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National Champion Versus Foreign Takeover

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Jens Südekum*

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Abstract
Governments in several countries have recently spent considerable effort to defend domestic firms against acquisition attempts from abroad and instead favoured mergers among national firms. In this paper we offer an explanation why globalization can reinforce the case for promoting "national champions". We analyze an oligopolistic market where a domestic and a foreign firm are engaged in a takeover battle for a domestic competitor. Any merger or acquisition (M&A) must be approved by the national government whose objective function may include a bias against the foreign takeover. That bias endogenously results from lobbying efforts of the domestic firm that would become the outsider in the foreign acquisition scenario. In the case where the government is unbiased and only cares about welfare we find that falling trade barriers trigger the cross-border acquisition. However, when the domestic government cares sufficiently strongly about lobbying contributions, globalization has a qualitatively different effect. The foreign takeover would then only emerge in an intermediate range of trade costs. Once trade integration reaches a critical level the biased government starts to block the foreign takeover and instead opens the door for the national champion.

JEL Classification: F12, F23, L13, L52

Keywords: Mergers, takeovers, national champions, international trade, trade integration, economic patriotism

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1) Introduction

Cross-border M&A have become vastly more important over the last decades, during an ongoing process of falling trade barriers and globalization.[1] Yet, despite this general development, there have also been a number of recent merger cases that reveal a somewhat opposite trend: The increased effort by governments to defend domestic firms against acquisition attempts from abroad. For example, the French government has heavily opposed the announced takeover of the national electricity and gas company *SUEZ* by the Italian competitor *ENEL*. Instead it favoured a merger of *SUEZ* with *GAZ DE FRANCE* (GdF), in order to create one of the largest gas providers worldwide with headquarters based in France.[2] This policy approach of creating so-called *national champions* is clearly confined to specific circumstances where foreign corporations train their sight on prominent and large domestic target firms which are often active in sensible sectors of the economy. Still, the cases where governments have intervened in multinational takeover battles and pushed domestic mergers have attracted huge public and business attention, which suggests that the national champion debate is one of the key issues in current industrial and competition policy. In this paper we offer an explanation why falling trade costs (globalization) may on the one hand reinforce cross-border mergers, while on the other hand they can also strengthen the case for promoting national champions.

We set up an oligopoly model where two domestic and one foreign firm compete in the domestic country. The foreign firm may produce at lower unit costs than the national competitors, but it faces trade costs for servicing the market. Starting from this initial situation changes in the ownership structure through M&A are envisaged. In particular, the foreign firm wants to take over one of the domestic firms in order to improve its market access. Alternatively, the two domestic firms may merge to become a national champion, which captures market shares from the foreign rival. These two alternatives represent the relevant possibilities in many real world cases: E.g., should *SUEZ* merge with *GdF*, or should it be taken over by *ENEL*? The takeover battle is modelled as an auction between the foreign and one domestic bidder for the (pre-determined) domestic target, similar as in Norbäck and Persson (2004) or in Inderst and Wey (2004). Yet, in this paper we assume that any change in the ownership structure of that industry must also be approved by the domestic government.

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[1] Cross-border M&A are the dominant form of foreign direct investment, far more important than greenfield investments. During the 1980s they accounted for roughly 77 per cent of all FDI flows among developed countries, whereas this share grew to almost 90 per cent in the period 1998-200. International mergers also account for a substantial and growing share among all M&A activities (Chapman, 2008). For an overview of recent trends in cross-border M&A and the relation with falling trade costs, see Hijzen et al. (2008).

[2] Other recent cases that follow a roughly similar pattern include EON/Endesa/GasNatural Arcelor/Mittal, Autostrade/Albertis, Danone/Pepsi, and others. See Sorgard (2007) for a policy-oriented discussion of the national champion debate.

In the decision process of whether to support or reject the firms' merger proposal the government may be subject to a bias against the foreign takeover. There is ample evidence for nationalistic biases in industrial policy (see e.g., Brülhart and Trionfetti, 2001), and more specifically for reservations against acquisitions of domestic firms by foreign corporations. Governments tend to favour domestic ownerships, because the management is then more likely to commit to production in the home country, since politicians find it easier to interact with (and eventually to tax) domestic owners, and so on. A foreign acquisition, in contrast, raises concerns that relationships with local inputs suppliers may not be maintained or that domestic workers are laid off. Apart from these "real" concerns, the aversion against foreign acquisitions may also be due to lobbying effort of well organized domestic interest groups which would be harmed by the takeover and which have good access to the relevant politicians.

In our model we consider a nationalistic bias that endogenously results from a political economy mechanism, similar as in Motta and Ruta (2007). The owners of the domestic firm 1 that would become the outsider in the MNE scenario have an incentive to lobby for a blockade of the foreign acquisition. The subtle reason is that an effective exclusion of the foreign bidder (firm 3) from the takeover auction will leave firm 1 as the only potential buyer. It can then buy the target (firm 2) at a much lower price than without the government blockade, in which case the acquisition price would be determined in an open bidding process between firms 1 and 3 where the target firm 2 reaps most of the takeover gains. We assume below that only this firm 1 has access to the government. Neither the foreign corporation, nor consumers, nor the target firm can engage in lobbying.[3] The strength of the bias against the foreign takeover then depends on how much the government cares about national welfare, relative to lobbying payments (bribes) to be received from the domestic firm 1. A little surprising implication of our model is that the foreign takeover is less likely to emerge in equilibrium the more government cares about bribes, i.e., the stronger it is biased. Our main focus, however, is to analyze how the level of trade costs affects the equilibrium ownership structure.

Our central result is that a process of decreasing trade costs can have a qualitatively different impact depending on the strength of the bias. When the government cares only (or almost only) about welfare we find that globalization triggers the cross-border merger. The foreign takeover would not arise at high levels of trade costs, yet for reasons that are completely unrelated to political economy. Although the takeover is more valuable for the foreign firm if

[3] The foreign firm may have too little informal contacts with, and too little information about domestic government officials. The group of consumers is too diffuse to build an effective lobby group due to the usual collective action problems. Finally, the reason why the owners of the target firm cannot engage in lobbying may be due to their bad reputation in the general public, as they are about to receive large capital gains by selling a national asset abroad. Interacting with these owners does not seem opportunistic to politicians who want to get re-elected.

trade costs are high (since a higher chunk of these costs could be avoided), it is also more harmful for the domestic bidder, which would lose substantial market shares. This anti-competitive effect dominates and allows firm 1 to win the takeover battle at high trade costs (similarly as in Norbäck and Persson 2004, 2005), unless the efficiency advantage of the foreign firm 3 is too strong. When trade integration has gone far enough, however, the foreign firm eventually wins the auction. An unbiased government would not block the takeover attempt, since all negative impacts on national welfare (in particular the loss of domestic operating profits) will be more than compensated by the takeover price that firm 3 pays. Hence, in circumstances where lobbying plays no or little role our model is consistent with the overall empirical trend that cross-border M&A have become more important during trade integration.

Yet, when considering a biased government that cares sufficiently strongly about bribes, we show that globalization reinforces the case for promoting the national champion. The economic rent that a blockade of the foreign takeover generates for the domestic firm 1, and thus the willingness to pay for this blockade, is more substantial at high trade costs. The associated welfare gains of the takeover, which are set into perspective, are instead highest in an intermediate range of trade costs. Hence, the foreign acquisition is allowed precisely in this intermediate range where welfare gains are important enough relative to the luring bribes. Once trade costs have fallen below a critical level, however, government starts to block the takeover and thereby opens the door for the national champion.

In sum, our paper has two major implications for the national champion debate. Firstly, if the government mainly cares about welfare it would not promote national champions. National mergers only arise with such governments when foreign acquisition attempts are fended without the help of politicians. Hence, secondly, national champions are likely to be promoted for political economy reasons, and at a certain stage of trade openness further integration will reinforce this policy option. This result is consistent with the empirical observation that, despite the general trend of an increasing importance of cross-border M&A, at least some governments have recently increased their effort to deter foreign acquisition attempts.

1.1. Related literature

Our paper adds to the literature on foreign direct investment (FDI). The high policy relevance of the debate on national vs. cross-border mergers is not well reflected in that literature, which has strongly focused on greenfield FDI but devoted relatively little attention to M&A. There are, however, a few notable exceptions. Horn and Persson (2001) use a cooperative bargaining game of merger formation in a two-country model with four symmetrical firms. They find that trade integration makes cross-border mergers more likely as compared to the formation of

national mergers. A similar result arises in Norbäck and Persson (2004) where a former state-owned asset is auctioned off between a domestic and a foreign firm. The foreigner can decide to enter the market either by acquiring that asset or by a greenfield investment. If greenfield entry costs are high and M&A is the preferred entry mode, both the foreign and the domestic firm bid more the higher trade costs are. The anti-competitive ("preemptive") motive of the domestic bidder dominates at high trade costs, leading to the national acquisition. Norbäck and Persson (2005) extend this analysis and compare a protectionist policy (allowing only the domestic acquisition) and a national treatment policy that also allows the foreign acquisition. They find that a welfare-maximizing government would not be protectionist, since the acquisition price that the foreigner pays is sufficient to compensate the negative externality for the domestic firm while generating additional positive effects for consumers.

Our model makes similar predictions in the case where the government is unbiased. This leaves open the question, however, why the national champion debate has become so prominent recently while trade costs are on a further declining trend. The main contribution of this paper is to analyze the effect of declining trade costs on the pattern of national vs. cross-border mergers in a model with an endogenous government bias that results from political economy mechanisms.[4] Furthermore, in contrast to Norbäck and Persson (2004, 2005) we do not consider a privatization scenario where the sole motive for the domestic bidder is to prevent foreign market entry. In our setting the target firm is a competitor of the bidders and the domestic merger is endogenously efficient due to synergy effects. This will generate some subtle differences in the outcome of the takeover battle as discussed below.[5]

The impact of lobbying activities on merger policy has recently been studied by Motta and Ruta (2007). They consider a setup with three firms (potentially located in different countries) where two firms are about to merge. Both insiders and outsider engage in lobbying activities and try to push or, respectively, to prevent the merger, provided that competition policy can be influenced by elected politicians and is not carried out by an independent authority. We extend their analysis is two main directions. Firstly, we embed political economy in an explicit takeover auction. The biased government, which is subject to lobbying influences, can crucially affect the strategic position of the bidders as well as the final takeover price. Sec-

[4] Norbäck and Persson (2005) also analyze the effects of "local equity requirements (LERs)", where the government maintains a certain percentage of the state-owned asset after privatization. This makes the acquisition less attractive for the foreigner since it acts like a profit tax. The motive for this LER policy in relation to government preferences is not endogenously derived in Norbäck and Persson (2005), however.

[5] Further recent contributions to the literature on cross-border mergers, yet with a somewhat different focus, include Bjorvatn (2004), Haufler and Nielsen (2008), Lommerud et al. (2006), Neary (2007), Nocke and Yeaple (2007), Norbäck and Perrson (2008, 2007) and Suedekum (2008). More specifically, Huck and Konrad (2004), Horn and Levinsohn (2001) and Head and Ries (1997) focus on the interrelations of merger policy with other policy instruments. A classical reference on mergers in open economies is Barros and Cabral (1994).

ondly, trade costs are assumed away in Motta and Ruta (2007) whereas they play a key role in our model as we are particularly interested in the effect of trade integration.

2) The model

We consider a setup with three firms that produce a homogeneous good. Entry is restricted. Each firm possesses an intangible and non-reproducible asset like managerial skill which is needed to produce at all in that industry. Firms 1 and 2 and their shareholders are located in the domestic country "H". Firm 3 and its shareholders are located in some outside country. Competition takes place on the market in H only, which is populated by a huge mass of consumers. For the domestic firms 1 and 2 unit costs of production are constant and normalized to one. The foreign firm 3 has unit production costs $0 < c \leq 1$. That firm also faces iceberg trade costs for servicing the market: from every unit shipped to country H only a fraction $0 < g < 1$ arrives, where g represents the level of trade openness capturing all sorts of impediments. Effective marginal costs for the foreign firm are, thus, $c/g > 0$. Starting from this initial situation, where all three firms act independently, we consider the following four-stage game that will be solved by backward induction for the sub-game perfect Nash equilibrium:

First stage: The would-be domestic outsider (firm 1) can make contribution payments and the strength of the government's nationalistic bias is determined

Second stage: The shareholders of the firms 1 and 3 bid for the domestic target firm 2 in a takeover auction. The winner submits a merger proposal to the government

Third stage: The domestic government approves or rejects the merger proposal

Fourth stage: Firms compete non-cooperatively à la Cournot in the product market[6]

Firm 2 is the pre-designated acquisition target. In other words, it is "in the air" that the foreign corporation 3 (call it *ENEL*) is only interested in taking over firm 2 (*SUEZ*), but it is not at all interested in buying firm 1 (*GdF*), for reasons such as an incompatibility of corporate cultures. We further focus our attention on two possible ownership structures that can emerge:

1.) The formation of a national champion through a merger of the domestic firms 1 and 2

2.) A takeover of firm 2 by the foreign firm 3

We do not consider the case that one of the domestic firms tries to buy the foreign competitor, and we rule out by assumption that all three firms merge to a monopoly on the domestic market, since this would never be tolerated by the national government. Also we will assume that

[6] All essential results of this paper remain robust under Bertrand competition where firms produce heterogeneous goods, although the notation becomes much more complex. Results on this issue are available upon request.

both types of M&A give rise to sufficiently strong "synergy effects", i.e., reductions in post-merger production costs, so that *some* merger will clearly arise in equilibrium. This assumption, which is clarified formally below, also seems quite realistic: Once a takeover battle is launched, it is often no longer conceivable that no merger takes place and firms just stay independent.[7] In the remainder of this section we derive the market outcomes in the fourth stage of the game for the three possible ownership structures that exist in this model.

2.1. Initial situation without M&A

To obtain closed form solutions we assume that demand in country H is linear and given by

$$p = a - b \cdot H \qquad\qquad a > 2, b > 0 \tag{1}$$

p denotes the price, and $H = x_1 + x_2 + g \cdot x_3$ is the total quantity of the commodity that is consumed. This consists of the domestic production by firms 1 and 2 (x_1, x_2), and the production of the foreign firm net of transport losses ($g \cdot x_3$). The three firms solve the following profit maximization problems by choosing, respectively, their quantities x_1, x_2 and x_3

$$Max\ \pi_i = \left(a - b\left(x_i + x_j + g \cdot x_3\right)\right) \cdot x_i - x_i \qquad\qquad i, j = 1,2;\ i \neq j \tag{2}$$

$$Max\ \pi_3 = \left(a - b\left(x_1 + x_2 + g \cdot x_3\right)\right) \cdot g \cdot x_3 - c \cdot x_3 \tag{3}$$

This is a standard asymmetrical Cournot game that yields the following Nash equilibrium quantities (x_i), price (p) and profits (π_i) that are superscripted with "*pre*" to highlight that they pertain to the situation prior to any type of M&A:

$$x_1^{pre} = x_2^{pre} = \frac{a + c/g - 2}{4b}, \qquad x_3^{pre} = \frac{a - 3c/g + 2}{4bg}, \qquad p^{pre} = \frac{a + c/g + 2}{4} \tag{4}$$

$$\pi_1^{pre} = \pi_2^{pre} = b\left(x_i^{pre}\right)^2 = \frac{\left(a + c/g - 2\right)^2}{16b}, \qquad \pi_3^{pre} = b\left(g x_3^{pre}\right)^2 = \frac{\left(a - 3c/g + 2\right)^2}{16b}$$

We impose parameter restrictions to ensure that the foreign firm is active on the domestic market in the initial situation ($x_3^{pre} > 0$). This requires that the effective marginal costs of the foreign firm c/g are sufficiently low, or in turn that trade costs are sufficiently low: $g > g_{trade} \equiv 3c/(a+2)$. For the welfare evaluation we use the standard concept of total national surplus, which equals the sum of consumer surplus, $CS^{pre} = \left(\left(H^{pre}\right) \cdot \left(a - p^{pre}\right)\right)/2$, and the profits of the two national firms: $\Omega^{pre} = \left(\pi_1^{pre} + \pi_2^{pre}\right) + CS^{pre}$.

[7] The assumption of general synergy effects in production is needed to deal with the well known "merger paradox" that arises in models of Cournot competition. As shown by Salant et al. (1983) mergers are typically not profitable for the participants in the absence of synergies. If synergy effects are sufficiently strong mergers become profitable to insiders and hurt the respective outsider (see, e.g., Motta 2004).

2.2. National champion

If the national champion is formed we have an asymmetric Cournot duopoly in the fourth stage. We denote the single national firm by $\{1+2\}$. Profit maximization problems are now

$$Max\ \pi_{\{1+2\}} = \left(a - b\left(x_{\{1+2\}} + g \cdot x_3\right)\right) \cdot x_{\{1+2\}} - s \cdot x_{\{1+2\}} \tag{5}$$

$$Max\ \pi_3 = \left(a - b\left(x_{\{1+2\}} + g \cdot x_3\right)\right) \cdot g \cdot x_3 - c \cdot x_3 \tag{6}$$

Post-merger unit costs of the national champion are equal to *s*, where $0 < s < 1$ represents the general synergy effects of the merger. The following endogenous variables can be computed for this scenario, superscripted with "*nat*":

$$x_{\{1+2\}}^{nat} = \frac{a + c/g - 2s}{3b} \qquad x_3^{nat} = \frac{a - 2c/g + s}{3bg} \qquad p^{nat} = \frac{a + c/g + s}{3} \tag{7}$$

$$\pi_{\{1+2\}}^{nat} = \frac{\left(a + c/g - 2s\right)^2}{9b} \qquad \pi_3^{nat} = \frac{\left(a - 2c/g + s\right)^2}{9b}$$

Profits $\pi_{\{1+2\}}^{nat}$ are divided among the domestic shareholders. The division rule will play an important role in the takeover battle below, but for the welfare evaluation of this ownership structure only the aggregate national profits matter. Total national surplus is now given by

$$\Omega^{nat} = \pi_{\{1+2\}}^{nat} + CS^{nat} = \frac{\left(a + c/g - 2s\right)^2}{9b} + \frac{\left(2a - c/g - s\right)^2}{18b} \tag{8}$$

Comparing (7) and (4) we can establish some useful preliminary results. The proof and the definition of the threshold levels can be found in appendix A.

Lemma 1: Effects of the national champion

(a) $\pi_{\{1+2\}}^{nat} > \pi_1^{pre} + \pi_2^{pre}$ requires $s < \tilde{s}_\pi$, (b) $CS^{nat} > CS^{pre}$ requires $s < \tilde{s}_{CS}$, where $\tilde{s}_{CS} < \tilde{s}_\pi$.

The national champion is profitable for the participating firms 1 and 2 if the synergy effect is sufficiently strong ($s < \tilde{s}_\pi$), reminiscent of the well known "merger paradox" (Salant et al., 1983). Yet, consumers benefit from it only with a stronger efficiency gain, $s < \tilde{s}_{CS} < \tilde{s}_\pi$, so that prices fall despite the increase in market concentration.[8] It is also instructive to consider the effect of the national merger on the foreign outsider firm. Traditional merger analysis has found that outsiders tend to benefit from mergers under standard Cournot conditions (Farrel

[8] The thresholds for s are lower the lower the production cost advantage of the foreign competitor is, the better the market H is sheltered through trade costs, and the larger market size *a* is. The intuition is that the domestic firms have a stronger position on the market H the higher c is and the lower g is. Farrell and Shapiro (1990) show that horizontal mergers among strong firms are less likely to be profitable than among weak firms.

and Shapiro, 1990). Yet, using (7) and (4), we can compute the following merger externality for the foreign firm:

$$\pi_3^{nat} - \pi_3^{pre} = \frac{1}{144b}\left[16\left(a - 2c/g + s\right)^2 - 9\left(a - 3c/g + 2\right)^2\right] \tag{9}$$

By decomposing (9) it can be shown that the overall sign of this externality depends on the term $\left(a + c/g + 4s - 6\right)$, which is unambiguously negative when $s < \tilde{s}_{CS}$. That is, if the synergy effect is strong enough to imply lower consumer prices (a condition that is assumed to hold below), a negative externality for the foreign outsider firm follows.

2.3. Foreign takeover

The alternative scenario is that firm 3 takes over firm 2 whereas firm 1 stays as an independent competitor. Operating profits of the newly created MNE accrue to the foreign headquarter location and are "lost" for country H. However, a takeover price λ is paid from abroad which is received as a capital gain by the domestic shareholders of the target firm 2.

In the fourth stage of the game this scenario gives rise to an asymmetric Cournot duopoly between the MNE and the domestic outsider firm 1. Trade costs play no role any longer, because the MNE can draw on the existing distribution network and facilities of firm 2. In addition, we assume that the takeover gives rise to synergy effects of identical *absolute* strength in production. That is, post-merger unit costs of the MNE are equal to $0 < c - \left(1 - s\right) < 1$, which implies a parameter restriction $c + s > 1$.[9] The profit maximization problems are now given by

$$Max\ \pi_1 = \left(a - b\left(x_1 + x_{MNE}\right)\right) \cdot x_1 - x_1 \tag{10}$$

$$Max\ \pi_{MNE} = \left(a - b\left(x_1 + x_{MNE}\right)\right) \cdot x_{MNE} - \left(c - \left(1 - s\right)\right) \cdot x_{MNE}, \tag{11}$$

and imply the following solutions that are distinguished by the superscript "*int*":

$$x_1^{int} = \frac{a + c + s - 3}{3b} \qquad x_{MNE}^{int} = \frac{a - 2c - 2s + 3}{3b} \qquad p^{int} = \frac{a + c + s}{3} \tag{12}$$

$$\pi_1^{int} = \frac{\left(a + c + s - 3\right)^2}{9b} \qquad \pi_{MNE}^{int} = \frac{\left(a - 2c - 2s + 3\right)^2}{9b} - \lambda$$

With (12), (7) and (4) we can establish three useful results regarding the foreign takeover in comparison with the pre-merger scenario. These results are proven in appendix B.

[9] Note that this implies stronger cost synergies of the international takeover in *relative* terms if the foreign firm has an initial cost advantage ($c < 1$). The trade cost savings then come in addition to these general synergies. Recently, Bertrand and Zitouna (2008) and Qui and Zhou (2006) have argued that cross-border M&A are in fact likely to yield stronger total synergies than national mergers.

Lemma 2: Effects of the international takeover

If $s \leq \tilde{s}_{CS}$ it follows that: (a) $\pi_{MNE}^{int} + \lambda > \pi_2^{pre} + \pi_3^{pre}$, (b) $p^{int} < p^{pre}$, (c) $\pi_1^{int} < \pi_1^{pre}$

The lemma states that if the synergy effect is strong enough to render the national champion profitable and efficient from the consumer perspective (if $s \leq \tilde{s}_{CS}$), then the international takeover must also be profitable in the sense that gross profits of the MNE (excluding the takeover price) exceed the pre-merger profits of the participating firms 2 and 3. Under the same parameter restriction the takeover also implies lower prices for the domestic consumers. The reason is that trade cost savings arise as an additional effect on top of the general synergies.[10] Finally, the lemma implies that the international takeover induces a negative externality on the (now domestic) outsider firm when the parameter restriction $s \leq \tilde{s}_{CS}$ holds.

We assume from now on that the general synergy effect is, in fact, strong enough to ensure that *both* merger types Pareto-dominate the pre-merger constellation. More specifically, we do not only require that $s \leq \tilde{s}_{CS}$ holds, but for notational convenience we assume that an even stronger general synergy effect $s = \tilde{s}_{CS}\left(g = g_{trade}\right)$ exists:[11]

Assumption 1: $s = \tilde{s}_{CS}\left(g = g_{trade}\right) = \frac{1}{4} \cdot \left(6 - a - \frac{c}{3c/(a+2)}\right) = \frac{4-a}{3}$ (hence, $2 < a \overset{!}{<} 4$)

This assumption implies, economically, that s*ome* merger will surely arise in equilibrium

3) The government approval decision

In this section we analyze the government's decision on the merger proposal in the third stage of the game, where the strength of the bias against the foreign takeover is already determined. I.e., we deal at first with the *consequences* not with *causes* of the government bias.

Welfare in the foreign takeover scenario consists of the domestic consumer surplus (CS^{int}), the profit level of the domestic outsider firm (π_1^{int}), and the takeover price for the target firm (λ) that would be sold abroad: $\Omega^{int} = \pi_1^{int} + CS^{int} + \lambda$. The government then simply deducts some $B \geq 0$ from this proper (unbiased) level of welfare. The term B measures the strength of the nationalistic bias against the foreign takeover, which will be endogenously determined

[10] $s < \tilde{s}_{CS}$ is only a sufficient but not a necessary condition. Gross profits of the MNE may increase compared to the pre-merger scenario even without any direct synergy effects (i.e. even with $s = 1$), purely as a result of trade cost savings. Additional synergy effects reinforce this effect.

[11] Note that $\tilde{s}_{CS}$ is decreasing in g, hence setting $s = \tilde{s}_{CS}(g_{trade})$ requires a stronger synergy effect than the weaker parameter restriction $s \leq \tilde{s}_{CS}$. All results in the remainder of this paper would hold under that weaker restriction, but the notation would become considerably more complicated.

in the first stage of the game that is discussed below.[12] Using (12) and assumption 1, government evaluates the foreign takeover scenario as follows:

$$\Theta^{int} \;=\; \Omega^{\text{int}} - \text{B} \;=\; \frac{(2a+3c-5)^3}{81b} + \frac{(7a-3c-4)^2}{162b} + \lambda - B \tag{13}$$

The role of the government at this stage is to approve or to reject the merger proposal that is submitted by the winner of the takeover auction. If the foreign firm places no sufficient bid and the domestic firm 1 wins the auction, the request for the national merger would always pass since assumption 1 implies $\Omega^{nat} > \Omega^{pre}$. If firm 3 wins the auction and requests the takeover at price λ, government compares Θ^{int} from eq. (13) with the welfare level that arises under the alternative national merger scenario, Ω^{nat}. If $\Theta^{int} - \Omega^{nat} > 0$, the foreign takeover is approved and implemented. If $\Theta^{int} - \Omega^{nat} < 0$ the government rejects the foreign takeover and the national merger is implemented. Using (8), (13) and assumption 1 this decision depends on the differences in consumer surplus (ΔCS) and domestic operating profits ($\Delta\Pi$), and it includes the takeover price λ and the level of bias B:

$$\Delta CS \;\equiv\; CS^{int} - CS^{nat} \;=\; \frac{1}{162b}\left[(7a-3c-4)^2 - (7a-3c/g-4)^2\right] > 0 \tag{14}$$

$$\Delta\Pi \;\equiv\; \pi_1^{int} - \pi_{\{1+2\}}^{nat} \;=\; \frac{1}{81b}\left[(2a+3c-5)^2 - (5a+3c/g-8)^2\right] < 0 \tag{15}$$

$$\Theta^{int} - \Omega^{nat} \;=\; \Delta CS + \Delta\Pi + \lambda - B \tag{16}$$

The foreign takeover is always superior from the point of view of domestic consumers due to the saving of trade costs (see eq. (14)). The difference in domestic operating profits (eq. (15)) is clearly negative, because profits of the acquired target now accrue to the foreign country and the domestic outsider firm suffers a profit loss. Furthermore, one can prove that $\Delta CS + \Delta\Pi < 0$ holds (see appendix C): the consumer gain alone is not sufficient to compensate the loss of operating profits that arises in country H with the foreign takeover. Hence, even if the government were completely unbiased a strictly positive takeover price is needed to compensate for this profit loss, i.e., $\Theta^{int} > \Omega^{nat}$ requires some $\lambda > 0$ even if $\text{B} = 0$.

More generally, since the strength of the bias is already determined at this stage, we can use (16) to explicitly calculate the minimum takeover price for any given level of B that the foreign firm 3 has to pay in order to get government approval:

[12] One possibility to simplify this model is to consider an exogenously determined bias B without specifying its endogenous origin in a political economy framework.

$$\Theta^{int} \geq \Omega^{nat} \quad \Leftrightarrow \quad \lambda \geq \lambda_{min} \equiv -\left(\Delta CS + \Delta\Pi\right) + B \tag{17}$$

$$\rightarrow \quad \lambda_{min} = \frac{1}{162b}\left[\left(7a - \frac{3c}{g} - 4\right)^2 + \left(10a + \frac{6c}{g} - 16\right)^2 - \left(7a - 3c - 4\right)^2 - \left(4a + 6c - 10\right)^2\right] + B$$

This minimum price λ_{min} depends positively on the strength of the bias: The larger B is, the higher is the price that firm 3 needs to pay in order to convince the patriotic government. A constraint of the type $\lambda \geq \lambda_{min}$ is not relevant for firm 1. The government involvement affects the domestic firm indirectly, however, because the bias may effectively exclude firm 3 from the takeover auction when it is not willing to pay as much as λ_{min}.

4. Takeover auction and determination of the takeover price

In the second stage of the game, firms 1 and 3 bid for the pre-designated target firm 2. Our setup is similar to the takeover auction among symmetrical firms that Inderst and Wey (2004) have modelled in a closed economy, but we place it in an open economy context where bidders are asymmetric in terms of unit costs, market access and exposure to government control. Firm 2 is assumed to set some initial reservation price r. The two potential buyers then engage in a simultaneous bidding process, subject to the constraint that firm 3 effectively participates in the auction only if it is willing to place a bid that exceeds $\lambda_{\min}$.[13]

4.1. Government constraint binding

We start with the case where the government constraint is binding. Let $\tilde{\lambda}_3$ denote the maximum price that firm 3 is willing to pay for the target. This maximum price can be derived by comparing net profits of the foreign takeover (π_{MNE}^{int}) with the profit level that firm 3 would earn otherwise under the national champion scenario (π_3^{nat}). Using (12) and (7), $\tilde{\lambda}_3$ is the price λ that solves $\pi_{MNE}^{int} - \pi_3^{nat} = 0$. It is given by

$$\tilde{\lambda}_3 = \frac{1}{81b}\left[\left(5a - 6c + 1\right)^2 - \left(2a - 6c/g + 4\right)^2\right] > 0 \tag{18}$$

The government constraint is binding if $\tilde{\lambda}_3 < \lambda_{\min}$. The consequence of a binding government constraint is that the foreign firm is de facto excluded from the takeover auction and only the domestic firm 1 is left as a potential buyer for the target firm. In this constellation the target firm 2 cannot credibly commit to a take-it-or-leave-it reservation price r that leaves firm 1

[13] Note that our assumption 1 together with lemmas 1 and 2 ensure that (i) the insiders of the merger strictly gain, (ii) the respective outsider strictly loses, and (iii) industry profits strictly increase since the initial pre-merger constellation is inefficient. These properties guarantee that some takeover will clearly occur (see Inderst and Wey 2004, proposition 1.2).

indifferent between acquiring the target in order to build up the national merger or remaining independent. The two domestic firms would rather engage in some negotiation about the actual division rule of the national champion's profit. Without specifying the details of this bargaining process further, we make the following assumption:

Assumption 2: When the constraint $\tilde{\lambda}_3 < \lambda_{\min}$ is binding, the two domestic firms will merge and exactly split the profit level $\pi^{nat}_{\{1+2\}}$, i.e., $\pi^{nat}_1 = \pi^{nat}_2 = \pi^{nat}_{\{1+2\}} \big/ 2$.

Our result do not crucially hinge on this specific 50-50 division rule. It is only required that the target firm will not reap all takeover gains in this scenario, but that that the exclusion of the foreign bidder leaves some takeover rents for the domestic firm 1.[14]

4.2. Government constraint not binding

If the government constraint is not binding, if $\tilde{\lambda}_3 > \lambda_{\min}$ holds, there is a competitive bidding process between firms 1 and 3. The domestic firm's maximum bid (denoted $\tilde{\lambda}_1$) follows implicitly from the division rule of the profit level $\pi^{nat}_{\{1+2\}}$, given that the relevant threat for firm 1 is now the outsider position in the foreign takeover scenario (π^{int}_1). The maximum claim on the national champion's profits that firm 1 is willing to allow for the shareholders of firm 2 is given by $\pi^{nat}_2 = \pi^{nat}_{\{1+2\}} - \pi^{int}_1$, so that the residual claim $\pi^{nat}_1 = \pi^{nat}_{\{1+2\}} - \pi^{nat}_2 = \pi^{int}_1$ just leaves the owners of firm 1 indifferent between the national and the international merger scenario. The maximum bid $\tilde{\lambda}_1$ that follows from (12) and (7) is, thus:

$$\tilde{\lambda}_1 = \pi^{nat}_{\{1+2\}} - \pi^{int}_1 = -\Delta\Pi = \frac{1}{81b}\left[\left(5a + \frac{3c}{g} - 8\right)^2 - \left(2a + 3c - 5\right)^2\right] > 0 \qquad (19)$$

The maximum bid of the foreign firm (which faces the threat of the national merger) is given above in eq. (18). The firm with the higher maximum bid wins the takeover battle. Hence, if $\tilde{\lambda}_1 > \tilde{\lambda}_3$, the national champion is formed and the takeover price that flows between the domestic shareholders is equal to $\lambda = \tilde{\lambda}_3$. Similarly, if $\tilde{\lambda}_3 > \tilde{\lambda}_1$, firm 3 wins the auction and the foreign takeover is implemented. The actual takeover price in this case is $\lambda = \max[\tilde{\lambda}_1, \lambda_{\min}]$, since firm 3 might have to pay more than $\tilde{\lambda}_1$ if that price is not sufficient to pass the government stage (if $\tilde{\lambda}_1 < \lambda_{\min} < \tilde{\lambda}_3$).

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[14] The specific 50-50 division rule would result if the two firms negotiate about the profit sharing rule of the national champion in a Nash-bargaining, where the threat point is the pre-merger profit. I.e. the particular division rule in assumption 2 appears to be quite natural taking into account that the two firms are ex-ante identical.

4.3. Equilibrium ownership structure for given bias B

Figure 1 illustrates the equilibrium ownership structure for different strengths of the government bias. We choose numerical values for a, b and c, and we depict $\tilde{\lambda}_1$, $\tilde{\lambda}_3$ and $\lambda_{\min}$ over the feasible range of g for different values of B. In appendix D we show analytically that the results that we discuss for this particular example hold more generally.

In **panel (a)** we assume a strong bias so that $\lambda_{\min}$ runs above $\tilde{\lambda}_3$ over the whole range of trade openness g. The foreign takeover can never be implemented in this constellation, because it is ruled out a priori by the biased domestic government. Hence, the national champion will always be implemented. As the domestic firm is the only serious bidder in this constellation, assumption 2 applies and the price for the target will be equal to $\lambda = \pi^{nat}_{\{1+2\}} / 2$. That price is indicated by the grey dotted line, which is considerably lower than firm 1's maximum willingness to pay if the foreign takeover were a real threat ($\tilde{\lambda}_1 > \pi^{nat}_{\{1+2\}} / 2$).

Panel (b) illustrates the opposite case where the government is completely unbiased (B=0). The government constraint is never binding as $\lambda_{\min}$ always runs below $\tilde{\lambda}_3$. All three curves are downward sloping in g. The takeover is more profitable for the foreign firm the lower the initial trade openness g is, because a larger chunk of trade costs could be avoided through the acquisition. Due to this "tariff-jumping motive" firm 3 is, thus, willing to place a higher maximum bid $\tilde{\lambda}_3$ the lower g is. At the same time the domestic firm 1 has a stronger incentive to prevent the foreign takeover. The reason is that the negative externality is more severe the better firm 1 is initially sheltered through the trade cost barrier. Hence, firm 1 is willing to place a higher bid $\tilde{\lambda}_1$ the lower g is in order to prevent the foreign takeover. Finally, the minimum price required by the government ($\lambda_{\min}$) runs below, but converges to $\tilde{\lambda}_1$ as g increases, until the two curves collapse at $g = 1$. The reason is that the government trades off the consumer gain of the foreign takeover ($\Delta CS > 0$) against the domestic profit loss ($\Delta \Pi < 0$). At $g = 1$ the two merger types are equivalent from a consumer perspective ($\Delta CS = 0$) since there are no trade costs to be avoided, but firm 1 would still suffer a profit loss due to the merger synergies. This explains why $\tilde{\lambda}_1$ and $\lambda_{\min}$ must coincide at $g = 1$. The consumer gain moderates the profit loss for $g < 1$, hence $\lambda_{\min}$ is flatter in g than $\tilde{\lambda}_1$.

Figure 1(b) suggests that the foreign takeover emerges at low levels of trade costs. To the right of point Z the foreign firm outbids the domestic competitor, and the foreign takeover will be implemented at the price $\lambda = \tilde{\lambda}_1$. To grasp the intuition for this result, consider the case with perfect trade openness ($g = 1$). Firm 3 will outbid firm 1, because it has an initial

productivity advantage over the domestic rival ($c<1$) which effectively translates into a higher bidding power of the foreign firm. The government requires that the domestic profit loss $\Delta\Omega=\Delta\Pi<0$ is compensated with a price $\lambda=\lambda_{\min}=\tilde{\lambda}_1$. Firm 3 is willing to pay this price while still realizing a strictly positive takeover rent ($\tilde{\lambda}_3-\tilde{\lambda}_1>0$ at $g=1$). Moving to the left on the $g-$axis, both maximum bids $\tilde{\lambda}_1$ and $\tilde{\lambda}_3$ increase but $\tilde{\lambda}_1$ rises steeper than $\tilde{\lambda}_3$. In other words, the tariff-jumping motive for firm 3 is less important at the margin than the anti-competitive motive for firm 1 that tries to prevent becoming the outsider of the MNE scenario. For high enough levels of g the domestic firm still loses the takeover battle, because the higher bidding power of the foreign firm dominates. Yet, the foreign firm's initial advantage due to $c<1$ is exhausted if g is low enough (to the left of point Z), because lower levels of g raise effective marginal costs for the foreign firm and lower its bidding power.

In appendix D.1 and D.2 we provide further analytical details. We compute the trade cost level $\tilde{g}$ where the curves $\tilde{\lambda}_1$ and $\tilde{\lambda}_3$ cross, and we discuss the comparative statics. Furthermore, we show that the foreign firm can never win the auction if it has no productivity advantage (if $c=1$). Similarly, the MNE would always result if c is low enough, because the domestic firm can then never compete with the bidding power of the foreign rival. To sum up:

<u>Result 1</u>: Suppose the government is unbiased (B=0). If the difference in unit costs between firms 1 and 3 is not too large, the foreign takeover emerges at low levels of trade costs and the national champion emerges at high levels of trade costs. If c=1 the national merger is implemented over the whole range of trade costs. If c is sufficiently low, the foreign takeover occurs over the entire feasible range of trade costs.

Qualitatively, result 1 implies that "globalization" ($g\uparrow$) triggers the foreign takeover. This is in line with the aforementioned empirical observation that cross-border mergers have become more important during the ongoing trend of falling trade barriers. The result is also similar to a previous finding by Norbäck and Persson (2004), yet with the important difference that in our model the foreign firm can only win the auction at low trade costs if it has some initial productivity advantage ($c<1$).[15]

[15] Norbäck and Persson (2004) assume that unit costs of production are the same for the domestic and the foreign firm. Furthermore there are no general merger synergies unrelated to trade costs. In their model, focussing on the case with high greenfield costs to which our setup corresponds, the foreign bidder wins the auction when trade costs are low. In our model this is not true if c=1. The reason for this difference is that the domestic firm has not only a "preemptive", but also an efficiency-seeking motive. If foreign market entry were completely ruled the domestic firm still has an incentive to buy the target in our model, but not in Norbäck and Persson (2004).

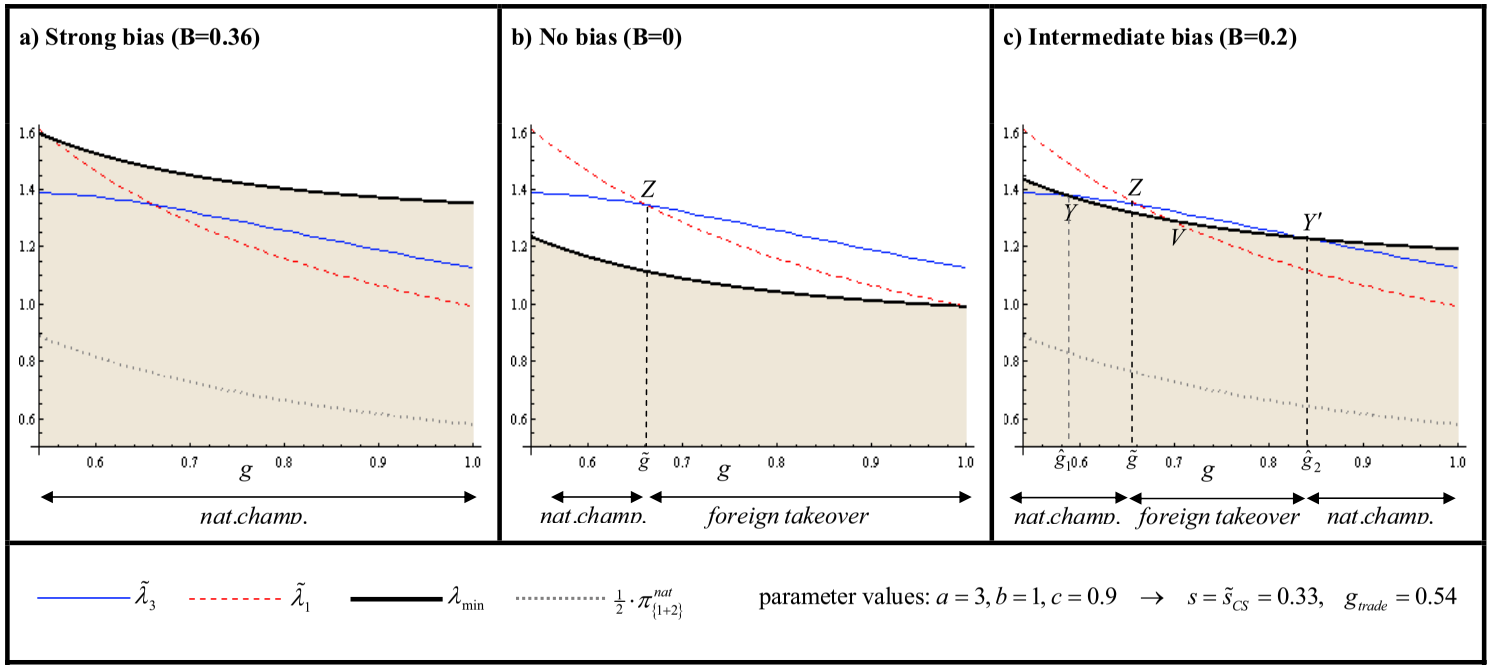


Figure 1

Globalization (g↑) and the equilibrium ownership structure for different bias strengths

Furthermore, the result that trade integration clearly triggers cross-border M&A only holds in the case with an unbiased government, whereas different results emerge in our model when a bias exists. Consider **panel (c)** of figure 1 where we assume a bias B of medium strength. The government constraint $\tilde{\lambda}_3 < \lambda_{\min}$ is binding for low levels of trade openness (up to point Y), so that firm 1 would buy firm 2 at the low price $\lambda = \pi^{nat}_{\{1+2\}} \big/ 2$ (the grey dotted line). In an intermediate range of g between Y and Y' the government constraint is not binding. In the lower part of that range (between Y and Z) the national champion would still emerge, since firm 1 outbids firm 3. Yet, the domestic firm now has to pay the much higher price $\lambda = \tilde{\lambda}_3$, i.e., the actual takeover price exhibits an upward jump at the point Y, because firm 3 enters the scene as a serious bidder. In the range between Z and Y' the foreign corporation would win the takeover battle and the MNE is formed. The actual takeover price differs within this range. In the range between Z and V it is given by $\lambda = \tilde{\lambda}_1$, because that price is sufficient to get the government support (since $\tilde{\lambda}_1 > \lambda_{\min}$). In the range between V and Y' the foreign firm has to pay $\lambda = \lambda_{\min} > \tilde{\lambda}_1$ to pass the government stage. Finally, if trade openness is sufficiently high (beyond the point Y') the equilibrium ownership structure is again the national champion. Even though the foreign firm would, in principle, outbid the domestic rival the constraint $\tilde{\lambda}_3 < \lambda_{\min}$ becomes binding and the takeover is blocked. The acquisition price will now exhibit a downward jump at Y' to the grey dotted line, because from that point onwards the domestic firm is again the only potential buyer.

An increase in the strength of the bias B would shift up the curve $\lambda_{\min}$ and decrease the range of g in which the foreign takeover can arise, until the MNE is completely ruled out (as in panel a). This result is little surprising: the MNE is less likely to emerge as the equilibrium ownership structure the stronger the bias against foreign takeovers is. Yet, the more interesting question is how trade integration (g↑) affects the equilibrium for a given strength of B.

Figure 1(c) suggests that the national champion arises for low and for high levels of g. The reason for its emergence in these two ranges is entirely different, however. If trade costs are high, the national champion is formed because the domestic firm 1 outbids the foreign rival. This would happen irrespective of the government involvement.[16] If trade costs are low, the occurrence of the national champion is entirely driven by the government bias. With $B > 0$ it becomes necessary to pay a higher takeover price in order to pass the government stage, and if this "tax" on the takeover rent is large enough firm 3 will eventually no longer place a bid.

[16] To the left of point Y government involvement affects only the takeover price but not the ownership structure.

To understand why the foreign takeover goes through only for intermediate trade costs (between Z and Y') one must distinguish two aspects:

1. In the range between Z and Y' trade openness g is sufficiently high given the initial unit cost advantage ($c<1$) so that the foreign firm's bidding power still prevails over the domestic firm's attempt to prevent the takeover.
2. At the same time, trade costs savings are sufficiently high in that range, so that the foreign takeover implies a consumer gain ΔCS that is substantial enough to effectively warrant government approval.

Result 2 summarizes these insights:

<u>Result 2</u>: Suppose the government is biased against the foreign takeover (B>0), but this bias is not so strong to generally rule out this merger type. In that case the foreign takeover will arise for intermediate levels of trade costs only. For low and for high levels of trade costs the national champion will be implemented.

Some further details about result 2 are presented in appendix D.3 where we derive the analytical expressions for the points Y and Y' and discuss the comparative statics. Economically this result implies that if trade openness is already high ($g \approx \hat{g}_2$), further integration reinforces the policy option to block the foreign takeover and to promote the national champion.

5.) Optimal choice and endogenous origin of the government bias

In this last step of the analysis we will discuss how government behaves when it endogenously decides on the level of its bias B in the first stage of the game, and we will show how this bias can originate in lobbying efforts by the domestic firm 1.

5.1. Endogenous choice of the bias B

The strength of the bias B will determine government behaviour during the approval decision in the third stage. Government always has the option to set B (and therefore $\lambda_{\min}$) high enough to repel the foreign firm from the auction. This blockade would lead to the formation of the national merger, hence the welfare level Ω^{nat}. The alternative is to choose B low enough to leave the foreign firm in the race for the domestic target. This trade-off for the government is only relevant in those constellations where the foreign firm would, in principle,

win the auction for the target (where $\tilde{\lambda}_3 > \tilde{\lambda}_1$). We will therefore restrict our attention to trade openness levels $\tilde{g} < g < 1$ (see appendix D).

Even if government decides not to block the foreign takeover in that range, it would still demand a takeover price $\lambda_{\min} = \tilde{\lambda}_3$ that "taxes away" all takeover rents from the foreign firm and that just leaves it indifferent between buying and not buying the target. Put differently, an optimizing government in our model would never be completely unbiased and leave a rent $\left(\tilde{\lambda}_3 - \tilde{\lambda}_1\right) > 0$ to the foreigner, but it would always squeeze out this rent by setting a sufficiently high level of B and, thus, $\lambda_{\min}$. In sum, government that strictly maximizes national welfare has to choose from the following two options:

$$\underset{\{B\}}{Max}\left[\Omega^{nat}, \Omega^{\text{int}}*\right] \qquad \text{where } \Omega^{\text{int}}* = CS^{\text{int}} + \pi_1^{\text{int}} + \tilde{\lambda}_3 \tag{20}$$

We can provide the following result that is proven formally in appendix E.1:

<u>Result 3:</u> Suppose the foreign bidder has a higher maximum valuation for the target than the domestic bidder ($\tilde{\lambda}_3 > \tilde{\lambda}_1$). A strictly welfare maximizing government would never choose a bias level that blocks the foreign takeover, but a level of B such that the takeover is allowed and all takeover rents are taxed away from the foreign firm.

The intuition for this result is clear cut: Even the price $\tilde{\lambda}_1 = -\Delta\Pi$ suffices to compensate the loss in domestic operating profits. In addition there are consumer gains associated with the foreign takeover ($\Delta CS > 0$). Hence, the takeover at the higher price $\lambda_{\min} = \tilde{\lambda}_3 > \tilde{\lambda}_1$ must be strictly welfare-improving for the domestic country compared to the national champion formation ($\Delta\Omega* \equiv \Omega^{\text{int}}* - \Omega^{nat} > 0$). Result 3 is important as it highlights that a national champion policy is not likely to be pursued out of strictly welfare-oriented motives.

In fact, without the blockade firm 1 would earn π_1^{int} and the shareholders of firm 2 receive a capital gain $\tilde{\lambda}_3 > \tilde{\lambda}_1 = \pi_{\{1+2\}}^{nat} - \pi_1^{int}$. Overall domestic producer surplus without the blockade is, thus, $\pi_{\{1+2\}}^{nat} + \left(\tilde{\lambda}_3 - \tilde{\lambda}_1\right)$. A blockade reduces total domestic producer surplus to only $\pi_{\{1+2\}}^{nat}$, and domestic consumer surplus would also be lower by the amount ΔCS. An important thing to note, however, is that the blockade of the foreign takeover also has important distributional consequences by affecting the target's ability to reap takeover gains (see assumption 2). With the blockade the owners of firm 1 would now earn more ($\pi_1^{nat} = \pi_{\{1+2\}}^{nat} / 2 > \pi_1^{int}$), whereas the owners of firm 2 now earn less ($\pi_2^{nat} = \pi_{\{1+2\}}^{nat} / 2 < \tilde{\lambda}_3$). This shift in the distribution of domestic profits is, per se, irrelevant for utilitarian national welfare. Yet, it is clear that the government

blockade of the foreign takeover generates an economic rent equal to $\pi^{nat}_{\{1+2\}}/2 - \pi^{int}_1 > 0$ for firm 1, so that it has an incentive to lobby for the blockade policy. We now finally turn to our political economy framework to analyze this lobbying process.

5.2. The political economy framework and the endogenous origin of the bias

Our political economy framework is similar to Motta and Ruta (2007), yet with a few important differences. Firstly, we add the lobbying game on top of an explicit takeover auction. Secondly, trade costs play a crucial role for our analysis, and finally, we assume that only firm 1 can influence the government by paying bribes. The other involved parties cannot engage in lobbying, as they do not have access to the domestic politicians (the foreign firm), lack a coherent organization to overcome internal free-rider problems (domestic consumers) or are stigmatized due to the attempt of selling a national asset abroad (target firm).[17]

We can think of the lobbying process as follows: In the first step firm 1 commits on an amount ℓ_1 to be paid to the government if it blocks the foreign takeover, which would be implemented otherwise since we focus on cases where $\tilde{\lambda}_3 > \tilde{\lambda}_1$. In the second step, the government sets these payments ℓ_1 into perspective to the welfare gain from allowing the foreign takeover ($\Delta\Omega^* > 0$, see appendix E.1). Given its preferences the government will then optimally choose B and the game proceeds as described above. The bribes are paid in the third stage where the government effectively declares its decision on the merger case. We assume that firm 1's commitment on ℓ_1 is truthful and will not be re-negotiated.

Government essentially chooses its policy from a binary set $z = \{0,1\}$, where $z = 1$ indicates the decision to set B such that the foreign takeover is just implemented, but all rents are taxed away from firm 3 ($\lambda_{\min} = \tilde{\lambda}_3 > \tilde{\lambda}_1$). That option is associated with the welfare level Ω^{int}* and it implies that no bribes from firm 1 will be paid. The other option, indexed with $z = 0$, is to choose a higher level of B, in which case we would have $\lambda_{\min} > \tilde{\lambda}_3 > \tilde{\lambda}_1$, welfare Ω^{nat} and bribe payment ℓ_1 from firm 1. The government objective function Θ is assumed to be a weighted sum of the welfare gain from allowing the takeover and the bribe payments:

$$\Theta = \eta \cdot \left[\Omega^{nat} + z \cdot \Delta\Omega^*\right] + (1-\eta)\cdot(1-z)\cdot \ell_1 \qquad \text{with } 0 \le \eta \le 1, \quad z = \{0,1\}. \qquad (21)$$

The parameter η measures the government's benevolence, i.e., the weight attached to welfare.

[17] In Motta and Ruta (2007) both insiders and outsiders of a potential merger can engage in lobbying. Our results remain robust when the target firm 2 is also allowed to engage in lobbying, provided that firm 1 is sufficiently more efficient in its lobbying technology.

Turning to the first step, the lobbying decision, a government blockade of the foreign takeover (policy $z=0$) would imply the following economic rent for the domestic firm 1 in a situation in which the foreign firm would otherwise win the auction,

$$\mu_1^{nat} \equiv \tfrac{1}{2}\cdot\pi_{\{1+2\}}^{nat} - \pi_1^{int} = \tfrac{1}{162b}\left[\left(5a+\tfrac{3c}{g}-8\right)^2 - 2\left(2a+3c-5\right)^2\right] > 0. \qquad (22)$$

The maximum contribution that firm 1 is willing to pay for policy $z=0$ is, thus, given by $\ell_1 = \mu_1^{nat} - k_1$, where k_1 can be understood as a net of contribution benefit that will be optimally adjusted by firm 1 if a payment $\ell_1 < \mu_1^{nat}$ suffices to induce $z=0$. Using (21) and (22) the final policy can be inferred from the following variable $\Delta\Theta$ that describes the difference in the government objective function with $z=1$ and $z=0$, respectively:

$$\Delta\Theta \equiv \Theta(z=1) - \Theta(z=0) = \eta\cdot\Delta\Omega^* - (1-\eta)\cdot\left(\mu_1^{nat} - k_1\right) \qquad (23)$$

When $\Delta\Theta > 0$ government chooses $z=1$, whereas $\Delta\Theta < 0$ implies the blockade ($z=0$).

Figure 2 illustrates this decision process. In the left panel (fig. 2a) we depict $\Delta\Theta$ over the range $\tilde{g} < g < 1$ for different values of η, where we have set $k_1 = 0$ for simplicity. When the weight attached to welfare is low government generally promotes the national champion. This can be seen in the example with $\eta = 0.65$ (the broken line). Over the whole range of g we have $\Delta\Theta < 0$ and, thus, $z=0$. Conversely, if η is sufficiently large government would always choose policy $z=1$, as for example in the case with the thin solid line where $\eta = 0.77$. The example with the thick solid line shows that for the level of $\eta = 0.71$ the foreign takeover is only allowed in an intermediate range of trade costs, whereas it is blocked for low and for high values of g. The dotted line ($\eta = 0.735$) depicts a similar case where $z=1$ is chosen for low and $z=0$ for high values of g within in the range $\tilde{g} < g < 1$. The difference between the two latter cases is that government still rejects the foreign takeover when it is first requested (around $g = \tilde{g}$) in the first, but not in the second one. Both cases have in common that the national champion policy $z=0$ is pursued once trade costs are low enough.

The intuition behind these results can be illustrated as in fig. 2b on the right. The thick solid line is the proper net welfare gain from allowing the foreign takeover, $\Delta\Omega^* > 0$, which is composed of the consumer gain $\Delta CS > 0$ (the downward-sloping broken line) and the producer surplus difference $\Delta\Pi + \tilde{\lambda}_3 = \left(\tilde{\lambda}_3 - \tilde{\lambda}_1\right) > 0$ (the upward-sloping broken line). This overall welfare gain $\Delta\Omega^*$ is hump-shaped in g, as shown formally in appendix E.1. At low trade costs the welfare gain is relatively small because relatively few trade costs could be avoided

through the foreign takeover, hence, the implied consumer gain would be small. At high trade costs the consumer gain is more substantial, but the gain in producer surplus is now lower. The reason is that at $g = \tilde{g}$ we have $\tilde{\lambda}_3 = \tilde{\lambda}_1$, i.e., at this point the takeover price just offsets the loss in domestic operating profits $\Delta\Pi < 0$ but there are no additional capital gains resulting from the fact that the government adjusts $\lambda_{\min}$ so as to charge $\tilde{\lambda}_3$ from firm 3.

Fig. 2a) Final policy choice

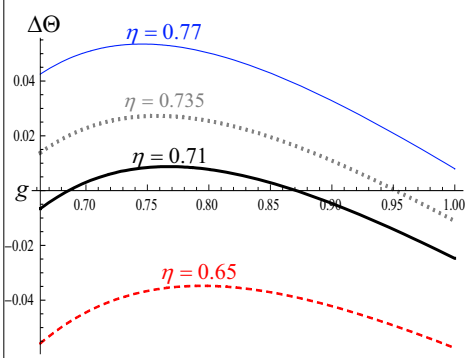
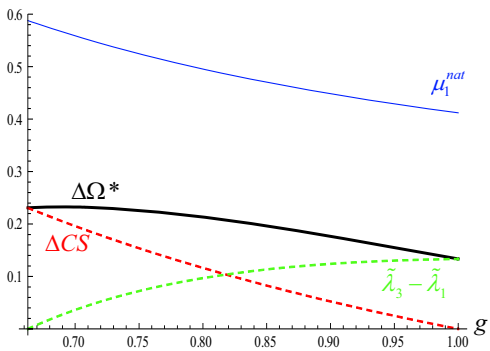


Fig. 2b) Welfare gain vs. lobbying payments



parameter values: $a = 3, b = 1, c = 0.9 \rightarrow \tilde{g} = 0.662$

In fig.2b we also depict the economic rent μ_1^{nat} that firm 1 would obtain from a blockade of the foreign takeover, see the thin solid line. Two things should be noted. Firstly, the curve μ_1^{nat} is strictly decreasing in g. At high trade costs the foreign takeover would be more harmful for firm 1 as it would lose more substantial market shares. Hence, a blockade generates higher rents and, thus, firm 1 is willing to pay higher bribes at low levels of g. Secondly, the potential lobbying payment is always higher than the net welfare gain, i.e., $\mu_1^{nat} > \Delta\Omega^*$ generally holds in the range $\tilde{g} < g < 1$ (see appendix E.2 for the formal proof). The intuition is as follows: Firm 1's willingness to pay for the blockade policy $z = 0$ is determined by the *total* size of the loss that it would suffer if the foreign takeover is implemented. The welfare gain $\Delta\Omega^* = \Delta CS + \left(\tilde{\lambda}_3 - \tilde{\lambda}_1\right)$ is, on the other hand, a *net* calculation that aggregates up the consumer and the capital gain for the owners of the target firm and the profit loss for firm 1. Even though the total gains for the winning parties (consumers and firm 2) would outweigh the to-

tal loss for firm 1, only that firm can engage in lobbying, and its total loss turns out to be more substantial than the net gain for the domestic country as a whole.[18]

Since $\mu_1^{nat} > \Delta\Omega^*$ holds, it is clear that the government would always choose the national champion policy $z = 0$ if it cares equally or more about bribes than about welfare (if $0 \le \eta \le 1/2$), see eq. (23). In the range $1/2 < \eta \le 1$ it can be shown that $\Delta\Theta$ is also hump-shaped in g and that there exist at most two levels in the relevant range $\tilde{g} < g < 1$ where $\Delta\Theta = 0$ (see appendix E.2). The thin solid and the broken line in fig.2a are cases where crossing point of $\Delta\Theta$ with the horizontal axis exists, i.e., where the choice of z does not change in the range of g. The dotted line illustrates a case with one, and the thick solid line depicts a case with two crossing points. In both cases the foreign takeover request is blocked and the national champion is pushed when trade costs have become sufficiently small.

Summing up, this section has shown how the government bias against the foreign takeover can endogenously originate in a political economy framework. A government that is strongly biased and that always rejects the takeover is, more precisely, a government that cares little about welfare but a lot about bribes from the would-be outsider firm 1. Conversely, a government that has been called "unbiased" before is one that is mostly welfare oriented and that cares sufficiently little about bribes.

6) Conclusion

In this paper we have studied an oligopoly model with two domestic and one foreign firm, where either a national merger is formed or one of the domestic firms is taken over by the foreign corporation. The domestic government has to approve any type of M&A. Our main focus has been the analysis which merger type arises as the equilibrium ownership structure for different levels of trade costs, and for different strengths of the government bias against the foreign takeover, which endogenously results from lobbying efforts by the domestic would-be outsider firm.

When the government is unbiased, i.e., if it cares only or almost only about welfare and not about bribes, it would not consider blocking the foreign takeover when it is requested by the firms. Promoting national champions is not an option for such a government. The national

[18] This result depends crucially on the division rule specified in assumption 2. When the blockade generates a less favourable profit sharing rule and therefore a lower rent for firm 1, it may not generally be the case that $\mu_1^{nat} > \Delta\Omega^*$ holds for all levels $\tilde{g} < g < 1$. Yet, also for such cases it would be true that government chooses the national champion formation when η is sufficiently small.

merger can still occur if trade costs are high, but due to the fact that the domestic firm outbids the foreign rival without the help of the government. When the government is strongly biased, meaning that it is predominantly interested in receiving bribes, it would always aim at the national champion formation in our model.

Finally, the most interesting case is probably the one with an intermediate bias resulting from a balanced government interest in welfare and lobbying payments. At high trade costs the national merger arises as the domestic firm outbids the foreign one. At intermediate levels government allows the MNE formation while taxing away all takeover rents from the foreign firm. Yet, when trade costs are already sufficiently low, further trade integration reinforces the case for promoting the national champion. Below a certain threshold level government starts to block the takeover in order to promote the national champion.

Our model leads to several, potentially testable theoretical hypotheses. Firstly, in countries with a welfare-oriented merger policy we should observe that falling trade barriers (globalization) trigger more cross-border mergers and acquisitions of domestic firms by foreign corporations. Of course it is difficult to precisely measure government objectives. Yet, one possibile way of measuring that follows from our model as well as from Motta and Ruta (2007) is to characterize competition policy as welfare-oriented when it is carried out by independent authorities whose decisions on merger cases cannot be influenced or overturned by politicians who directly strive for re-election. This positive impact of economic integration on cross-border merger activity should be observable at all current levels of trade costs, as our model suggests that there is no threshold level of trade costs where the adopted merger policy changes when no government bias exists. Secondly, in countries where elected politicians have a sufficiently strong influence on merger policy we should observe that globalization also triggers cross-border mergers if the level of trade costs is still high. At a later stage of economic integration, however, we should observe an increase in government activity to block foreign acquisition attempts in these countries.

Although there is clearly scope for more thorough empirical research, a casual look at recent empirical developments suggests that our model yields quite consistent predictions. On average there has been a surge of cross-border mergers over the last decades (Hijzen et al. 2008; Chapman 2008), which is consistent with our model when the impact of political economy mechanisms is not too strong. Yet, this average trend notwithstanding, one can also observe that globalization has recently put the idea of promoting national champions high on the policy agenda at least in some countries, when it comes to foreign takeover attempts of large and prominent domestic companies. In these countries (e.g., in France, Spain or Germany) compe-

tition authorities are in fact not completely independent, but elected politicians play an important role in and, thus, political economy matters for antitrust and merger decisions. Furthermore, all of these countries are well integrated into the world economy, and exposed to further economic integration like, for example, EU integration.

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Appendix

Appendix A: Proof of lemma 1

part (a): Using (4) and (7) we can compute the following difference terms:

$$\pi_{\{1+2\}}^{nat} - \pi_1^{pre} - \pi_2^{pre} = \frac{1}{72b}\left[8\left(a + c/g - 2s\right)^2 - 9\left(a + c/g - 2\right)^2\right] \quad \text{(A1)}$$

$$CS^{nat} - CS^{pre} = \frac{a + c/g + 4s - 6}{12} \quad \text{(A2)}$$

Setting (A1) equal to zero and solving for s we obtain two solutions, one of which always falls out of the relevant range $0 < s < 1$ under the parameter restrictions $a > 2$, $0 < c \leq 1$ and $g_{trade} < g \leq 1$ where $g_{trade} = 3c/(a+2)$. In (A3) we report the solution for $\tilde{s}_\pi$ that falls into the relevant range, and where $\pi_{\{1+2\}}^{nat} > \pi_1^{pre} - \pi_2^{pre}$ if $0 < s < \tilde{s}_\pi$ and $\pi_{\{1+2\}}^{nat} < \pi_1^{pre} - \pi_2^{pre}$ otherwise:

$$\tilde{s}_\pi = \frac{4\left(a + c/g\right) - 3\sqrt{2}\left(a + c/g - 2\right)}{8} \quad \text{(A3)}$$

part (b): Setting (A2) equal to zero and solving for s yields a unique solution, labelled $\tilde{s}_{CS}$:

$$\tilde{s}_{CS} = \tfrac{1}{4} \cdot \left(6 - a - c/g\right) \quad \text{(A4)}$$

where $\tilde{s}_{CS} < \tilde{s}_\pi < 1$ always holds under the imposed parameter restrictions. The additional restriction $a < \overline{a} \equiv 6 - c/g$ ensures $\tilde{s}_{CS} > 0$, and thus $0 < \tilde{s}_{CS} < \tilde{s}_\pi < 1$. Note that $\tilde{s}_{CS}$ is increasing in g, hence lower trade openness requires a stronger threshold synergy effect. □

Appendix B: Proof of lemma 2

part (a): Let $\pi_3^{int} \equiv \pi_{MNE}^{int} + \lambda$ denote the gross profits of the MNE before paying the takeover price λ. Using (4) and (12) we compute the following gross profit difference for the MNE

$$\pi_3^{int} - \pi_2^{pre} - \pi_3^{pre} = \tfrac{1}{144b}\left[16\left(a-2c-2s+3\right)^2 - 9\left(\left(a-3c/g+2\right)^2 + \left(a+c/g-2\right)^2\right)\right] \qquad \text{(B1)}$$

It readily follows that this gross profit difference is larger the stronger the synergy effect is (the lower s is). At $s = \tilde{s}_\pi$ (see A3) the first term in the squared parentheses in (B1) becomes

$$\left(3\left(a\sqrt{2}+4-2\sqrt{2}\right) + \tfrac{c}{g}\cdot\left(3\sqrt{2}-4-8g\right)\right)^2 > 0$$

which is always larger than the negative second term in squared parentheses in (B1). Hence $\pi_3^{int} > \pi_2^{pre} + \pi_3^{pre}$ when $s < \tilde{s}_\pi$ and, thus, when $s < \tilde{s}_{CS}$ since $0 < \tilde{s}_{CS} < \tilde{s}_\pi < 1$.

part (b): The consumer price difference is $p^{int} - p^{pre} = \tfrac{1}{12}\left[\left(a+4s-6\right) + \tfrac{c}{g}\cdot\left(4g-3\right)\right]$. Note that $\partial\left(p^{int}-p^{pre}\right)\big/\partial s > 0$. At $s = \tilde{s}_{CS}$ we have $p^{int} - p^{pre} = -\left(c\left(1-g\right)/3g\right) < 0$, hence $p^{int} < p^{pre}$ whenever $s < \tilde{s}_{CS}$ since $(p^{int} - p^{pre})$ is continuous is s.

part (c): Consider the externality of the foreign takeover on the domestic outsider firm

$$\pi_1^{int} - \pi_1^{pre} = \tfrac{1}{144b}\left[16\left(a+c+s-3\right)^2 - 9\left(a+c/g-2\right)^2\right] \qquad \text{(B2)}$$

It is readily verified that $\partial\left(\pi_1^{int} - \pi_1^{pre}\right)\big/\partial s > 0$. Furthermore, at $s = \tilde{s}_{CS}$, eq. (B2) becomes

$$\pi_1^{int} - \pi_1^{pre} = -\tfrac{1}{18b}\left[\tfrac{c}{g}\cdot\left(1-g\right)\left(3a+2c+c/g-6\right)\right] < 0 \qquad \text{since } a > 2$$

Hence, if $s < \tilde{s}_{CS}$, then $\pi_1^{int} < \pi_1^{pre}$ since (B2) is also continuous in s. □

Appendix C: Proof that $\left(\Delta CS + \Delta\Pi\right) < 0$

Using (14), (15) and assumption 1, the term $\Delta CS + \Delta\Pi$ at maximum trade openness $g = 1$ becomes

$$\left(\Delta CS + \Delta\Pi\right) = -\tfrac{1}{27b}\left[\left(a-1\right)\left(7a+6c-13\right)\right] < 0,$$

which must be negative since $a > 2$ and $0 < c < 1$. At minimum openness $g = g_{trade}$ we have

$$\left(\Delta CS + \Delta\Pi\right) = \tfrac{1}{54b}\left[\left(40a-17a^2\right) + \left(9c^2-14\right) - 6\left(a+2\right)\right] < 0$$

This term must also be negative since all the three terms within the squared parentheses are negative with $a > 2$ and $0 < c < 1$. Finally, the term $\left(\Delta CS + \Delta\Pi\right)$ has an extremum at $g = 3c/a - 4$ since $\partial\left(\Delta CS + \Delta\Pi\right)\big/\partial g = c\left(3c + g\left(a-4\right)\right)/9bg^3$. At this extremum we $\left(\Delta CS + \Delta\Pi\right) = \left[(64a - 17a^2) + (9c^2 - 74) - 6(a+2)\right]/54b < 0$, which is also negative. Hence, $\Delta CS + \Delta\Pi$ must be negative over the whole range of g. □

Appendix D: Equilibrium ownership structure

In this appendix we show that the qualitative results of figure 1 hold more generally. For this proof we use the analytical expressions for the maximum bids of firms 1 and 3, and the minimum required price from the government. These are given by (see eqs. (17), (18) and (19)):

$$\tilde{\lambda}_1 = \tfrac{1}{81b}\left[\left(5a+\tfrac{3c}{g}-8\right)^2-\left(2a+3c-5\right)^2\right] \tag{D1}$$

$$\tilde{\lambda}_3 = \tfrac{1}{81b}\left[\left(5a-6c+1\right)^2-\left(2a-6c/g+4\right)^2\right] > 0 \tag{D2}$$

$$\lambda_{min} = \tfrac{1}{162b}\left[\left(7a-\tfrac{3c}{g}-4\right)^2+\left(10a+\tfrac{6c}{g}-16\right)^2-\left(7a-3c-4\right)^2-\left(4a+6c-10\right)^2\right]+B \tag{D3}$$

D.1. Minimum and maximum trade costs: Evaluating the terms (D1)-(D3) at $g=1$ we obtain

$$\tilde{\lambda}_1(g=1) = \tfrac{1}{27b}\left[(a-1)(7a+6c-13)\right] \tag{D4}$$

$$\tilde{\lambda}_3(g=1) = \tfrac{1}{27b}\left[(a-1)(7a-12c+5)\right] \tag{D5}$$

$$\lambda_{min}(g=1) = \tfrac{1}{27b}\left[(a-1)(7a+6c-13)\right]+B \tag{D6}$$

(D4) and (D6) show that $\tilde{\lambda}_1$ and λ_{min} coincide at $g=1$ if $B=0$. Note that $\tilde{\lambda}_3 \geq \tilde{\lambda}_1$ if $c \leq 1$ and $g=1$. At minimum trade openness $g_{trade} = 3c/(a+2)$ the terms (D1) and (D2) become

$$\tilde{\lambda}_1(g=g_{trade}) = \tfrac{1}{81b}(8a+3c-11)(4a-3c-1), \qquad \tilde{\lambda}_3(g=g_{trade}) = \tfrac{1}{81b}(5a-6c+1) \tag{D5}$$

Comparing these terms we find that $\tilde{\lambda}_1(g=g_{trade}) > \tilde{\lambda}_3(g=g_{trade})$ if $\tilde{c} < c$ and, vice versa, $\tilde{\lambda}_1(g=g_{trade}) < \tilde{\lambda}_3(g=g_{trade})$ if $c < \tilde{c}$, where the threshold level $\tilde{c}$ is given by

$$\tilde{c} \equiv \tfrac{1}{15}\left(8a+7-3\sqrt{11}(a-1)\right) \qquad \text{with } 0<\tilde{c}<1 \text{ due to } 2<a<4 \tag{D6}$$

Furthermore, using (D1) and (D2) and the parameter restriction $g_{trade} < g < 1$ implies

$$\partial\tilde{\lambda}_1/\partial g = -\tfrac{2c}{27bg^2}\left[5a+\tfrac{3c}{g}-8\right] < 0\ , \qquad \partial\tilde{\lambda}_3/\partial g = -\tfrac{8c}{27bg^2}\left[a-\tfrac{3c}{g}+2\right] < 0 \tag{D7}$$

In words, with an unbiased government ($B=0$) the foreign firm wins the auction at zero trade costs provided it has some productivity advantage ($c<1$). At maximum trade costs the domestic firm wins the auction, provided the productivity advantage of the foreign firm is not too strong (provided $c > \tilde{c}$). With a strong productivity advantage $c < \tilde{c}$ the foreign firm would win the auction over the whole range of g. Without productivity advantage firm 3 never wins the auction. The maximum bids of both firms are higher the higher trade costs are.

D.2. Crossing point Z: We now provide the analytical expression for the point in fig.1b where $\tilde{\lambda}_1$ and $\tilde{\lambda}_3$ cross. Setting (D1) equal to (D2) and solving for g we find that there is at most one solution that can fall in the relevant range $g_{trade} < g < 1$. This solution is given by

$$\tilde{\lambda}_1 = \tilde{\lambda}_3 \quad \Leftrightarrow \quad g = \tilde{g} = \frac{15c}{16 - a + \sqrt{a^2 + 238a - 30c(8a+7) + 225c^2 - 14}} \tag{D8}$$

With $2 < a < 4$ the solution $\tilde{g}$ falls into the relevant range $g \in [g_{trade}, 1]$ if $\tilde{c} < c < 1$ and it falls out of that range if $0 < c < \tilde{c}$. With $c > \tilde{c}$ it follows that $\tilde{\lambda}_1 > \tilde{\lambda}_3$ if $g_{trade} < g < \tilde{g}$, whereas $g_{trade} < \tilde{g} < g < 1$ implies $\tilde{\lambda}_1 < \tilde{\lambda}_3$. Provided $g_{trade} < \tilde{g} < 1$ it can also be shown that $\partial\tilde{g}/\partial c > 0$ and $\partial\tilde{g}/\partial a < 0$. In words, the range of g in which the foreign firm outbids the domestic firm is larger (i.e., $\tilde{g}$ is smaller) the stronger the initial productivity advantage of the foreign firm is (the lower c is) and the larger the market size is (the larger a is).

D.3. Government involvement: Firstly, using (D1) and (D3) it can be shown that $\partial\tilde{\lambda}_1/\partial g < \partial\lambda_{\min}/\partial g = -\left[c(3c + g(a-4))\right]/9g^3 < 0$, i.e., the curve $\lambda_{\min}$ is decreasing in g and it is always flatter than λ_1 until the two curves collapse at $g = 1$ (see above). Secondly, using (D2) and (D3) we obtain two solutions for g where $\tilde{\lambda}_3 = \lambda_{min}$. These solutions are given by

$$\hat{g}_1 = \frac{33c}{5a + 28 + \sqrt{\Lambda}} \qquad \text{and} \qquad \hat{g}_2 = \frac{33c}{5a + 28 - \sqrt{\Lambda}} \tag{D9}$$

where $\Lambda \equiv 25a^2 + 2a(734 - 759c) + 33c(33c - 20) - 404 - 1782bB$. Assuming a value of B that is low enough to warrant a real root ($\Lambda > 0$) we have $\hat{g}_1 < \hat{g}_2$.

D.3.1. No bias: When $B = 0$ we find that $\hat{g}_2 > 1$ and $\hat{g}_1 < \tilde{g}$ must be true. I.e., one solution always falls out of the relevant range $g_{trade} < g < 1$. The other solution may fall into that range, but this crossing point is then always to the left of $\tilde{g}$ as given in (D8), i.e., $\tilde{\lambda}_3 < \tilde{\lambda}_1$ would hold. Hence, the government constraint can never become effectively binding with $B = 0$.

D.3.2. Medium bias: With $B > 0$ such that $\Lambda > 0$, eventually both crossing points fall into the relevant range: $g_{trade} < \hat{g}_1 < \hat{g}_2 < 1$. Since $\partial\hat{g}_1/\partial g > 0$ and $\partial\hat{g}_2/\partial g < 0$ these crossing points move closer together as B increases. There are two possible cases: $g_{trade} < \hat{g}_1 < \tilde{g} < \hat{g}_2 < 1$ and $g_{trade} < \tilde{g} < \hat{g}_1 < \hat{g}_2 < 1$. The former case corresponds to fig.1c where the foreign takeover is approved when firm 3 first wins the auction (at $g = \tilde{g}$). In the latter case, which is not illustrated graphically, government would still reject the takeover at $g = \tilde{g}$ and only approve it when trade costs have fallen below $\hat{g}_1$. However, also in this case there is a lower threshold level $\hat{g}_2 < 1$ below which the government again blocks the foreign takeover. The case $g_{trade} < \tilde{g} < \hat{g}_1 < 1 < \hat{g}_2$ can never occur as it is inconsistent with our parameter restrictions.

D.3.3. Strong bias: As B increases even further, we eventually have $\Lambda \leq 0$ and no crossing point of $\tilde{\lambda}_3$ and λ_{min} exists but $\tilde{\lambda}_3 < \lambda_{min}$ generally holds. This case corresponds to fig. 1a and occurs whenever $B > \overline{B} = [25a^2 + 2a(734 - 759c) + 33c(33c - 20) - 404]/1782b > 0$.

Appendix E: Endogenous government bias

E.1. Welfare gain of allowing the takeover: Using (14), (18) and (19) the proper welfare difference $\Delta\Omega^* = \Omega^{\text{int}}{}^* - \Omega^{nat} = \Delta CS + \left(\tilde{\lambda}_3 - \tilde{\lambda}_1\right)$ can be expressed analytically as follows:

$$\Delta\Omega^* = \tfrac{1}{54b}\left[a\left(36-46c\right) + c\left(33c-20\right) + \tfrac{c}{g}\left(10a+56c\right) + 33\left(\tfrac{c}{g}\right)^2 - 36\right] > 0 \qquad \text{(E1)}$$

This term must be positive under the restrictions $2 < a < 4$, $\tilde{c} < c < 1$ and $\tilde{g} < g < 1$, where $\tilde{g}$ is given in (D8) and $\tilde{c}$ is given in (D6). Recall that $\tilde{c} < c$ ensures that $g_{trade} < \tilde{g} < g < 1$. Under the same parameter restrictions it can be shown that $\partial\Delta\Omega^*/\partial a = \tfrac{1}{27}(18 - 23c + \tfrac{5c}{g}) > 0$, and $\partial\Delta\Omega^*/\partial c = -\tfrac{1}{27g^2}[33c\left(1-g^2\right) - g\left(28 - 10g + a\left(5-23g\right)\right)] < 0$. That is, the welfare gain $\Delta\Omega^*$ is increasing market size a and in the strength of the productivity advantage of firm 3.

Furthermore it follows from (E1) that $\partial\Delta\Omega^*/\partial g = \tfrac{c}{27g^3}\left[33c - g\left(5a+28\right)\right]$. Hence, $\partial\Delta\Omega^*/\partial g > 0$ if g is small and $\partial\Delta\Omega^*/\partial g < 0$ if g is large. The term reaches a maximum at $\breve{g} = 33c/\left(5a+28\right)$, which is always larger than $\tilde{g}$. Hence the welfare gain $\Delta\Omega^*$ is hump-shaped in g in the range $\tilde{g} < g < 1$.

E.2. Government decision with lobbying: Using (E1) and (22) with $k_1 = 0$ the term $\Delta\Theta$ in (23) can be rewritten as:

$$\Delta\Theta = \eta\cdot\left(\Delta CS + \tilde{\lambda}_3 - \tilde{\lambda}_1\right) - \left(1-\eta\right)\cdot\left(\tfrac{1}{2}\cdot\pi^{nat}_{\{1+2\}} - \pi^{int}_1\right) = \eta\cdot\left(\Delta CS + \tilde{\lambda}_3\right) + \pi^{int}_1 - \left(1+\eta\right)\cdot\left(\tfrac{1}{2}\pi^{nat}_{\{1+2\}}\right)$$

Clearly, $\Delta\Theta > 0$ if $\eta = 1$ and $\Delta\Theta < 0$ if $\eta = 0$. At $\eta = \tfrac{1}{2}$ this term becomes

$$\Delta\Theta\left(\eta = \tfrac{1}{2}\right) = \tfrac{1}{324b}\left[148a - 17a^2 - 6c\left(19a + 20 - 36/g\right) + 9c^2\left(13 - 12/g^2\right) - 122\right] < 0 \qquad \text{(E2)}$$

With $2 < a < 4$, $\tilde{g} < g < 1$ and $\tilde{c} < c < 1$ the term (E2) is unambiguously negative, which implies that $\mu^{nat}_1 > \Delta\Omega^*$ holds over the whole range of g. In other words, $\Delta\Theta \geq 0$ requires a preference parameter η that is sufficiently larger than $1/2$.

Furthermore, one can prove that $\Delta\Theta$ is hump-shaped in g. Differentiating $\Delta\Theta$ we obtain

$$\partial\Delta\Theta/\partial g = \tfrac{c}{g^3}\left[\left(30c\eta + 3c\right) - g\left(10\eta\left(a+2\right) - 5a + 8\right)\right]. \qquad \text{(E3)}$$

From (E3) it follows that $\partial\Delta\Theta/\partial g = 0$ at $g = g' = \left(30c\eta + 3c\right)/\left(10\eta\left(a+2\right) - 5a + 8\right) < 1$ and it can be checked that $\partial^2\Delta\Theta/\partial g^2 < 0$ at $g = g'$, hence $\Delta\Theta$ achieves a global maximum at $g' < 1$. At this maximum we find that $\sup(\Delta\Theta) > 0$ if η is sufficiently large and $\sup(\Delta\Theta) < 0$ otherwise (the latter case corresponds to the broken line in fig.2a). Provided $\sup(\Delta\Theta) > 0$ there must be two values of g such that $\Delta\Theta = 0$. There are three possible cases: i) both values fall into the relevant range $\tilde{g} < g < 1$ in which case $\Delta\Theta > 0$ holds in the range in between those two values, see the thick solid line in fig.2a as an example; ii) both fall out of that range in which case $\Delta\Theta > 0$ for all feasible values of g, see the thin solid line in fig. 2a; and iii) one of the solutions falls into the relevant range and the other falls out of it, as for example in the case of the dotted line in fig.2a.