what the European commission called ‘economic patriotism’ from Spanish authorities in the end lead E.on to withdraw its bid), and the case of Dubai Ports, that sought to take over six major ports on the east coast of the US. Moreover, in the summer of 2007, Norwegian authorities bought a large share of the oil service firm Aker Kvaerner, in order to prevent the majority owner from selling his shares to unspecified foreigners.<sup>2</sup> It is sometimes hard to pinpoint exactly what the opponents of ownership globalisation fear. Some seem to fear that international firms will be slightly too profit oriented – so that good jobs and headquarter services will disappear from the national economy – even when the domestic cost disadvantage possibly is quite small.<sup>3</sup> Others seem to worry about foreign owners perhaps being too little profit oriented. Vast amounts of money accumulate in oil-rich countries and in new industrial giants as China, and the trend is that this money increasingly is placed in sovereign wealth funds. Especially in the US many seem to worry that the commando heights of the economy might be taken over by foreign parties that possibly have strategic interests that do not necessarily

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<sup>1</sup>See UNCTAD (2005) for documentation on the multinational nature of production and investment.

<sup>2</sup>When Aker Kvaerner was formed through a big merger some years earlier, this alternative appeared to be much preferred in Norway to the other alternative, namely a takeover of Kvaerner by Russian Yukos.

<sup>3</sup>Mugele and Schnitzer (2008) explore a theoretical model of the relationship between ownership structure and location decision. Cultural proximity may lead an owner to locate activities at a location where he or she understands the culture better, so who is the low-cost provider of a service may be dependent on the nationality of the owner.

coincide with those of the host country.<sup>4</sup>

This paper is an attempt to understand such merger patriotism sentiments, and to discuss if national champion policies in some circumstances can be warranted. More specifically we want to develop a story where cross-border mergers have the potential to harm the interests of domestic workers. The model assumptions are not necessarily chosen for their empirical relevance, but rather to give the national champion argument a fair chance. We consequently open up the possibility that cross-border mergers are driven by the wish to keep down wages for workers in the domestic country. At the same time, we assume that merger synergies are largest in connection with a domestic merger (not with the cross-border alternative). Finally, we assume that policy makers put a higher weight on reductions in domestic wage levels than on possible increases in profits accruing to domestic citizens. All this would seem to suggest that a national champion policy could be the welfare optimal outcome. And this turns out to be correct if a domestic firm only has the choice between merging domestically or internationally. However, we then open up a third possibility. We fix attention on one particular domestic firm. This firm has three choices when it comes to industrial structure: It can merge domestically or internationally, or it can build up greenfield production capacity abroad.<sup>5</sup> Here greenfield FDI is modelled as an all-or-nothing choice, meaning that either the firm in question wholly produces domestically – or all its production is moved out of the country. An international merger can be bad from the viewpoint of unionised workers, as their wages are kept down, but full capital flight is even worse, since all jobs in the firm is then lost. We assume that policy makers can ban mergers, but not force firms to merge. A national champion policy that bans cross-border mergers could then just as well lead to the domestic firm investing greenfield abroad and thus fleeing the domestic economy – and not to a domestic merger. From the domestic society's viewpoint this kind of greenfield FDI turns out to be the worst of the options available. In sum, the paper cautions that a national champion policy can

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<sup>4</sup>Economist and previous US finance minister Lawrence Summers aired such scepticism against sovereign wealth funds at the 2008 World Economic Forum meeting in Davos. The Norwegian finance minister, Kristin Halvorsen, replied, in quite undiplomatic language, that the US "is in deep shit" and relies on the capital inflow (NTB, 21.01.2008).

<sup>5</sup>It is quite rare in the literature that all these three options are considered within a unified framework.

seriously backfire – even in a model setting that on the surface is constructed to make merger patriotism sensible. This does in no way imply that unionised workers cannot be hurt by globalisation or that cross-border mergers cannot be detrimental for domestic welfare, it only means that a restrictive policy towards cross-border mergers is simply not the right policy prescription.

There exists a quite large theoretical economics literature on international mergers, and a substantially smaller body of work on the national champion issue.<sup>6,7</sup> The current paper utilises elements that can also be found in Lommerud, Straume and Sjørgard (2006). Also in that paper cross-border mergers lead to a situation where a multinational firm can play unionised workers in different countries out against each other. This in turn may imply that cross-border mergers take place that are not welfare-improving. Rather, the point of the merger is to tilt the distribution of resources between groups in society, not to maximise surplus in society in some sense. However, that model is set up in such a way that first best merger policy often turns out to be to ban all mergers, rather than to pursue a national champion policy. In the current model, we have tilted the analysis even further in favour of national champions, for example by assuming that only domestic mergers entail variable cost synergies. The essential difference between the two papers, though, is that we here allow the possibility of internationalisation of the firm through foreign direct investment. Norbäck and Persson (2007) is an interesting paper that concerns itself with investment liberalization and cross-border mergers, but not the national champion question itself. The authors warn that a restrictive policy towards foreign takeovers can have unwanted effects, but their line of argument is distinctly different from ours. They consider inward greenfield FDI as the alternative to a cross-border merger, but here a domestic national champion merger is ignored as an alternative.<sup>8</sup> Norbäck and Persson emphasise that a developing country can harm itself by pursuing a restrictive cross-border merger policy. Combining

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<sup>6</sup>Open economy merger policy issues in a wider context are studied, for example, by Barros and Cabral (1994), Head and Ries (1997), Horn and Persson (2001a), Bjorvatn (2004), and Neary (2007).

<sup>7</sup>It is also relevant to mention the large literature on how different groups of workers, perhaps organised in trade unions, fare in the face of globalisation. See for example Naylor (1998), Neary (2002), Lommerud, Meland and Sjørgard (2003), Straume (2003), Saint-Paul (2007), Wälde and Weiss (2007) and Egger and Kreickemeier (2008).

<sup>8</sup>This also applies for Nocke and Yeaple (2007).

the strong firm-specific assets of a multinational with the strong country-specific assets of a domestic firm has the potential to create a large surplus. The important point is to create competition for the acquisition of the domestic asset, so that the successful multinational bidder does not pay a too low price. The multinational is not only willing to pay according to what the assets at play are worth for itself, it also has a value to prevent its competitors from obtaining the domestic firm. There are also several recent papers that discuss the national champion question more directly, but here greenfield FDI is typically not an option. We have learnt from the strategic trade literature that, in an international Cournot oligopoly, policy that increases the market share of domestic producers will be beneficial for the domestic country – if a policy evaluator only cares about the welfare of domestic agents. In such a framework it is interesting to investigate if a national champion type of merger policy can increase the welfare of domestic agents and the consequences for agents residing abroad. It is also interesting to investigate how merger policy interacts with tax policy in such a setting. Research that broadly pursues this type of questions include Hauffer and Nielsen (2008), Hauffer and Schulte (2007), Südekum (2006, 2007) and Lommerud, Olsen and Straume (2008).<sup>9</sup> Note that this type of analysis is quite different from the present model: we focus on how national champion policy can tilt the power balance between *domestic* stakeholders, which this literature pays little attention to.

There is also a substantial empirical literature on the foreign ownership wage premium. On the surface, in many countries workers tend to earn more in foreign-owned firms, seemingly at odds with the theoretical model developed here. Almeida (2007) uses a matched employer-employee data set from Portugal, and finds that the seemingly high wages in foreign owned firms has more to do with ‘cherry picking’ in the selection of takeover targets than human capital development and wage increases in firms having been bought. Heyman, Sjöholm and Tingvall (2007) also use such matched data, this time from Sweden. They find comparatively small wage premia associated with various forms of foreign ownership, and in the case of takeovers of Swedish firms the effect on wages is zero or neg-

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<sup>9</sup>Huck and Konrad (2004) also deal with merger policy in a strategic trade context.

ative. Girma and Görg (2007) report, from a British data set, substantial heterogeneity in the post-acquisition wage effect depending on the nationality of the acquirer and the skill group of workers. Almost no policy maker would take the stance that all international mergers are harmful. Sometimes a foreign takeover means that the local subsidiary can be developed in a better way and that the human capital of the employees is strengthened. Our model focuses on a case where workers secure high wages because their firms have market power, and where international mergers may threaten their position. All conclusions are of course then relative to this framework, and we wish to make no bold statement about the aggregate foreign-ownership wage effect in society.

The paper proceeds as follows. Section 2 presents the model framework. Then Section 3 analyses how firms arrive at a choice between merging domestically or internationally, whereas Section 4 evaluates the situation from a policy maker's viewpoint. Section 5 then introduces the possibility of capital flight, in the sense that a firm physically moves its production abroad. This added option turns out to be crucial for the analysis. Section 6 offers some concluding remarks.

## 2 The model

Consider an industry where, initially, three firms (single-plant owners) each produce a single (differentiated) good for a common international market. Two of the firms (1 and 2) are located in the 'domestic' country, whilst the third firm is located elsewhere. We have in mind an international market where domestic consumption is negligible relative to global consumption. Thus, for simplicity, we abstract from domestic consumption altogether by applying a pure third-market model. The inverse demand facing Firm  $i$  is given by

$$p_i = a - q_i - b \sum_{j \neq i} q_j, \quad (1)$$

where  $a$  is a positive constant,  $b \in (0, 1)$  is an inverse measure of the degree of product differentiation, and  $q_i$  is supplied quantity of variety  $i$ .

The firms have similar technologies, characterised by a Leontief production function of the form  $q_i = \min\{l_i, k_i\}$ , where  $l_i$  and  $k_i$  are, respectively, the labour and capital employed by Firm  $i$ . Labour costs are  $w_i$  and capital costs are  $c(1 - \sigma_i)$  per unit. Firm  $i$ 's marginal costs are thus given by

$$m_i = w_i + c(1 - \sigma_i), \quad (2)$$

where  $\sigma_i$  is a binary variable reflecting exogenous domestic merger synergies. We assume that a domestic merger yields an exogenous marginal cost saving equal to  $\sigma c$ , where  $\sigma \in [0, 1]$ .<sup>10</sup> Thus, the variable  $\sigma_i$  is defined as

$$\sigma_i = \begin{cases} \sigma & \text{if Firm } i \text{ participates in a domestic merger} \\ 0 & \text{otherwise} \end{cases}. \quad (3)$$

We assume that domestic firms face an industry-wide monopoly trade union, while the foreign firm, operating in a non-unionised environment, has access to labour at a wage rate  $\bar{w} < a - c$ . We want to portray a situation where domestic (unionised) firms have a cost disadvantage, and this is most easily done by setting the domestic reservation wage equal to  $\bar{w}$ .

The domestic union is a rent-maximiser. With the added assumption that the union is able to set different wages at different domestic firms/plants, union utility is given by

$$U = \sum_{i \in N} (w_i - \bar{w}) q_i, \quad (4)$$

where  $N$  is the set of domestic plants. We apply the traditional monopoly union framework, where wages are unilaterally set by the monopoly trade union prior to the firms' employment decisions. The firms are assumed to compete in quantities á la Cournot, with profits from plant  $i$  given by

$$\pi_i = (p_i - m_i) q_i. \quad (5)$$

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<sup>10</sup>We want to depict a situation where a domestic merger yields higher exogenous costs savings than does a cross-border merger. This is most easily represented by assuming that *only* a domestic merger yields exogenous cost savings.



### 3 Domestic versus cross-border merger

We assume that, in addition to the benchmark oligopoly market structure, there are two feasible merger options in the industry: a domestic merger or a cross-border merger. For simplicity, assume that both options involve Firm 1.<sup>11</sup> In other words, we let Firm 1 choose between merging domestically with Firm 2 or merging cross-border with Firm 3.<sup>12,13</sup> In order to solve for the equilibrium market structure, we apply the endogenous merger formation model of Horn and Persson (2001b), where the merger process is treated as a cooperative game where the merger candidates are free to communicate and write binding contracts. Using the core as solution concept, an *equilibrium market structure* is a market structure that is *undominated*, in terms of joint profits of the *decisive owners*, by any other possible market structure. Allowing for side payments within, but not between, coalitions, the decisive owners are the group of owners that are able to influence whether market structure  $\mathcal{M}_i$  will be formed instead of  $\mathcal{M}_j$ , and vice versa. More precisely, the group of decisive owners, when comparing  $\mathcal{M}_i$  and  $\mathcal{M}_j$ , are the owners that belong to different coalitions in  $\mathcal{M}_i$  and  $\mathcal{M}_j$ .<sup>14</sup> In our specific case, there are three market structures to consider: oligopoly ( $\mathcal{M}_O$ ), domestic merger ( $\mathcal{M}_D$ ) and cross-border merger ( $\mathcal{M}_C$ ).

#### 3.1 Merger effects on domestic wages and employment

Before solving for the equilibrium market structure, let us first see how different types of mergers affect domestic wages and employment. The Nash equilibrium outcomes, in terms of production (employment), wages and profits, are reported, for each market structure, in the Appendix. Letting  $w_i^k$  denote the equilibrium wage level at plant  $i$  in market structure

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<sup>11</sup>Even though we shortly will introduce elements from endogenous merger theory, fixing attention on the possibilities of one particular firm is reminiscent of the traditional exogenous merger theory in the path of Salant, Switzer and Reynolds (1983) and Deneckere and Davidson (1985).

<sup>12</sup>In line with previous related literature, we exclude the possibility of full monopolisation of the industry. A market structure involving a merger among all firms is both less interesting and, in any case, unlikely to be sanctioned by antitrust authorities.

<sup>13</sup>We assume that, post-merger, it is not possible to move the production of one brand from one plant to another. Thus, the quintessence of a merger is a coordination of output decisions among the merger participants.

<sup>14</sup>See Horn and Persson (2001b) for details of the theoretical underpinnings, including a formal definition of *decisive owners*.

$\mathcal{M}_k$ , we derive a clear-cut ranking of wage level across the different market structures:

**Proposition 1**  $w_i^D \geq w_i^O = w_2^C > w_1^C$ ,  $i = 1, 2$ .

Compared with the benchmark oligopoly equilibrium, only a domestic merger will lead to a wage increase (for  $\sigma > 0$ ). A cross-border merger, on the other hand, will lead to reduced wages, but only at the domestic plant of the merged firm. Although the model set-up is somewhat different, the intuition for these results is for the most part similar to what is explained in great detail in Lommerud, Straume and Sørgaard (2006). Here, we will just summarise the main mechanisms. A cross-border merger allows, to a certain extent, the merged unit to replace domestic (high-cost) production with foreign (low-cost) production.<sup>15</sup> This increases the labour demand elasticity at the domestic plant and forces the domestic union to lower the wage in order to mitigate job losses. The strength of this effect depends on the degree of product differentiation. The less differentiated products are, the easier (less costly) it is for the merged unit to replace domestic with foreign production. Thus, a cross-border merger works as a wage disciplining device towards the domestic trade union, and more so the less differentiated the products of the merging parties. A domestic merger, on the other hand, does not have this effect on union wage demand, since the trade union controls labour supply at both plants. In fact, in the absence of any exogenous merger synergies, a domestic merger has no effect on union wage demand.<sup>16</sup> However, when there are other variable cost synergies of a merger, there will be a positive labour demand response causing wages to increase. Thus, for  $\sigma > 0$ , a domestic merger leads to higher wages.

The corresponding domestic employment effects of merger depend, in part, on the size of the domestic merger synergies. Let  $L^k := \sum_{i \in N} l_i^k$  denote total employment at domestic plants in market structure  $\mathcal{M}_k$ . Furthermore, let  $S := \frac{\sigma c}{a - \bar{w} - c}$  be a measure of exogenous domestic merger synergies. Three different scenarios can be identified:

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<sup>15</sup>Note that this does not imply that production capacity is moved from one country to another, which is blocked by assumption. Rather, it is to some extent possible to meet market demand by scaling up production at the low-cost location and scaling down where costs are higher. Remember that the products at different locations are only imperfect substitutes, which offers some degree of shelter from competition to the high-cost provider.

<sup>16</sup>This is a quite general result; see Dhillon and Petrakis (2002).

**Proposition 2** (i) If  $S \leq \frac{b}{4}$ , then  $L^O > L^C \geq L^D$ ,

(ii) If  $S \in \left(\frac{b}{4}, \frac{b}{2(1+b)}\right]$ , then  $L^O \geq L^D > L^C$ ,

(iii) If  $S > \frac{b}{2(1+b)}$ , then  $L^D > L^O > L^C$ .

Compared with the benchmark oligopoly equilibrium, a cross-border merger always reduces domestic employment. Thus, the wage drop at the domestic plant is not sufficient to fully compensate for the drop in domestic labour demand. The employment effect of a domestic merger, on the other hand, depends crucially on the amount of cost synergies. If these are small, a domestic merger will reduce employment even more than a cross-border merger. On the other hand, for sufficiently large cost synergies, the market structure with a domestic merger yields the highest level of domestic employment.

### 3.2 Equilibrium market structure

In our specific model, for a market structure involving a merger to be undominated, and thus constitute an equilibrium market structure, two conditions must be jointly fulfilled: (i) the merger must be privately profitable for the merger participants, and (ii) the merger must generate higher total industry profits than in any of the alternative market structures. The second condition follows from the fact that, when comparing the two market structures involving a merger,  $\mathcal{M}_C$  and  $\mathcal{M}_D$ , all three owners are *decisive*. Assuming that antitrust authorities will allow any of the two considered merger proposals, the following result obtains:

**Proposition 3** *Under a laissez-faire merger policy, there is always a merger in equilibrium. The equilibrium market structure is  $\mathcal{M}_C$  ( $\mathcal{M}_D$ ) if  $S < (>) S_1$ , where*

$$S_1 := \frac{3b + 3b^2 - b^3 - 2 + \sqrt{8 + (2 - b)b(3b^2(3 + b - b^2) - 2)}}{2(b + b^2 + 1)}. \quad (6)$$

A formal proof simply contains straightforward profit comparisons between different market structures and is thus omitted. It is more instructive to go through the different steps of the proof intuitively. Due to the wage-reducing effect of a cross-border merger,

such a merger is always privately profitable and, naturally, also increases total industry profits. Thus, we can rule out the benchmark oligopoly as an equilibrium outcome of the merger process. Whether Firm 1 will merge cross-border or domestically depends on which type of merger that generates higher industry profits. This depends, in turn, on the magnitude of cost savings. Since a cross-border merger induces a wage cut, while a domestic merger leads to a wage increase, the latter type of merger yields higher industry profits only if the exogenous merger synergies are sufficiently large; more precisely, if  $S > S_1$ . A merger synergy of this magnitude also ensures that the domestic merger is privately profitable. A closer scrutiny of the threshold value,  $S_1$ , reveals that it is positive and increasing in  $b$ . Thus, the scope for a domestic merger is lower in industries with a low degree of product differentiation. The reason is that the wage disciplining effect of a cross-border merger is higher the lower the degree of product differentiation, implying that the attractiveness of such a merger is increasing in  $b$ .

## 4 Domestic merger policy

Let us now introduce a domestic policy towards mergers. We assume that the domestic policy maker is concerned about allocating industry rents to the domestic country. Since corporate shareholding is usually highly diversified and global, and profits are difficult to tax, it is reasonable to assume that the policy maker places a considerably larger weight on the rents accruing to domestic workers.<sup>17</sup> We take this argument to the extreme by assuming that the objective of the domestic policy maker is simply to maximise domestic union rents, i.e., domestic welfare in market structure  $\mathcal{M}_k$  is given by  $W^k := U^k$ .

By comparing the different market structures we can identify two alternative welfare rankings, depending on whether domestic merger synergies are below or above a certain

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<sup>17</sup>This can be debated, but remember that we primarily want to show that national champion merger policy can be problematic even in an environment that on the surface seems very favourable for such a policy. Then this is the natural assumption.

threshold level. Let

$$S_2 := \frac{\sqrt{(2-b)(1+b)(2+2b-b^2)} - 2 - b + b^2}{2+2b}. \quad (7)$$

It is straightforward to verify that  $\partial S_2/\partial b > 0$  on the interval  $(0, 1)$  and that  $\lim_{b \rightarrow 1} S_2 = \frac{1}{2} \left( \frac{\sqrt{2}\sqrt{3}}{2} - 1 \right) \approx 0.11$ . We can then make the following domestic welfare rankings:

**Proposition 4** (i) If  $S \leq S_2$ , then  $W^O \geq W^N > W^C$ ;

(ii) If  $S > S_2$ , then  $W^N > W^O > W^C$ .

A cross-border merger is always the least preferred market structure, from the viewpoint of the domestic policy maker, due to the merger-induced downward pressure on domestic wages. A domestic merger, on the other hand, enables the domestic wage level to increase, while the employment effect is ambiguous. This is the most preferred market structure if the exogenous cost synergies are sufficiently high. The implications for optimal merger policy is straightforward:

**Corollary 1** A cross-border merger proposal will never be accepted. A domestic merger proposal will be accepted if the merger synergies are sufficiently high:  $S > S_2$ .

If domestic merger synergies are low ( $S < S_2$ ), all merger proposals will be declined. Otherwise, for  $S > S_2$ , the domestic policy maker will decline a cross-border merger proposal but accept a domestic merger proposal. In the following, we will refer to this as a *national champion policy*.

How is the domestic merger policy going to affect the equilibrium market structure? Ruling out the possibility of cross-border merger, we are left with only two possible market structures:  $\mathcal{M}_O$  or  $\mathcal{M}_D$ . The equilibrium is then simply determined by the private profitability of a domestic merger. The relevant profit comparison shows that a domestic merger is profitable if

$$S > S_3 := \frac{\sqrt{(b+1)^3(2+2b-b^2)} - (2-b)(b+1)^3}{2(b+1)^3}. \quad (8)$$

It is straightforward to verify that  $S_3 < S_2 < S_1$  for all  $b \in (0, 1)$ . This enables us to characterise the optimal domestic merger policy and its effects as follows:

**Proposition 5** (i) *If  $S \leq S_2$ , the optimal policy is to decline all merger proposals. The outcome is oligopoly instead of a cross-border merger.*

(ii) *If  $S_2 < S \leq S_1$ , the optimal policy is a national champion policy. The outcome is a domestic merger instead of a cross-border merger.*

(iii) *If  $S > S_1$ , merger policy is redundant. The outcome is a domestic merger in any case.*

In terms of deriving a rationale for a national champion policy, Regime (ii) is clearly the interesting case. It shows that, for intermediate levels of domestic merger synergies, a national champion policy is both optimal *and* effective: by blocking any cross-border merger proposals, a domestic policy maker can induce a domestic merger, thereby increasing domestic welfare.

## 5 Capital flight

Assume now that, in addition to the two merger alternatives, Firm 1 has a third feasible option: capital flight. Consider the case where Firm 1 can set up a plant in a foreign non-unionised location at a fixed investment cost  $f$ . We assume that such a relocation of production will give the investing firm access to labour at a wage rate  $\bar{w}$ . The relocated firm continues to produce the same variant of the product in question as before, so the degree of product differentiation among the products of the three plants remain the same. The relocation option creates a fourth possible market structure, denoted  $\mathcal{M}_F$ , with an oligopoly consisting of one high-cost (unionised) and two low-cost (non-unionised) firms.<sup>18</sup>

Let us first see how capital flight affects domestic wages and employment, compared with the previously discussed market structures. Again, using the equilibrium expressions

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<sup>18</sup>In order to keep the analysis reasonably simple and focussed, we rule out the possibility of *combining* two of the options; i.e., we rule out the possibility of merging *and* relocating production.

reported in the Appendix, the effect of capital flight by one of the domestic firms can be characterised as follows:

**Proposition 6** (i) *Compared with the benchmark oligopoly outcome, capital flight by one domestic firm causes the wage level in the remaining domestic firm to drop to a level  $w^F \in (w_1^C, w_i^O)$ . (ii) Compared with all other market structures, capital flight always reduces domestic employment.*

If we compare with the benchmark oligopoly, capital flight by one domestic firm implies that the remaining domestic firm faces tougher competition, since it becomes the only high-cost firm in the industry. This, in turn, induces the union to lower its wage demand in order to stimulate domestic employment. However, in terms of total domestic employment, the direct job losses brought about by capital flight can, unsurprisingly, never be compensated for by the remaining domestic firm.

## 5.1 Laissez-faire equilibria

How is the option of capital flight for Firm 1 going to affect the equilibrium market structure? The capital flight option can be incorporated straightforwardly into the Horn-Persson framework. Each of the previously considered market structures must now be compared with the capital flight option. For example,  $\mathcal{M}_D$  will dominate  $\mathcal{M}_F$  if it is possible for Firm 2 and Firm 1 to agree on a domestic merger deal that makes both firms better off than if Firm 1 decides to flee the country. In other words,  $\mathcal{M}_D$  dominates  $\mathcal{M}_F$  if  $\pi_1^D + \pi_2^D > \pi_1^F + \pi_2^F$ , and *vice versa*. For capital flight to occur in equilibrium, this option must obviously also be privately profitable for Firm 1, i.e.,  $\pi_1^F > \pi_1^O$ .

In order to derive the equilibrium outcome, we need to make use of the following partial results:

### 5.1.1 The profitability of capital flight

The private profitability of capital flight obviously depends on the magnitude of relocation costs. A simple profit comparison reveals that  $\pi_1^F > \pi_1^O$  if

$$f < f_1 := \frac{(2b+3)(a-\bar{w}-c)^2}{4(b+1)(b+2)^2}. \quad (9)$$

Since  $\partial f_1 / \partial b < 0$  on the interval  $(0, 1)$ , it follows that capital flight is less likely to be a profitable option the less differentiated products are. This is quite intuitive, since less differentiation (i.e., more competition) reduces domestic wages and thereby reduces the gain of capital flight.

### 5.1.2 Capital flight versus domestic merger

In qualitative terms, a domestic merger yields higher profits for the domestic firms if the ratio between merger synergies and relocation costs is sufficiently high. Since the threshold level of merger synergies is monotonically decreasing in  $f$ , we can consider the following two extreme cases: First, if  $f = f_1$ , then  $\pi_1^D + \pi_2^D > \pi_1^F + \pi_2^F$  if

$$S > S_4^L := \sqrt{\frac{1}{2(b+1)^5}} (1+b)(2+2b-b^2) + \frac{b}{2} - 1. \quad (10)$$

Second, if  $f = 0$ , then  $\pi_1^D + \pi_2^D > \pi_1^F + \pi_2^F$  if

$$S > S_4^H := \frac{\sqrt{2}(2+2b-b^2)\sqrt{(14b+5b^2+10)(b+1)^3}}{2(b+2)(b+1)^3} - \frac{(2-b)}{2}. \quad (11)$$

Obviously,  $S_4^H > S_4^L$  for all  $b \in (0, 1)$ , and we can thus establish three different regions of merger synergies:

- (i) If  $S < S_4^L$ , then  $\pi_1^D + \pi_2^D < \pi_1^F + \pi_2^F$  for all  $f \in (0, f_1)$ ;
- (ii) If  $S \in (S_4^L, S_4^H)$ , then  $\pi_1^D + \pi_2^D > (<) \pi_1^F + \pi_2^F$  if  $f > (<) \hat{f}$ , where  $\hat{f} \in (0, f_1)$ ;
- (iii) If  $S > S_4^H$ , then  $\pi_1^D + \pi_2^D > \pi_1^F + \pi_2^F$  for all  $f \in (0, f_1)$ .

Notice also that both  $S_4^L$  and  $S_4^H$  are decreasing in  $b$  on  $(0, 1)$ , reflecting the generally



lower attractiveness of capital flight in industries with more intense competition.

### 5.1.3 Capital flight versus cross-border merger

Compared with capital flight by Firm 1, a cross-border merger yields higher joint profits for the merger candidates if the relocation costs are sufficiently high. More precisely,  $\pi_1^C + \pi_3^C < \pi_1^F + \pi_3^F$  if

$$f > f_2 := \frac{(48 + 128b - 4b^2 - 212b^3 - 86b^4 + 84b^5 + 37b^6 - 10b^7 - 3b^8)(a - \bar{w} - c)^2}{16(b+2)^2(b+1)^2(2+2b-b^2)^2}. \quad (12)$$

It is straightforward to verify that  $\partial f_2 / \partial b < 0$  on  $(0, 1)$ . Furthermore,  $f_2 < 0$  if  $b > 0.94$ . This means that, even if capital flight is costless, a cross-border merger still yields higher joint profits if products are close to homogeneous ( $b > 0.94$ ). Not only is the gain of capital flight lower in industries with little product differentiation, but the effectiveness of cross-border merger, in terms of reducing domestic wages, is that much higher.

We are now ready to characterise the market structure equilibria, assuming again that any of the two considered merger proposals will always be sanctioned by antitrust authorities.

**Proposition 7** *Under a laissez-faire merger policy, the following equilibria can be identified:*

(i) *If  $S > \max\{S_4^H, S_1\}$ , the unique equilibrium market structure is  $\mathcal{M}_D$  for all  $b \in (0, 1)$  and  $f \geq 0$ .*

(ii) *If  $S < \bar{S}$  and  $f < f_2$ , where  $\bar{S} \in (S_4^L, S_4^H)$  for  $b < 0.94$  and  $\bar{S} > S_4^H$  for  $b > 0.94$ , the unique equilibrium market structure is  $\mathcal{M}_F$  for all  $b \in (0, 1)$ .*

(iii) *If  $S < S_1$  and  $f > f_2$ , the unique equilibrium market structure is  $\mathcal{M}_C$  for all  $b \in (0, 1)$ .*

**Proof.** (i) By noting that  $\max\{S_4^H, S_1\} > S_3$ , the proof follows from the above analysis.

(ii) Since  $f_2 < f_1$  for all  $b \in (0, 1)$ ,  $f < f_2$  is always the relevant restriction. The upper bound on domestic merger synergies,  $\bar{S}$ , is then determined as the solution to  $\pi_1^D(\bar{S}) + \pi_2^D(\bar{S}) = \pi_1^F(f_2) + \pi_2^F$ , explicitly given by

$$\bar{S} := \frac{\sqrt{112b + 156b^2 + 56b^3 - 62b^4 - 34b^5 + 7b^6 + 3b^7 + 32}}{2(b+2)(b+1)} - \frac{(2-b)}{2}. \quad (13)$$

(iii) Since a cross-border merger is always privately profitable (compared with the benchmark oligopoly), the two stated conditions are necessary and sufficient. ■

## 5.2 The scope for a national champion policy

The interesting question in this context is how the possibility of capital flight affects the optimal domestic merger policy; in particular, if and how it affects the scope for a national champion policy. Notice first that, in terms of domestic welfare, capital flight is always the worst outcome, since it leads to severe job losses *and* lower wages for the remaining domestic workers. However, it would be highly unreasonable to assume that the domestic policy maker is able directly to prevent Firm 1 from fleeing the country and relocating production elsewhere. Thus, if  $f < f_1$ , domestic merger policy cannot be used to prevent industrial restructuring, it can only be used to influence the type of industrial restructuring that takes place. Let us first define the cases where merger policy plays no role:

**Proposition 8** *If the laissez-faire equilibrium market structure is either  $\mathcal{M}_D$  or  $\mathcal{M}_F$ , domestic merger policy is always either redundant (in the former case) or ineffective (in the latter case).*

**Proof.** Using Proposition 7, the former result follows from the fact that  $\max\{S_4^H, S_1\} > S_2$  for all  $b \in (0, 1)$ . The latter result is obvious. ■

Thus, the most interesting case is when the laissez-faire equilibrium market structure involves a cross-border merger,  $\mathcal{M}_C$ . Let us make the additional assumption that capital flight is always privately profitable, i.e.,  $f < f_1$ . In this case, it can never be an optimal policy to block a domestic merger, since this alternative is always better, in terms of

domestic welfare, than the relevant alternatives: cross-border merger or capital flight. Thus, the only active merger policy that is potentially optimal is a national champion policy where the policy maker blocks any cross-border merger proposals in order to induce the domestic firms to merge instead. The following proposition characterises the scope for a national champion policy in this particular case:

**Proposition 9** *Assume that the laissez-faire equilibrium market structure is  $\mathcal{M}_C$  and that capital flight is privately profitable, i.e.,  $S < S_1$  and  $f \in (f_2, f_1)$ . The scope for a national champion policy is then the following:*

(i) *If  $S \in (\bar{S}, S_1)$ , a national champion policy is effective and optimal for all  $f \in (f_2, f_1)$ . This set is non-empty only if  $b > 0.20137$ .*

(ii) *If  $S < S_4^L$ , a national champion policy is both ineffective and counterproductive for all  $f \in (f_2, f_1)$ . A laissez-faire merger policy is welfare superior.*

(iii) *If  $S \in (S_4^L, \min\{\bar{S}, S_1\})$ , a national champion policy is effective and optimal if  $f$  is sufficiently high, and ineffective and counterproductive otherwise. In the latter case, a laissez-faire merger policy is welfare superior.*

**Proof.** When the domestic policy maker adopts a national champion policy, and given that  $f < f_1$ , the equilibrium market structure is determined by the dominance ranking (in terms of joint domestic profits) of  $\mathcal{M}_D$  and  $\mathcal{M}_F$ . Thus, the proof of part (i) follows from the proof of part (ii) of Proposition 7, while the proof of part (ii) follows directly from the derivation of (13). By construction, part (iii) follows then automatically. It is straightforward to verify that the set  $(S_4^L, \min\{\bar{S}, S_1\})$  is non-empty for all  $b \in (0, 1)$ . The stated implications for optimal merger policy follows from the fact that capital flight is always the least desirable outcome, from a domestic welfare perspective. ■

A national champion policy is certain to work only if domestic merger synergies are sufficiently large and, in addition, products are not too differentiated. Otherwise, it might be both ineffective and counterproductive. *Ineffective*, because blocking a cross-border merger will not induce a domestic merger, and *counterproductive*, because it will induce an outcome that is even worse for the policy maker, namely capital flight. If domestic

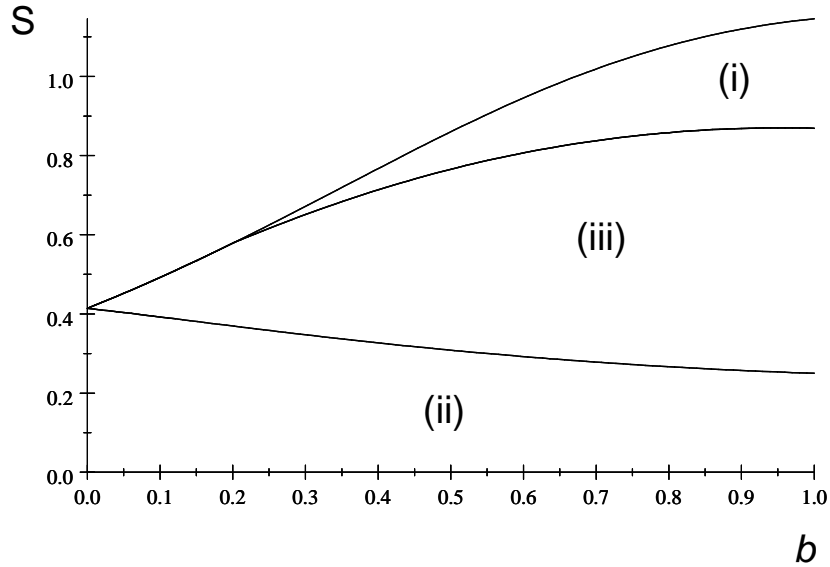


Figure 1: The scope for a national champion policy

merger synergies are sufficiently low,  $S < S_4^L$ , this will always be the case.

Notice that, since  $\bar{S} (S_1)$  is monotonically decreasing (increasing) in  $b$ , the scope for a national champion policy is inversely related to the degree of product differentiation in the industry. A national champion policy is relevant only if the laissez-faire equilibrium market structure is  $\mathcal{M}_C$ , and such a policy is optimal only if it induces a domestic merger (the ‘good’ outcome) rather than capital flight (the ‘bad’ outcome). As previously discussed, the gains of a cross-border merger are higher in industries with less differentiated products, implying that  $\mathcal{M}_C$  is an equilibrium outcome for a larger set of parameter configurations, increasing the relevance of a national champion policy. At the same time, we know that less differentiated products (implying stronger competition) reduces, all else equal, the incentive for capital flight. This increases the likelihood that the most attractive alternative to a cross-border merger is a domestic one, rather than capital flight by Firm 1. Thus, the scope for a national champion policy is larger in industries with less product differentiation, and vice versa.

An illustration of the three different regimes from Proposition 9 (with a corresponding labelling of regimes) is given in Figure 1. Domestic merger synergies are measured on the

vertical axis, while product differentiation is inversely measured on the horizontal axis. Only in area (i) is a national champion policy always effective and optimal. In area (ii), a national champion policy is not only ineffective, but also counterproductive: By blocking a cross-border, the result will be capital flight, which is an even worse outcome in terms of domestic welfare. In area (iii), a national champion policy is effective and optimal if relocation costs are sufficiently high, and ineffective and counterproductive otherwise. We see that the scope for a national champion policy is clearly increasing in the parameter  $b$ .

### 5.3 Globalisation

Finally, since the analysis is cast in the setting of global market competition, we would like to indulge in some speculation about how our results would be affected by globalisation. We can use our model to discuss two particular interpretations (with corresponding measures) of globalisation which, as we argue below, have opposite effects with respect to the scope for a national champion policy.

One interpretation of globalization is that it leads to fiercer product market competition. As in Blanchard and Giavazzi (2003) we can think of the differentiation parameter  $b$  as a measure of the degree of competition between firms.<sup>19</sup> We have already analysed and discussed the effect of the parameter  $b$ ; from the above analysis, and with this particular interpretation, it follows that globalisation increases the scope for a national champion policy.

However, another standard interpretation of globalisation is market integration, typically modelled as market expansion.<sup>20</sup> In our parameterised model, this corresponds most closely to an increase in the demand parameter  $a$ . How does this affect our results? This is most easily seen with respect to Figure 1. Remember that our measure of domestic merger

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<sup>19</sup>Within a framework of monopolistic competition, Blanchard and Giavazzi make this interpretation on the parameter measuring the elasticity of substitution in a CES demand function, but there is of course a clear analogy to the differentiation parameter in a linear demand system. It is important to stress, though, that by interpreting a parameter change in a demand system as a result of globalisation (or other institutional changes), one should think of the parameter, in our case  $b$ , not as a taste parameter in a utility function but rather interpret the underlying utility function as a reduced form reflecting the substitutability among products.

<sup>20</sup>See also Lommerud, Meland and Straume (2005).

synergies are defined as  $S := \frac{\sigma c}{a-w-c}$ . An increase in  $a$  therefore implies a reduction in  $S$ , increasing the likelihood that the relevant region is (ii), rather than (i). Thus, with this particular interpretation, globalisation reduces the scope for a national champion policy. The reason is simply that, since the cost of capital flight is fixed, a demand increase makes this option more attractive relative to a domestic merger. This consequently increases the likelihood that a national champion policy will be ineffective and counterproductive.

## 6 Concluding Remarks

The ongoing process of investment liberalisation has made international mergers much more commonplace than they were just some few years ago. The purpose of this paper has been to discuss if national champion type merger policies can be made sense of in a rather standard model of international unionised oligopoly. We have chosen assumptions that consistently seem to favour a national champion argument: International mergers depress unionised wages, domestic mergers entail larger non-wage variable cost synergies than do international ones, policy makers care more for domestic workers than for domestically residing capital owners. This approach, of course, only makes sense if one wants to argue that even in such a benign environment national champion policies can seriously backfire.

We first investigate a model where a given domestic firm only has three options: to merge cross-border, to merge domestically, or not to engage in a merger. Then a national champion policy can make sense, in particular when the cost synergies associated with domestic merger are large enough. (But if these cost savings are very large, national champion policy becomes redundant, since the outcome would be domestic merger even in the absence of policy.)

However, the chief innovation of the paper is to introduce a fourth alternative for the given domestic firm, namely to move all production to a non-unionised location – but then also carrying a presumably large fixed cost of relocation.<sup>21</sup> This drastically reduces the

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<sup>21</sup>Much research has studied either the choice between domestic or cross-border merger, or the choice between cross-border merger and greenfield FDI, but it seems obvious that all these options should ideally be studied simultaneously. The current paper is a first step in this direction.

scope for a ban on international mergers. For many parameter constellations a national champion policy will be what we dub ‘ineffective and counterproductive’. This means that blocking an international merger will not produce the desired alternative, namely a domestic merger. Instead this will provoke an outcome that is even worse for the policy maker, namely capital flight.

However the scope for economic patriotism in merger policy is only reduced, not eliminated by the introduction of the capital flight option. Three key parameters in the model are the size of the domestic merger synergies, the degree of product differentiation among the products of the oligopolists and the fixed relocation cost. The paper pursues this in detail, but generally speaking, relatively high domestic non-labour cost synergies and a low degree of product differentiation can save the national champion argument. The same applies for a high fixed cost of greenfield investment, which to some extent only amounts to blocking the relocation option again. We know of no systematic investigation of when and where economic patriotism seemingly has influenced merger decisions, but we have an impression that several well-known examples (as most of those mentioned in the introduction) concerns infrastructure industries, where relocation of production can be extremely expensive – and where products often are little differentiated.

The fact that the analysis of this paper seems to warn that national champion policies may be futile does not mean that international mergers are beneficial. Within the model, international mergers can be harmful because they hurt the position of unionised workers without realising the non-labour costs savings that a domestic merger would offer (by assumption). One can easily understand that policy makers would worry about this, but national champion merger policy is only the correct solution in special circumstances.

It is hard to come up with an alternative, realistic policy option that would put things right. The model presents a picture of ‘ordinary workers’ in affluent countries that owe their good fortune first to the fact that the firms they work in have some market power, and second to the fact that these workers in turn manage to capture some of the profit created by this market power. In a globalising world where both trade and investments are

liberalised it will probably be difficult to base a country's prosperity on market power in some sense. In particular, it will probably become increasingly hard to cage capital in so that organised labor can secure their share of the spoils. This is exactly what this paper is about: banning cross-border mergers is an attempt to lock capital to one particular economy, but this does not work unless one can cage capital in completely by also banning the physical relocation of investments. Perhaps policy makers should realise this, and that the essential point to keep a country prosperous in the longer term is to make sure that the inhabitants of that country are so highly productive that high wages can be sustained also in the absence of any market power.



## Appendix

Below we report explicit expressions for equilibrium production, wages, profits and union rents in the different market structures.

**Benchmark oligopoly ( $\mathcal{M}_0$ ):**

$$\begin{aligned}
 q_1^0 &= q_2^0 = \frac{a - c - \bar{w}}{4(1 + b)}, \\
 q_3^0 &= \frac{(2 + b)(a - \bar{w} - c)}{4(1 + b)}, \\
 w_1^0 &= w_2^0 = \frac{(2 - b)(a - c) + (2 + b)\bar{w}}{4}, \\
 \pi_1^0 &= \pi_2^0 = \frac{(a - \bar{w} - c)^2}{16(1 + b)^2}, \\
 \pi_3^0 &= \frac{(2 + b)^2 (a - \bar{w} - c)^2}{16(1 + b)^2}, \\
 U^0 &= \frac{(2 - b)(a - c - \bar{w})^2}{8(1 + b)}.
 \end{aligned}$$

**Domestic merger ( $\mathcal{M}_D$ ):**

$$\begin{aligned}
 q_1^D &= q_2^D = \frac{(2 - b)(a - c - \bar{w}) + 2c\sigma}{4(2 - b^2 + 2b)}, \\
 q_3^D &= \frac{(4 + 2b - b^2)(a - c) - (4 + 2b - b^2)\bar{w} - 2c\sigma b}{4(2 - b^2 + 2b)}, \\
 w_1^D &= w_2^D = \frac{(2 - b)(a - c) + (2 + b)\bar{w} + 2c\sigma}{4}, \\
 \pi_1^D &= \pi_2^D = \left( \frac{1 + b}{16} \right) \left( \frac{(2 - b)(a - c - \bar{w}) + 2c\sigma}{2 - b^2 + 2b} \right)^2, \\
 \pi_3^D &= \frac{[(4 + 2b - b^2)(a - c - \bar{w}) - 2bc\sigma]^2}{16(2 + 2b - b^2)^2}, \\
 U^D &= \frac{[(2 - b)(a - c - \bar{w}) + 2c\sigma]^2}{8(2 - b^2 + 2b)}.
 \end{aligned}$$

**Cross-border merger ( $\mathcal{M}_C$ ):**

$$q_1^C = \frac{(2-b)(a-\bar{w}-c)}{4(2-b^2+2b)},$$

$$q_2^C = \frac{(a-\bar{w}-c)}{2(2-b^2+2b)},$$

$$q_3^C = \frac{(4-b^2+b)(a-\bar{w}-c)}{4(2-b^2+2b)},$$

$$w_1^C = \frac{(1-b)(a-c) + (1+b)\bar{w}}{2},$$

$$w_2^C = \frac{(2-b)(a-c) + (2+b)\bar{w}}{4}$$

$$\pi_1^C + \pi_3^C = \frac{(20b+20-10b^2-8b^3+3b^4)(a-\bar{w}-c)^2}{16(2-b^2+2b)^2},$$

$$\pi_2^C = \frac{(a-c-\bar{w})^2}{4(2+2b-b^2)^2},$$

$$U^C = \frac{(2-b)^2(a-\bar{w}-c)^2}{8(2-b^2+2b)}.$$

**Capital flight ( $\mathcal{M}_F$ ):**

$$q_1^F = q_3^F = \frac{(4+3b)(a-\bar{w}-c)}{4(1+b)(2+b)},$$

$$q_2^F = \frac{a-c-\bar{w}}{4(1+b)},$$

$$w_2^F = \frac{(2-b)(a-c) + (2+3b)\bar{w}}{2(2+b)},$$

$$\pi_1^F = \pi_3^F - f = 1 - \frac{(4+3b)^2(a-\bar{w}-c)^2}{16(1+b)^2(2+b)^2} - f,$$

$$\pi_2^F = \frac{(a-c-\bar{w})^2}{16(1+b)^2},$$

$$U^F = \frac{(2-b)(a-c-\bar{w})^2}{8(1+b)(2+b)}.$$

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