THE POLITICAL ECONOMY OF INTERNATIONAL TRADE AND FACTOR MOBILITY

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Abstract. Free trade in goods and factors is efficient. When we move away from economic theory and consider the policies actually followed by governments, we observe distortions being implemented both on goods and factors trades. It is natural then to question the relative merits of the two types of intervention, and the normative literature has provided only partial answers. We ask then why is the international flow of goods and factors not free, and the political economy literature has looked at the two issues only separately. In studying the determination of trade policy, a theoretical paradigm has emerged, focusing on the role of influence driven contributions. This approach has also found strong empirical support. The literature on the political economy of factor mobility, on the other hand, is fragmented. Distortions in labor and capital flows are typically the subject of different studies, and only recently a unified framework has been proposed. More work has to be done in this area as well as in integrating the political economy of trade and factor movements.

Keywords. Political economy; International trade; Trade policy

1. Introduction

Free trade in goods is widely recognized as beneficial[1], at least as long as some form of redistribution takes place, and institutions like the GATT and the WTO have been established to promote the development of a global market place in commodities. Free movement of capital across nations is considered welfare-enhancing, at least as long as it takes the form of long term investment instead of short term financial speculation. Migration is also beneficial, at least from the point of view of the host country.[2]

   When we move away from economic theory and consider the policy actually followed by governments, we observe distortions being imposed both on goods and factor trades. It is natural then to question the relative merits of the two types of intervention. In other words, we would like to be able to rank, from a nation's welfare point of view, the various policy instruments available to governments.

This issue is explored in section 2 of this paper, where we conclude that the existing literature has provided only a partial answer, and more research is needed.

Next, we look at a different, but related question, namely why is the international flow of goods and factors not free? In particular, in section three we consider the more recent developments in the political economy of trade policy. We put particular emphasis on the models in which trade policy is determined as the result of *influence driven* contributions. The seminal paper in this literature is by Grossman and Helpman (1994), but in the last few years research in this area has been particularly intense, both in terms of new theoretical developments as well as empirical applications. The 'protection for sale' model is becoming the new paradigm in the literature on trade policy, not least because it has found robust and extensive support in the empirical tests performed so far.

In section 4 we look at the literature on the political economy of international factor mobility, where – unlike what has happened in trade – no paradigm has emerged yet. Papers in this area tend to look at specific, narrowly defined questions. Distortions in international labor and capital markets are usually addressed separately and a general framework has only been proposed very recently. More work has to be done to in this area, as well as in trying to integrate the political economy of trade and factor movements. Section 5 provides concluding remarks.

2. Trade in goods and factor mobility

Economic theory suggests that international trade in commodities and international factor movements are closely related phenomena. In a simple two–country world in which agents share identical homothetic preferences and there are constant returns to scale in production, the degree to which trade and factor mobility are substitutes depends on assumptions concerning: (1) the relative input endowments; (2) the technologies used in the two countries; and (3) the relation between the number of final goods and factors.[3] In a two country, two good, two factor setting ($2 \times 2 \times 2$), a typical textbook formulation of the well known factor price equalization (FPE) theorem states that, if the two countries have access to the same technology, and factor endowments are not too far apart, free trade in final goods equalizes factor prices. In other words, trade in factors and trade in commodities are perfect substitutes. This result has been generalized[4], but it has been shown that a crucial role is played by the relative number of commodities and factors involved. In particular, if the number of goods is smaller than the number of factors, we should not expect FPE to hold.

The next natural question to ask is whether it is possible to construct a welfare ranking of free trade and factor mobility if FPE does not hold. This is clearly not a simple problem, and to the best of our knowledge the only study that has attempted the development of a partial ordering of the various instruments is Wong (1983). He considers a standard $2 \times 2 \times 2$ setting in which Home is a small country, while Foreign is assumed to be large. Home has a Hicks-neutral

technological advantage in the production of one of the two goods. Following Wong and without loss of generality, we will assume that this is the labor intensive good. The other good is produced with the same technology in both countries and factor endowments are also supposed to be identical. Moreover, we will assume that production is diversified in both countries and that the representative agent shares the same, identical Cobb-Douglas preferences in both countries. The issue concerns then the comparison of the following policies, from the point of view of domestic welfare:

1. free trade but total absence of factor movements (T)
2. autarky in goods and capital, but free labor movement (L)
3. autarky in goods and labor, but free capital movement (K_i)
4. autarky in labor, but free trade plus free capital movement ($T + K_i$)
5. autarky in capital, but free trade plus free labor movement ($T + L$)

The label K_i has been used for the free movement of capital because Wong (1983) distinguishes also between the situation in which capitalists move with their production factor and consume in the destination country ($K_i = K_1$) and the situation in which they do not move and the factor return is remitted back to the country in which they reside ($K_i = K_2$). Notice that, in comparing policies, we cannot allow for free trade and free movement of both factors. Given the assumption that Home has a technological advantage in the production of one good, this would lead to an inflow of both factors, until the 'small' country assumption would be violated.[5]

From the point of view of aggregate welfare in Home, the policies can be ranked as follows:

1. $T + L \geq T + K_i \geq T \geq K_2 \geq K_1$
2. $T + L \geq L$
3. L cannot be ranked uniquely with T or K_i

This result can be rephrased as follows. Let's call the factor that is used intensively in the production of the exportable good the 'indirectly exported' factor[6], while let us label the other factor[7] the 'indirectly imported' factor. In general, we cannot establish which factor inflow will increase Home's welfare more, nor can we uniquely rank free trade or the free inflow of the indirectly exported factor. But we can conclude that free trade is preferred to free inflow of the indirectly imported factor. The intuition for this latter result is that free trade can be seen as the sum of the export of the 'indirectly exported' factor and of the import of the 'indirectly imported' factor. While the inflow of the indirectly imported factor alone will reduce its domestic price, free trade will lead to an even lower price for that factor. Finally, and intuitively, free trade in goods and free movement of either of the two factors dominate free trade alone. Notice how, even in the context of this simple model, we need pretty strong assumptions on preferences in order to be able to construct a welfare ranking.

This analysis provides a ranking of alternative policies only under a set of rather strong assumptions. Nothing is known, from a normative point of view, if we generalize the commodity and factor spaces to higher dimensions. More research is called for in this area and a general ranking is needed if we want to assess the relative 'inefficiency' of government policies towards international flows. Lacking such a theory, we proceed with our review of the political economy explanations proposed for the observed distortions in cross-border flows.

3. Influence driven contributions and trade policy

In this section, rather than providing a comprehensive survey of the large literature on trade policy formation[8], we focus our discussion on the more recent studies addressing the role of *influence driven* contributions. This framework has gained increasing support in recent years both because of its theoretical appeal and because it has found consistent support in the empirical evidence. From a theoretical perspective, given the institutional constraints, contributions should not be thought of as influencing election outcomes. In many countries strict limits exist on the amounts that can actually be contributed to a candidate, and this results in each contribution being small relatively to the total. In other words, each individual contribution has only a marginal effect on the election outcome. This point is formally made by Grossman and Helpman (1996), who show how with a large number of organized interest groups, the electoral motive for campaign contributions actually becomes negligible. At the same time, there is abundant evidence that in the United States interest groups focus their efforts towards influencing policy choice by elected officials rather than influencing electoral outcomes. For instance, during the 1997–98 political cycle, of the 220 million dollars spent by political action committees, 77% went to incumbent politicians. Excluding open seats, incumbents received more than 7 times as much money as challengers.[9] Magelby and Nelson (1990) have also documented how political action committees switch contributions to the winner, even if they have previously supported the other candidate. Furthermore, the majority of contributions occurs during the first half of the political cycle.

The role of influence driven contributions in shaping trade policy has been highlighted by Grossman and Helpman (1994). The model developed in this paper has become the workhorse of the literature, and has been extended to a multi-country setting by Grossman and Helpman (1995). Levy (1999) has pointed out some of the theoretical limitations of this framework and we will review this paper later.

The first empirical tests of the Grossman and Helpman (1994) model have granted strong support to the role of lobbying in shaping international trade policy. In this respect, we will discuss the estimations conducted by Goldberg and Maggi (1999) and Gawande and Bandyopadhyay (2000) using US manufacturing data. The Australian data used by McCalman (2000) also lend credibility to

the model, while the more recent work of Gawande, Krishna, and Robbins (2001) has highlighted the empirical relevance of foreign lobbying activities in shaping US trade policy.

3.1 *Protection for Sale*

In their seminal contribution Grossman and Helpman (1994) model the formation of trade policy using the common agency setting developed by Bernheim and Whinston (1986). In a common agency the policy maker acts as an agent and some or all the members of his constituency can be viewed as his principals. Principals lobby the agent by offering contributions in return for favors, within limits that concern both the set of feasible gifts and the set of policies that can be influenced. Payments can take the form of illegal bribes or, more often, the form of legal campaign support. Grossman and Helpman (1994) use this framework to model the endogenous formation of tariff policy for a small country.

The economy is populated by individuals with identical preferences and potentially different factor supplies. The utility function is quasi-linear and takes the form

$$u(\mathbf{x}) = x_0 + \sum_{i=1}^{n} u(x_i) \tag{1}$$

where $u(x_i)$ is a differentiably increasing and strictly concave function. The economy consists of $n+1$ sectors. Good 0 – the numéraire – is manufactured using labor alone according to an identity production function, while the constant returns to scale technologies for the other n goods each require labor and a sector specific input. The numéraire is freely traded in international markets. Let $\mathbf{p}$ denote the domestic price vector. In an exogenously given[10] subset L of the remaining sectors, the owners of the specific factor are assumed to be able to overcome the free rider problem, becoming organized. The joint welfare of an organized group supplying specific factor i is

$$V_i(\mathbf{p}) = \ell_i + \pi_i(\mathbf{p}) + \alpha_i(s(\mathbf{p}) + r(\mathbf{p})) \tag{2}$$

where ℓ_i is the total labor income of the owners of specific factor i, $\pi_i(\mathbf{p})$ is factor i's income, $s(\mathbf{p})$ is consumer surplus and $r(\mathbf{p})$ are tariff revenues. Here α_i is the proportion of the population supplying the specific factor i. The lobby chooses a contribution schedule $B_i(\mathbf{p})$ that maximizes the net payoff of its members:

$$N_i(\mathbf{p}) = V_i(\mathbf{p}) - B_i(\mathbf{p}) \tag{3}$$

In choosing the optimal policy, the politician trades off aggregate welfare against the lobbies' contributions according to a linear objective function[11]

$$G = a \sum_{i=0}^{n} V_i(\mathbf{p}) + \sum_{i \in L} B_i(\mathbf{p}) \qquad (4)$$

A subgame perfect Nash equilibrium of this game is a collection of contribution schedules $\{B_i(\mathbf{p}^0)\}_{i \in L}$ such that each schedule $B_i(\mathbf{p}^0)$ maximizes the i-th lobby's net payoff, given the contribution schedules chosen by the others and the expected choice of the government, together with a domestic price vector $\mathbf{p}^0$ that maximizes the objective function of the government G.

Without imposing more structure on the model, a large set of equilibrium outcomes is possible. Grossman and Helpman (1994) restrict this set by focusing their attention on contributions schedules that are differentiable, and that are therefore *truthful* at least around the equilibrium point. In other words, at least around the equilibrium point, the effect of a marginal change in policy on the lobbies' contributions matches the marginal change in their gross welfare.[12] The other advantage of the differentiability assumption of course lies in making the application of the results obtained by Bernheim and Whinston (1986) straightforward. In particular, it is easy to show that the equilibrium rate of protection is given by

$$\frac{t_i}{1 + t_i} = \left(\frac{I_i - \alpha_L}{a + \alpha_L} \right) \frac{z_i}{e_i} \qquad (5)$$

On the left-hand side of this expression, t_i is the ad-valorem tariff rate. On the right-hand side, I_i is a dummy variable equal to one if sector i is organized, and equal to zero otherwise. Also, α_L is the proportion of the population involved in lobbying activities, $z_i = \frac{x_i(p_i)}{m_i(p_i)}$ is the inverse of the import penetration ratio, and $e_i = -\frac{m_i'(p_i)p_i}{m_i(p_i)}$ is the price elasticity of import demand. The tariff (subsidy) is determined by a modified Ramsey rule: the higher the elasticity of import demand (export supply), the smaller the ad valorem deviation from free trade.

Turning to the role of politics, we see that all organized sectors obtain protection, while for all non lobbying sectors imports (exports) are subsidized (taxed).[13] The intuition is that lobbying factor i asks for high prices for the good i, of which it is a net seller. But lobbying factor i looks for low prices for all other goods, of which it is a net buyer. Furthermore, for lobbying sectors, protection is increasing in the share of domestic production in domestic consumption.[14] Finally, as it is intuitively appealing, protection is decreasing with the weight attached by the government to aggregate welfare (a) and with the proportion of the population involved in lobbying activities (α_L). In the limit, if all members of the constituency lobby, the government does not distort international trade, even though the lobbies continue to transfer resources to the elected official. The intuition for this last result is that the various interest groups' requests neutralize each other in equilibrium, yet contributions are still being made by the lobbies in order to avoid being harmed by other organized groups. This is clearly a collective action problem: All would gain if an agreement not to lobby could be enforced.

3.2 *Trade wars and trade talks*

In the model outlined in the previous section, the formation of trade policy has been regarded as a purely domestic matter. More realistically, trade policy should be modelled as the result of a two-tier process. On the one hand, there is the interaction between domestic interest groups and an elected official, on the other hand national governments face international constraints when they set trade policies. This is especially true for large countries, but the current institutional setting induces governments in general to negotiate trade policies, for instance during the various GATT–WTO 'rounds'. To highlight this second aspect, Grossman and Helpman (1995) have developed a two country version of their 'protection for sale' model that we are going to review next.

   The world is made up of only two countries, Home (H) and Foreign (F), and for both of them the agents' characteristics and the political process are modeled as in the previous section. We will discuss first the case in which domestic lobbies and politicians realize that their policies are going to impact the terms of trade, but set them in a non cooperative fashion.[15] Let ω_i be the international price of good i, for $i = 1, \ldots, n$. Considering a two country setting implies that for all goods i, ω_i will be determined endogenously as the solution of

$$\sum_{j=H,F} m_i^j((1 + t_i^j)\omega_i) = 0 \tag{6}$$

In particular, the international price for good i is implicitly defined as a function $\omega_i(t_i^H, t_i^F)$ of the ad valorem tariffs imposed by the two countries. A non cooperative trade equilibrium is then a collection of contribution schedules and domestic policies for each country that represents a political response to the trade policy of the other. In equilibrium, the tariff (subsidy) on good i is set by country j according to the following equation:

$$t_i^j = -\frac{I_i^j - \alpha_L^j}{a^j + \alpha_L^j} \frac{x_i^j}{\omega_i m_i^j} + \frac{1}{e_i^k} \tag{7}$$

where $i = 1 \ldots n$ j, $k = \{H, F\}$, m_i^j is the price derivative of import demand, $j \neq k$ and e^k is the other country's import demand elasticity. The reader will immediately recognize the similarity of equations (7) and (5). The ad valorem tax (subsidy) rates are now a function of two terms, respectively representing the political support and the terms of trade motives for trade intervention (the latter comes from the well-known optimal tariff formula). If country j is a net importer of good i ($m_i^j < 0$), and the sector is organized, the import competing industry will be granted a tariff (since $e_i^k > 0$ if k exports good i). On the other hand, if the country is a net exporter of the good ($m_i^j > 0$) and the sector is not organized, then it will suffer an export tax (now $e_i^k < 0$ since k is a net importer). In the first case, terms of trade considerations reinforce the industry's lobbying efforts. In the second,

the government's desire to drive up world prices through an export tax are matched by the interests of the organized groups whose members, as net buyers of the good, push to keep the domestic price low. Only in situations in which exporting sectors are organized and the importing sectors are not, do the organized group's and general interests conflict.[16]

Notice that the policy implemented by country j in equation (7) depends on the policy chosen by country k through its impact on the international price level ω_i. To solve for the equilibrium values, more structure needs to be added to the model. In particular, Grossman and Helpman (1995) discuss more in detail the implications for the case in which import demands and output supply have constant elasticity. For the sake of clarity, we consider the market for good i and assume that Home imports this good, while Foreign exports it. Furthermore, we will also assume that in both countries sector i is actually organized.[17]

Figure 1 – adapted from Grossman and Helpman (1995) – illustrates how the equilibrium tariff policy is determined. On the vertical axis t^F represents the ad valorem tax (subsidy) levied by the foreign country, while t^H on the horizontal axis represents the ad valorem tax imposed by home. The loci $P^H P^H$ and $P^F P^F$ represent, respectively, the reaction curves determined by the political equilibrium for Home and Foreign. Any point of intersection W represents a world equilibrium in the case of a trade war. Without politics, the optimal policy would be given by the intersection of the lines $B^H B^H$ and $B^F B^F$ – this is the standard optimal tariff[18], with Home imposing an import tariff and Foreign an export tax equal to the inverse of the elasticity of the other country's supply (demand). Including politics in the picture tilts policies in favor of the organized sectors: at
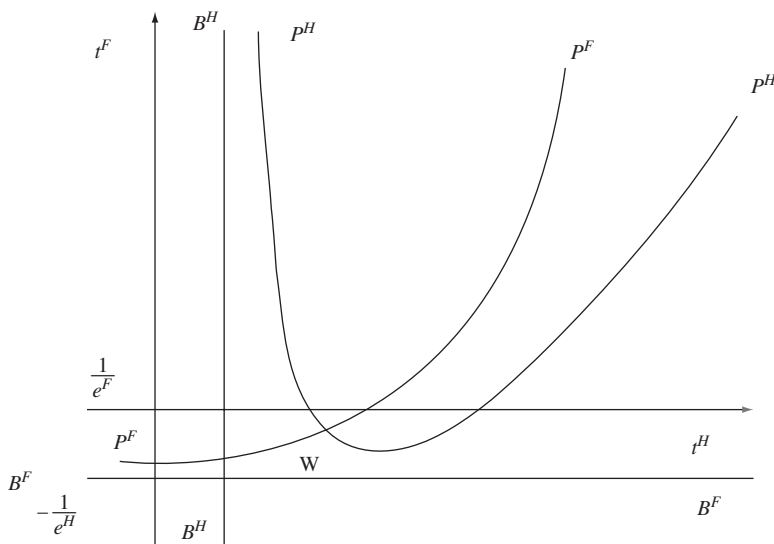
Figure 1. Trade war.

Home we observe a higher tariff, while in Foreign the export tax is lowered and potentially it could became an export subsidy.

We can use this diagram to analyze the impact on the world equilibrium of a change in the political structure in one country. To this end, let us assume that the weight attached to political contributions in the objective function of Home's government increases. This shifts the locus $P^H P^H$ upwards to the right. The resulting equilibrium moves along the locus $P^F P^F$. In the new international equilibrium, Home imposes a higher tariff on the imports of good i, while Foreign reduces its export tax (or increases its export subsidy). The intuition for this result is that the domestic lobby perceives a smaller cost of lobbying. At the same time, the foreign lobbies and government expect a more protectionist attitude from Home and this shifts the political calculus there. Notice also that, *ceteris paribus*, a higher tariff in Home implies a lower international price. This decreases both the social cost and the benefit arising to the lobby from an export subsidy. In particular the former happens to be bigger than the latter.[19] In other words, the industry's willingness to pay for the subsidy declines by less than the cost incurred by the government in providing the favor. This results in Foreign adopting a new trade policy that is more favorable to its exporters. This simple comparative statics exercise has shown the usefulness of this framework in predicting how trade policies adopted by one country are actually influenced by changes in the political environment of the other.

So far we have limited our attention to the case in which trade policies are set non-cooperatively by the two countries. In so doing politicians are not only using an inefficient instrument to redistribute income domestically to preferred groups, but they are also imposing an *avoidable* political cost on each other. If they were aware of this, it would seem natural for politicians to sit at the negotiating table to discuss trade policy. The interaction in this case becomes more complex: the governments are aware of the 'domestic' repercussions of the policies negotiated with the foreign country, and campaign contributions are going to be strategically designed to influence politician's behavior at the negotiating table. In general, the optimal schedules will depend upon the institutional setting. As long as the negotiating procedure allows the politicians to choose from outcomes that are efficient at least from their perspective, Grossman and Helpman (1995) have shown that the equilibrium policy must satisfy

$$t_i^H - t_i^F = -\left(\frac{I_i^H - \alpha_L^H}{a^H + \alpha_L^H}\right)\frac{x_i^H}{\omega_i m_i^H} + \left(\frac{I_i^F - \alpha_L^F}{a^F + \alpha_L^F}\right)\frac{x_i^F}{\omega_i m_i^F} \tag{8}$$

Notice that this equation characterizes only the relative degree of protection granted to sector i in the two countries. The first term describes the political influence of sector i in Home, while the second captures the political influence of sector i in Foreign. The main message is that – relative to free trade – the negotiation favors the industry with a greater political clout: The left hand side is positive if the political clout of sector i is greater at Home than in Foreign.

Clearly, if the owners of the specific factor are organized in one country but not in the other, then the organized group will always see its position improve with respect to free trade. When the sector is organized in both countries, the political clout of a lobby is an increasing function of the size of domestic output. At the same time, it is inversely related to the weight attached by the domestic government to aggregate welfare, to the fraction of the voting population belonging to organized groups, and to the price elasticity of import demand. When the two industries enjoy the same political clout in both countries, then internal prices, world prices, industry outputs, and profit levels will all be the same as in free trade. Finally, notice the absence of the terms-of-trade motive for trade policy that was highlighted in the case of a trade war. The reason is that a policy induced terms of trade effect imposes a deadweight loss on the world economy. An efficient negotiation like the one we just discussed will eliminate this source of deadweight loss.

3.3 Difficulties

In the two models outlined so far, the elected official can choose from the full set of trade policy instruments. The equilibrium prediction is that, as protectionist instruments, export subsidies should be as common as import taxes. This is at odds with the experience of most countries, where import tariffs have been commonly used, whereas export subsidies have been rare and quantitatively much smaller.[20] Furthermore, from a more theoretical standpoint, allowing the elected politician a full set of instruments creates some paradoxical outcomes in the two country setting, as has been pointed out by Levy (1999).

To see this point, let's consider a symmetric setting, in which Home and Foreign are identical in every respect but one. The only difference is that, while in the organized sector i Home is a net importer, it is a net exporter in the organized sector j. Furthermore, following Levy, let's assume that

$$x_j^H = x_i^F > x_i^H = x_j^F$$

We discuss first the situation in which trade policy is set in a non-cooperative fashion, focusing on the case of good i (the case of good j is symmetric). We want to sign the expression $t_i^H - t_i^F$. If this expression is positive, then we will conclude that there is net trade *protection*, while if the sign of this quantity is negative, we have net trade *promotion*. In the symmetric case, using (7) we have

$$t_i^H - t_i^F = -\frac{1 - \alpha_L}{(a + \alpha_L)\omega_i m_i}(x_i^H - x_i^F) + \frac{1}{e_i^F} - \frac{1}{e_i^H} \qquad (9)$$

The first term is negative, because $\alpha_L \in [0, 1)$ and $m_i < 0$, while by assumption $x_i^H - x_i^F < 0$. On the other hand, the second term of the expression, representing the terms of trade motive for intervention, is positive. This means that the overall

sign of $t_i^H - t_i^F$ is undetermined, but the surprising (even counterintuitive) result is that introducing politics into the model has a net trade *promotion* effect.

If we consider the case in which the governments are allowed to set their policies cooperatively, the result is even stronger:

$$t_i^H - t_i^F = -\frac{1 - \alpha_L}{(a + \alpha_L)\omega_i m_i}(x_i^H - x_i^F) \tag{10}$$

In this case, lobbying is clearly a force for net trade *promotion*! In an attempt to reconcile the model with the evidence, Levy considers next the situation in which protectionist governments can only implement import tariffs, while export subsidies are ruled out. In the non-cooperative case, this leads to the tariff equation

$$t_i^H = -\frac{(1 - \alpha_L)x_i^H}{(a + \alpha_L)\omega_i m_i} + \frac{1}{e_i^F} \tag{11}$$

In this case the left-hand side is unambiguously positive. So, introducing the political economy component actually leads to an increase in the level of protection.

In the cooperative case, on the other hand, the same net trade protection is achieved as in the case with export subsidies:

$$t_i^H = -\frac{1 - \alpha_L}{(a + \alpha_L)\omega_i m_i}(x_i^H - x_i^F) \tag{12}$$

Now Home is imposing an import subsidy on good i. In the cooperative equilibrium with limited policy instruments, countries not only remove domestic tariff barriers, but go as far as subsidizing imports. The intuition for this result is that export oriented lobby groups do not explicitly press for a reduction in their country's tariffs. They instead make their contributions dependent upon the *foreign* tariff or subsidy they face, and the only means to achieve a reduction in foreign tariffs is through a reciprocal drop in domestic barriers.

Clearly the theoretical results reviewed in this section highlight the limitations of the approach proposed by Grossman and Helpman. On the other hand, in the empirical tests performed so far, the protection for sale model has found surprisingly strong support. We turn to these studies in the next section.

3.4 Empirical Studies

Goldberg and Maggi (1999) and Gawande and Bandyopadhyay (2000) performed the first successful empirical tests of the protection for sale model. Esfahani (2001) has extended their analysis by allowing politicians to value rents differently across industries, while Gawande, Krishna, and Robbins (2001) have considered a model in which lobbying by foreign entities is also taken into account. A comparison of the performance of this model with older frameworks suggested in the literature

has been performed by Eicher and Osang (2000), while Gawande and Krishna (2001) provide an excellent survey of the literature.

Goldberg and Maggi (1999) estimate a modified version of (5)

$$\frac{t_i}{1 + t_i} e_i = \gamma \frac{x_i}{m_i} + \delta \frac{I_i x_i}{m_i} + \epsilon_i \qquad (13)$$

where $\gamma = \frac{-\alpha_L}{a + \alpha_L}$ and $\delta = \frac{1}{a + \alpha_L}$. Notice that in this specification, the elasticity of import demand appears on the left-hand side of the estimating equation. This is only one of the possible approaches[21], and is justified by the fact that the elasticities are endogenous and measured with error. The theoretical model implies three restrictions on the sign of the coefficients: $\gamma < 0$, $\delta > 0$ and $\gamma + \delta > 0$. Furthermore, from the reduced form coefficient estimates one can construct estimates for the structural parameters of the model a and α_L. The construction of the data set used by Goldberg and Maggi (1999), a 3 digit cross-section of US manufacturing for 1983, involved several difficulties. Two important issues concerned: (1) the choice of the appropriate measure of protection; and (2) the choice and 'discretization' of the variable describing political activity. Concerning the first problem, and given that the estimating equation is derived from a small country model, Goldberg and Maggi (1999) have looked at a measure of non-tariff barriers.[22] In particular, they have used coverage ratios.[23] Concerning political activity, it has been measured using political action committee contributions by industry, experimenting with different thresholds to construct the organizational dummy.

In performing the estimation, Goldberg and Maggi (1999) are rather careful in dealing with the endogeneity of the organizational dummy and the import penetration ratio, specifying reduced form equations for each one of the variables. At the same time, they also take into account that the variable describing protection is censored. The results obtained broadly support the Grossman and Helpman (1994) model. A typical set of point estimates is reported in Table 1, with standard errors in parentheses. The estimates for γ and δ turn out to be of the expected sign, while the third sign prediction, i.e. $\gamma + \delta > 0$, finds only weak support in the data. In the words of Goldberg and Maggi (1999, page 1146) '...our findings support the model's prediction that the relationship between protection and import penetration depends on whether or not the sector is politically organized; the positive sign and the statistical significance of the estimate of the parameter δ

Table 1. Goldberg and Maggi (1999)

Variable	Coefficients
x_i/m_i	$\gamma = -0.0133\ (0.0059)$
$I_i/(x_i m_i)$	$\delta = 0.0155\ (0.0077)$
Implied $a/1 + a$	$0.984\ (0.007)$
Implied α_L	$0.858\ (0.217)$
n	107

indicate that there is a distinct pattern of protection in organized versus non organized sectors'. In terms of the structural parameters of the model, it turns out that the weight attached by the government to (gross) welfare is many times larger than the weight attached to lobbies' total contributions. Moreover, the estimate for the implied proportion of the voting population involved in lobbying activities turns out to be a rather unrealistic 85%. To check the robustness of the results, Goldberg and Maggi (1999) also performed a series of robustness checks by including other explanatory variables commonly used in the literature on the right hand side of the equation. The results obtained in general support the parsimonious specification directly suggested by the theory.

The estimation of the 'protection for sale' model proposed by Gawande and Bandyopadhyay (2000) differs in a few aspects. First of all, the theoretical model is enriched by including an intermediate product y that is used in the production of some or all other final goods, with the exception of the numéraire. Production of the intermediate good requires a sector specific input and it is assumed that the producers in that sector are always able to overcome the free rider problem, becoming organized. The cross-industry pattern of protection is then described by

$$\frac{t_i}{1+t_i} = \frac{I_i - \alpha_L - \alpha_y \, \frac{z_i}{e_i}}{a + \alpha_L + \alpha_y} + \frac{p_y^*}{e_i m_i} \frac{\partial m_y}{\partial p_i} t_y \qquad (14)$$

Here α_y stands for the proportion of the population organized in the intermediate good lobby and t_y is the ad valorem tariff imposed on the imports of the intermediate product y. Also, notice that $\alpha_L + \alpha_y \leq 1$. p_y^* is the international price for the intermediate good y and $\frac{\partial m_y}{\partial p_i}$ is positive because an increase in the domestic price of good i leads to import substitution of good i, and the demand for the intermediate product y actually increases. This implies that protection in industry i is an increasing function of the degree of protection granted to the intermediate product y.

Besides this theoretical contribution, the econometric specification adopted by Gawande and Bandyopadhyay (2000) differs from the one chosen by Goldberg and Maggi (1999) in two respects: on the one hand, the estimated import elasticities here are treated as a fitted regressor; on the other, they follow a different strategy in dealing with the endogeneity of the organizational dummy, highlighting the role of lobbying competition in identifying the reduced form specification of the equation for the organizational dummy. The empirical specification of the tariff equation is

$$\frac{t_i}{1+t_i} = \beta_0 + \beta_1 \frac{z_i}{e_i} + \beta_2 \frac{I_i z_i}{e_i} + \beta_3 t_y + \beta_4 NTB_y + \epsilon_i \qquad (15)$$

where NTB_y is the average non-tariff barrier coverage of intermediate goods used in an industry. The sign predictions consistent with the theory are: (1) $\beta_1 < 0$, (2) $\beta_2 > 0$, (3) $\beta_1 + \beta_2 > 0$ and (4) $\beta_3, \beta_4 > 0$. Data used in this study are slightly more

Table 2. Gawande and Bandyopadhyay (2000)

Variable	Coefficients
z_i/e_i	$\beta_1 = -3.088$ (1.532)
$(I_i z_i)/e_i$	$\beta_2 = 3.145$ (1.575)
t_y	$\beta_3 = 0.780$ (0.242)
NTB_y	$\beta_4 = 0.362$ (0.062)
Constant	$\beta_0 = -0.042$ (0.017)
n	242

disaggregated than in the paper by Goldberg and Maggi (1999): the relevant unit is now a four digit US manufacturing industry, also in this case observed in 1983. A typical set of point estimates is reported in Table 2, where the standard errors are reported in parentheses. The results obtained are again broadly consistent with the theoretical predictions of the model. The individual coefficients have the expected sign, but the restriction $\beta_1 + \beta_2 > 0$ is not supported by the data (the sum of the two coefficients is not statistically different from zero). This implies that the estimated share of the voting population involved in lobbying activities is actually statistically indistinguishable from one, and this is clearly at odds with intuition. On the other hand, the implied estimate for the weight attached by the government to aggregate (gross) welfare a is 3.175, more in line with the previous literature than the $a = 61.5$ estimate obtained by Goldberg and Maggi (1999). This model has also been estimated using Australian data by McCalman (2000), who found support for its predictions.

The estimated weight attached by the government to aggregate welfare appears too big, according to Esfahani (2001), for lobbying activities alone to explain much of the cross sectional variation in protection rates. To address this concern, he suggests to modify the Grossman and Helpman (1994) framework, proposing a second best argument to explain the use of tariffs as a redistributive tool. The idea is that there are sectors of the economy constrained in their access to capital or insurance markets, for which the marginal benefit of protection could potentially outweigh the social cost. This implies that politicians should have a greater incentive to protect firms that are less capital intensive or are intensive in less skilled workers, i.e. those firms that have more difficult access to capital markets or those workers that have more difficulties insuring themselves against income risk. A simple, reduced-form way of modelling this idea is to introduce a variable τ_i that varies across industries and describes the marginal value of a dollar of earnings arising in that industry. The first order condition from the *menu auction* becomes

$$\mu_i \frac{t_i}{p_i^*} = [\frac{(I_i + a)\tau_i}{a + \alpha_L} - 1] \frac{x_i}{m_i} \tag{16}$$

where μ_i is the elasticity of import demands with respect to changes in the foreign price (p_i^*). Notice that if $\tau_i = 1$ for all industries $i = 1, \ldots, n$, then the first order condition reduces to equation (5).[24] The main purpose of Esfahani's exercise is to

test whether τ_i is constant across industries and equal to 1. To this end he estimates the equation

$$\mu_i \frac{t_i}{p_i^*} = \left[\left(1 + \frac{I_i}{a}\right)(\eta' \mathbf{z}_i) - 1\right] \frac{x_i}{m_i} \tag{17}$$

where $\mathbf{z_i}$ is a vector of a constant and explanatory variables like firm scale, capital sales ratio, share of skilled employees etc., that should help explaining the cross industry variation in τ_i. The modified version of the model will outperform Grossman and Helpman (1994) specification if $\eta_j \neq 0$ for at least some j. A typical parameter estimate is reported in Table 3, and it shows indeed that the predictions of the extended model are supported by the data. In particular, it turns out that firm size and the capital-sales ratio and their interaction are all negative and significant, highlighting the potential role of limitations in the access to capital markets as a determinant of protection.

Esfahani (2001) performs a series of robustness checks, all of them lending credibility to the hypothesis that market imperfections can play an additional role, beyond political activity by organized groups, in shaping commercial policy.

Gawande, Krishna, and Robbins (2001) consider an interesting extension of the model to highlight the role of foreign lobbies in shaping domestic trade policy.[25] To that end, they develop a new version of the model, where product markets are modeled as imperfectly competitive using the 'reciprocal dumping' framework introduced by Brander and Krugman (1983), in which competition takes the form of a Cournot duopoly.[26] The equation characterizing trade policy becomes

$$\frac{t_i}{1 + t_i} = \left(\frac{2a}{a + \alpha_L} + \frac{2I_i^H}{a + \alpha_L}\right) \frac{x_i}{m_i e_i} - \frac{2bI_i^F}{a + \alpha_L} \frac{x_i}{e_i m_i} \tag{18}$$

where α_L represents the fraction of the *domestic* population involved in lobbying activities and I_I^F is a dummy variable that takes value 1 if Home's political scene sees foreign lobbyists active in sector i.

In this framework, given the non-competitive nature of the market, a sector should receive positive protection even if it is not organized. If a sector is

Table 3. Esfahani (2001)

Variable	Coefficient
Constant	0.070 (0.0009)
Lobby Indicator	$1/a = 0.0004$ (0.4342)
Constant	$\eta_0 = 0.9993$ (0.0000)
Log(1 + Scale)	$\eta_1 = -0.0815$ (0.0005)
Log(Capital/Sales)	$\eta_2 = -0.0009$ (0.0249)
Log(1 + Scale) $\times$ Log(Capital/Sales)	$\eta_3 = -0.0499$ (0.0004)
n	299

organized, it is expected to receive additional protection, while the presence of domestically active foreign lobbyists should have a negative impact on the amount of protection granted. This by itself is an interesting result. It points against the widespread presumption that the interaction between foreign lobbying and domestic politicians has a deleterious effect on the home economy. In this framework, foreign lobbying actually *improves* consumers' welfare! Rearranging terms in equation (18), the estimating equation can be written as

$$\frac{t_i}{1 + t_i} = \beta_1 \frac{x_i}{m_i e_i} + \beta_2 \frac{I_i^H x_i}{m_i e_i} + \beta_3 \frac{I_i^F x_i}{m_i e_i} + \epsilon_i \qquad (19)$$

The signs consistent with the theory are $\beta_1 > 0$, $\beta_2 > 0$ and $\beta_3 < 0$.[27] While lobbying by foreign corporations has been prohibited in the United States since the passage of the *Foreign Agents Registration Act* of 1938, the same legislative measure allows US subsidiaries of foreign corporations and registered US nationals to make contributions to US political action committees *on behalf* of foreign corporations, provided that they are not made with monies originating from the foreign entities. Contributions are recorded by the Department of Justice, and these files are used by Gawande, Krishna, and Robbins (2001) to construct the dummy variable capturing foreign lobbying activities. The time frame considered is 1978–1982, and in this case the measure of protection used is the tariff rate. A typical point estimate is reproduced in Table 4, where the t statistics are reported in brackets.[28] The results reported in Table 4 provide broad support for the predictions of the model. In particular, according to the estimates, domestic lobbying is correlated with an increase in tariffs, while foreign lobbying reduces them. In the words of Gawande, Krishna, and Robbins (2001) '...Foreign lobbying thus improves US welfare (thus acting as a substitute of sorts for US consumer lobbies)'. Notice though that the third prediction of the model, that without lobbying from any source a welfare maximizing government should still impose a tariff, finds only weak support in the data.

4. Factor mobility

In the previous section we have surveyed the most recent developments in the large and distinguished literature on the political economy of trade policy. When we turn to factor movements, studies that have addressed the politics of

Table 4. Gawande, Krishna and Robbins (2001)

Variable	Coefficients
$x_i/(m_i e_i)$	$\beta_1 = 0.007 \ (1.703)$
$(I_i^H x_i)/(m_i e_i)$	$\beta_2 = 0.256 \ (2.222)$
$(I_i^F x_i)/(m_i e_i)$	$\beta_3 = -0.198 \ (1.87)$
n	248

distortions are sparse and have only tackled particular aspects. Several papers have addressed the political economy of migration, and a few have looked at the political economy of distortions in international capital flows. To the best of our knowledge, a unified framework in which organized factors lobby for protection has been proposed only recently by Facchini and Willmann (2001b). Furthermore, traditionally the literature on the political economy of international trade has focused its attention on tariffs and quotas as – the often unique – instruments of income redistribution to preferred groups. The existing studies on the political economy of factor mobility have instead looked at the effects of factor movements on pre-existing redistribution schemes.

Having said that, we proceed first by discussing issues related to labor movements, then we review papers that have looked at the political economy of foreign direct investment distortions.

4.1 *Labor movements*

In this section, instead of providing an exhaustive review of the literature on the political economy of immigration policy, we are going to discuss a few selected papers that highlight the important aspects of the debate. The first two papers we review offer a theory of the political economy of migration in the absence of a pre-existing welfare state. They naturally provide a simplified view of the issues at stake, but enable us to highlight the important role played by complementarities between immigrant labor and domestic factors in shaping the policy outcome. We will then consider two recent papers by Razin, Sadka, and Swagell (2000) and Razin and Sadka (1999), where the political economy of immigration is modeled in relation to an explicit intragenerational and intergenerational redistribution system. Finally, we will briefly discuss a paper by Scholten and Thum (1996) that looks at the same question from a slightly different point of view.

Foreman-Peck (1992) developed one of the first models of the political economy of migration. The government of a destination country chooses a migration policy to maximize a weighted sum of domestic factor rewards, subject to the technological constraint described by an aggregate production function. Since Foreman-Peck (1992) was particularly interested in studying immigration to the United States during the century 1815–1914, he highlighted the role of the interests of landowners. Normalizing output prices to 1, let w_1 be the wage rate of domestic workers, π the rate of return on capital, and r the rate of return on land. Then let L_1 be the domestic labor supply, L_2 immigrant labor supply, T land, and K the domestic stock of capital. The problem faced by the government is then

$$\max_{L_2} V = \alpha w_1 + \beta \pi + (1 - \alpha - \beta) r$$
$$\text{s.t. } Q = f(L_1, L_2, T, K)$$

Notice the absence from government's objective function of foreign factor rewards. This is a recurring theme in the literature on the political economy of

migration, and is a reasonable assumption in a short-term political economy perspective.

Assuming that factors are paid the value of their marginal product, the relevant first-order condition for the optimal choice of L_2 is

$$\alpha f_{L_1 L_2} + \beta f_{KL_2} + (1 - \alpha - \beta) f_{TL_2} = f_{L_2} \qquad (20)$$

The equilibrium policy is attained when the marginal product of immigrant labor is a suitably weighted average of the marginal effect of immigrant labor on domestic factor prices, where the weights come directly from the government's presumed objective.

Notice the role of complementarities between different inputs. If domestic and foreign labor are *net* substitutes, the more sympathetic to domestic labor is the government (in other words, the higher α), the less open immigration policies are going to be. On the other hand, if land and foreign labor are *net* complements, the more weight the government attaches to land's interest, the more open these policies are going to be. A similar argument applies for the case of capital. This framework is very simple. The 'political economy' component is a stripped down influence function, but the role of complementarities between domestic factors and foreign labor is appropriately highlighted.

Benhabib (1996) looks at a similar question. In particular, the problem he addresses is how migratory policies that impose both capital and skill requirements would be determined under majority voting, when the objective of the natives is income maximization. Individuals are characterized by the amount k of total (physical and human) capital they own, where k is assumed to be a continuous variable with density $N(k)$ defined over an interval $[0, \infty)$. The initial capital stock is $K_0 = \int_0^\infty N(k) k \, dk$, while the initial population size is $L_0 = \int_0^\infty N(k) dk$. Also, the median capital stock k_m solves the equation $\frac{\int_0^{k_m} N(k) dk}{L_0} = 0.5$. The potential immigrants are characterized by a density $I(k)$, also defined over $[0, +\infty]$. An immigration policy $P[s, q]$ restricts the immigrants' values of k to the interval $[s, q]$. Then the post immigration capital–labor ratio is given by

$$R(s, q) = \frac{K_0 + \int_s^q I(k) k \, dk}{L_0 + \int_s^q I(k) dk} \qquad (21)$$

The technology available in the economy is characterized by a strictly concave production function $F(K, L)$ that exhibits constant returns to scale. Define $f(R) = F(R, 1)$, which is the output–labor ratio when R is the capital–labor ratio. Denote by $R(0, \bar{q}) = \underline{R}$ the minimum domestic capital-labor ratio obtainable through immigration, where $\bar{q}$ is the highest q such that $R(0, q) = q$. Also, let $R(\underline{s}, \infty) = \bar{R}$ be the maximum value of the domestic capital–labor ratio obtainable by setting a migration policy, where $\underline{s}$ is the minimum value of s for which

$R(s, \infty) = s$. The immigration policy favored by an arbitrary type k_a is then the solution to the problem

$$\max_{R \in [\underline{R}, \overline{R}]} f(R) - f'(R)R + f'(R)k_a \qquad (22)$$

The objective function is quasi convex, and it is minimized at $k_a = R$. In other words, type k_a will choose either $\underline{R}$ or $\overline{R}$. Let k_I be the type that is indifferent between $\underline{R}$ and $\overline{R}$. Then, if the median voter is characterized by $k_m < k_I$, $(k_m > k_I)$, the policy $P(\underline{s}, \infty)$ $(P(0, \bar{q}))$ defeats all other immigration policies under majority voting.

The main message of this very elegant construct is again that the median voter will choose immigrants with skill profiles that are complementary with its own. Obviously, taking literally the implications of the model, there might be difficulties in enforcing a policy that imposes an upper limit ($\bar{q}$) to the skill level of an immigrant!

The impact of unskilled immigrants on the welfare system has been the object of an active debate, especially in the United States – see Borjas (1999). In a recent study, Razin, Sadka, and Swagell (2000) consider the extent to which unskilled immigration will affect the amount of redistribution taking place in the host country. The interesting result is that, against conventional wisdom, an influx of unskilled immigrants can actually *reduce* the extent of domestic redistribution. To understand the argument better, let's take a closer look at the model.

The inhabitants of the host country are endowed with K units of capital, and are individually characterized by a parameter e describing their innate ability. Let e be a continuous variable with uniform density over the interval [0, 1]. Furthermore, normalize the size of the domestic population to 1. Agents live only one period and at the beginning of their lives, they face an educational choice. They can either spend a fraction e of their time acquiring skill and then supply 1 unit of labor, or they can decide to remain unskilled, work for their entire life and supply $q < 1$ units of labor. The government implements a redistribution mechanism that takes the form of a linear income tax (τ) accompanied by a uniform lump sum rebate b. Acquiring skill has a pecuniary cost γ. If w is the wage per efficiency unit of labor, the minimum skill needed to make a schooling decision attractive is given by

$$e^* = 1 - q - \frac{\gamma}{(1-\tau)w} \qquad (23)$$

Agents characterized by $e < e^*$ will invest in education, while agents with ability $e > e^*$ will remain unskilled. The number of immigrants m is exogenously given (the result of a quota), and the aggregate labor supply amounts to

$$L = e^* - \frac{1}{2}(e^*)^2 + (1 - e^* + m)q \qquad (24)$$

since it is assumed that all immigrants supply unskilled labor. The production function is assumed to be linear, so $Y = wL + (1+r)K$. Immigrants are fully entitled to the grant b and a balanced budget requirement determines the amount of the rebate, fixing it at

$$b = \frac{\tau(wL + rK)}{1 + m} \qquad (25)$$

For any tax rate τ, equations (23), (24) and (25) jointly determine $e^*(\tau, m)$, $L^*(\tau, m)$ and $b^*(\tau, m)$. Let $c(e, \tau, m)$ be the disposable income[29] available to an agent of innate ability e. Razin, Sadka, and Swagell (2000) show that $\partial^2 c / \partial e \partial \tau \geq 0$. In other words, $\partial c / \partial \tau$ is monotonic in the parameter e describing innate ability. This means that the tax policy will be chosen by the median voter – the voter with the median level of inherent ability. Having normalized the size of the domestic population to 1, and recalling that ability is uniformly distributed, if immigrants are allowed the right to vote, the median voter is given by $e_M = \frac{1}{2}(1+m)$. The income tax chosen by the median voter is then determined as

$$\tau_0(m) = \arg\max_{\tau} c(e_M(m), \tau, m) \qquad (26)$$

The corresponding first-order condition determines $\tau_0(m)$ as the solution of the equation $B(m, \tau(m)) = 0$. Totally differentiating this relation, we obtain

$$\frac{d\tau_0}{dm} = -\frac{B_m}{B_\tau} \qquad (27)$$

where B_i ($i = m, \tau$) denotes the relevant partial derivative of the implicit function. The second-order condition for optimality guarantees that $B_\tau < 0$, so the sign of $d\tau_0/dm$ depends only on B_m. Razin, Sadka, and Swagell (2000) show that

$$B_m(m, \tau_0(m)) = \begin{cases} \frac{w(q+m)}{1+m} - \frac{rK}{1+m} & \text{if } e_M < e^* \\ -\frac{rK}{1+m} & \text{if } 1 > e_M > e^* \\ 0 & \text{if } e_M > 1 \end{cases}$$

In other words, if the median voter is an unskilled native, an increase in the number of immigrants unambiguously *lowers* the equilibrium tax rate and demogrant. This is an interesting result and goes against common wisdom, since the majority of the voters are unskilled and therefore pro-tax. The issue is that an inflow of unskilled immigrants will not change the power balance. At the same time, the native median voter would lose at the margin because he would see part of the demogrant leaking to the immigrants, whose numbers have increased.

Notice also that in the case in which the median voter is a skilled domestic worker, the effect of an increase in immigration on the politically determined tax rate is ambiguous.

In a related paper Razin and Sadka (1999) investigate the political economy of immigration in the presence of a *pay as you go* social security system. Also in this case, a rather interesting and counterintuitive result emerges: although immigrants may be low skilled and net beneficiaries of the pension system, all domestic age and skill groups living at the time of their arrival are made better off by their presence. Furthermore, today's inflow of immigrants will not have a negative impact on the welfare of future generations. This is a very relevant conclusion and supports the view of those who see a more open migration policy as a possible measure to counterbalance the effects of population aging. Let's take a closer look at the argument.

Consider a world with overlapping generations. Each generation lives for two periods, and let's normalize the size of the cohort born in the first period to one. In the first period the domestic agents face the same skill acquisition decision discussed in Razin, Sadka, and Swagell (2000), with the difference that now there is no pecuniary cost associated to schooling. With this simplification, the expression for the ability threshold above which the domestic agent will not become skilled is

$$e^* = 1 - q \tag{28}$$

Furthermore, every agent gives birth to $(1 + n)$ children, consumes an all-purpose good, and saves for retirement. In the second period, the agent does not work and lives off her savings and a pension funded through a pay as you go social security system. A social security tax τ is levied on the income of the young, and the revenues are rebated as a pension to the current old in the form of a demogant. The intertemporal budget constraint of an individual of ability e born in period zero is therefore

$$c_1 + \frac{c_2}{1+r} = W(e)(1-\tau) + \frac{b_1}{1+r} \tag{29}$$

where $W(e) = w(1 - e)$ if the agent invests in skill acquisition, and $W(e) = wq$ if the agent decides not to attend school. Let $V_1^e(W(e)(1-\tau), b_1, r)$ be the indirect utility of the current young. Notice that V_1^e is strictly increasing in b_1. In period zero there are also $\frac{1}{1+n}$ old. Their welfare depends only on the pension they receive and the current rate of return on capital (since their savings were determined in the previous period). Denote their indirect utility by $V_0^e(b_0, r)$. Also, in this case, V_0^e is strictly increasing in b_0.

Suppose that an exogenously given number m of unskilled immigrants arrive in period zero. They follow the same reproductive pattern that characterizes the domestic population and their offspring fully assimilate in the next period. The

assumption that the skill distribution is uniform over the interval [0, 1] implies that total labor supply in period zero[30] is

$$L_0 = e^* - \frac{1}{2}(e^*)^2 + (1 - e^* + m)q \qquad (30)$$

while the aggregate labor supply in period one is given by

$$L_1 = (1 + m)(1 + n)[e^* - \frac{1}{2}(e^*)^2 + (1 - e^*)q] \qquad (31)$$

The production structure is again modeled as in Razin, Sadka, and Swagell (2000), with a linear technology. In other words, we are still looking at a small country with free access to international capital markets.

Consider the impact of unskilled immigration on the social security system, which is assumed to be fully balanced period by period. Given a payroll tax rate τ, the demogrant paid in the period zero is

$$b_0 = (1 + n)\tau w(e^* - \frac{1}{2}(e^*)^2 + (1 - e^* + m)q) \qquad (32)$$

Notice that b_0 is strictly increasing with the number of immigrants. In other words, the old generation in period zero is unambiguously made better off by an inflow of unskilled immigrants. The demogrant in period one, on the other hand, is

$$b_1 = \tau w(1 + n)[e^* - \frac{1}{2}(e^*)^2 + (1 - e^*)q] \qquad (33)$$

Inspecting equation (33) we can immediately notice that the inflow of immigrants at period zero does not have an impact on the pension payments collected by the old in period one. Furthermore, the assumption of perfect capital mobility makes the dynamic of this model very simple: all the adjustment takes place in one period, and since the demographic characteristics of the immigrants and native born are stationary, the demogrant for future generations is going to be equal to b_1. To sum up, the current old are net beneficiaries from unskilled immigration, while the current young and all future generations are going to be indifferent. Therefore, we should expect that an open migration policy should actually be supported as a political equilibrium.

Scholten and Thum (1996) ask a very similar question, this time in an over-lapping generation framework in which each cohort lives for three periods. In the first two periods of their lives, which for the sake of convenience we call youth and maturity, agents work. In the third period they retire and live off their savings and a pension. The pension received by an old agent in this case is modeled as a fixed percentage of the current wage, as is the case for many western European

countries. Furthermore, the capital account is assumed completely closed, and therefore immigration will unambiguously reduce the prevailing wage rate. This creates opposing interests between the young on one hand and the mature and old workers on the other. While the young view migration with a positive eye because it reduces the social security burden they face over their lifetime, the mature (and *a fortiori* the old) workers have a more skeptical attitude, since the influx of immigrants will reduce the prevailing wage, and will thus reduce their income when retired. At the same time, the benefit they receive from spreading out the social security burden is going to be only very limited.[31] In an equilibrium where policy is determined by majority voting, the size of the immigration quota will depend on the relative sizes of the three cohorts. Scholten and Thum (1996) show that in general the amount of immigration chosen by the median voter is not optimal, because intergenerational externalities are not properly taken into account.

While the assumption of perfect capital mobility made by Razin and Sadka (1999) might be a bit extreme, it is probably closer to the reality of modern developed countries than the closed capital account assumed by Scholten and Thum (1996). What this last model rightly highlights, on the other hand, is the need to incorporate a richer age profile to understand the determination of migration policy in the presence of a social security system.

4.2 *Foreign Direct Investment*

The fierce competition between countries for Foreign Direct Investment (FDI) has been extensively documented by Oman (2000). Nevertheless, only very few studies have looked at the political economy of distortions to foreign direct investment flows. In this section we will take first a closer look at the median voter model developed by Schulze (2000). We will the consider an interesting paper by Haaparanta (1997), which considers a model in which countries compete for FDI, and at a paper by Biglaiser and Mezzetti (1997) in which politicians use subsidies to foreign direct investment to signal their ability to provide a public service. Neither of the three papers takes into account the role of organized factors in shaping the policy outcome. This important aspect is the focus of the recent contribution by Facchini and Willmann (2001b), which we will discuss next.

Schulze (2000) considers a model similar to Benhabib (1996), in which a small country has to decide whether to limit the outflow of capital. Also in this case, the domestic economy produces a single commodity using capital and labor, according to a constant returns to scale technology. Every domestic national owns a positive amount of labor and a non-negative amount of capital. Labor is assumed to be internationally immobile, while capital can move across borders. The intervention instrument available to the domestic government is a tax on the returns to capital accrued abroad, which are assumed to be repatriated. The revenues arising from the implementation of the tax are then rebated according to the share of each individual in income deriving from factor ownership. Individuals

vote on the optimal tax rate, and it is easy to show that capital controls will be implemented if the median voter is characterized by a less than average capital endowment. In other words, capital controls will be present, provided that the distribution of the stock of capital in the population is skewed to the right.

This simple model, in which labor is unrealistically assumed to be completely immobile across countries, once more highlights the role of complementarities between factors in shaping policy.

The model developed by Biglaiser and Mezzetti (1997), looks at another type of distortion in the international flow of capital. In this case, the focus is on FDI subsidization, interpreted as a device in the hands of an elected politician to signal his ability to provide public services. The starting point is that the politician has control over a staff that can provide a public input to a project (for instance, a new bureaucratic structure, free site development for a new manufacturing plant, etc.). The quality of this input is unknown to the voters. Given the signaling value of the project, a politician concerned with reelection prospects will attach a value to the project that is higher than its actual economic value to the constituency. Of course, this is going to be *a fortiori* true if the politician's motivations are less noble.

In a two-period model, Biglaiser and Mezzetti (1997) show that if the politician has a low subjective probability of being reelected (i.e., if the *incumbency bias* is negative), he will tend to undertake more projects than optimal (i.e. to subsidize more foreign direct investment) in order to have more opportunities to signal his ability to provide public services. If, on the other hand, he expects to win the election, he will have an incentive to start a less than optimal number of projects. The intuition in this case is that, being confident of his electoral prospects, the politician does not want to incur the risk of hitting a bad draw in providing the public service.

This is potentially an interesting explanation for the observed distortions in the type of FDI projects undertaken, and the magnitude of the subsidies deployed. Naturally, this model finds applications beyond foreign direct investment subsidization and offers a set of interesting empirical predictions. One important limitation of this framework is that citizen–voters are assumed to be completely homogeneous: there is no room for conflicting interests. This seems a particularly restrictive assumption in a political economy model.

The two papers we have just reviewed look at distortions in capital flows from the point of view of a single country. Haaparanta (1997) instead models competition for FDI between countries, using the familiar common agency setting. Here, the common agent is a multinational corporation, that has to decide whether to set up shop in country H or F. The two countries act as principals in trying to attract the multinational by offering it a subsidy schedule $s_i(K_i)$ that depends on the amount K_i of capital invested. The objective function of each country's government is very simple. Haaparanta assumes that domestic citizens' welfare is measured only by wage income from FDI. In other words, the model does not take into account the impact of FDI on the domestic rate of return on capital, and the possibility that domestic capital might indeed be hurt by FDI

inflows. The objective of each government is the maximization of *net* domestic welfare, i.e.

$$\omega_i = w_i L_i(K_i, w_i, M_i) - s_i(K_i) \quad i = H, F \tag{34}$$

where w_i is the domestic wage, L_i is domestic labor supply, and M_i is domestic 'market size'.[32] The multinational enterprise, on the other hand, maximizes profits π given by

$$\pi = \sum_i \pi_i = \sum_i [R_i(Q_i, M_i) - w_i L_i + s_i(K_i)] - rK \tag{35}$$

where $R_i(Q_i, M_i)$ are total revenues in country i, whereas r is the opportunity cost of the investment, and $K = K_H + K_F$ is the (given) total investment. Focusing only on globally truthful schedules and interior solutions, Haaparanta (1997) shows that the investment allocation decision is determined by the first-order condition

$$\frac{\partial \pi_H}{\partial K_H} + w_H \frac{\partial L_H}{\partial K_H} = \frac{\partial \pi_F}{\partial K_F} + w_F \frac{\partial L_F}{\partial K_F} \tag{36}$$

In other words, the flow of FDI to country H increases with w_H if $\partial^2 L_H / \partial w_H \partial K_H > 0$. This implies that a country can increase its share of foreign direct investment even if its 'competitiveness' in terms of production costs deteriorates. Similarly, a country in a disadvantageous initial position can increase her share of FDI even if the other country uses subsidies that are optimal from her point of view.

Although this model does not focus on domestic political economy, it emphasizes how competition for foreign direct investment can potentially generate highly inefficient outcomes. This argument lends support to those advocating a ban of the use uncoordinated, nationalistic fiscal measures aimed at attracting foreign capital.

4.3 The political economy of international factor mobility

The literature reviewed so far has focused on rather narrowly defined questions, and has not provided a general theory of the political economy of international factor mobility. In a recent paper, Facchini and Willmann (2001b) have attempted to fill this gap.

There exists substantial evidence concerning the role played by organized interests in shaping policy toward factor mobility. Traditionally, US unions have been fierce adversaries of open migratory policies. At the same time, they have supported foreign direct investment as a tool to create new, well paid jobs for their members.[33] The role of Silicon Valley entrepreneurs in the recent debate on the H1B visa is an example of the importance of organized capital's lobbying activities in shaping migration policy, and the list could go on. These episodes

highlight both the role of organized factors, and the importance of complementarities between factors in shaping policy.

Starting from this observation, Facchini and Willmann (2001b) model the formation of policy towards factor mobility for a small country using the familiar *menu auction* framework. Organized factors lobby for protection and the domestic government is the common agent choosing policy. In a single commodity–multiple factors setting, each lobby maximizes its members' net welfare (income), defined as

$$n_i = g_i - B_i(\mathbf{w}) = w_i \ell_i + \alpha_i(\pi(\mathbf{w}) + r(\mathbf{w})) - B_i(\mathbf{w}) \tag{37}$$

where w_i is the domestic reward for factor i, ℓ_i is the group's supply of factor i, α_i is the share of the population supplying factor i, π are profits, $r(\mathbf{w})$ are tariff revenues and $B_i(\mathbf{w})$ are contributions paid to the government. The government maximizes the familiar aggregate welfare function defined in (4). In this setting, protection can either take the form of a tariff (subsidy) on foreign factor flows, or of a quantitative restriction. Provided that the government is able to capture quota revenues, Facchini and Willmann (2001b) show indeed that there exists strategic equivalence between tariffs and quotas. Considering the case of a tariff, equilibrium policy is determined as

$$w_j - w_j^* = -\frac{1}{a + \alpha_\Lambda} \sum_{i \in I} F_{ji}(I_i - \alpha_\Lambda)\ell_i \quad \forall j \in I. \tag{38}$$

where w_j^* is the international rate of return on factor j, I_i is the organizational dummy and F_{ij} is the second derivative of the production function. Equation (38) highlights the role both of organization and of complementarities between factors. Consider the case of factor i and j, and let's assume that both are organized and that they are complements in production ($F_{ij} > 0$). Then, the presence of a lobbying complement will have a negative impact on the degree of protection granted to factor i. The intuition is that naturally a factor will have the incentive to lobby for the removal of any distortion in the flows of its complements, since its marginal productivity is increasing in the quantity available of that factor. The role of the other variables entering equation (38) should by now be familiar.

Facchini and Willmann (2001b) performed then a simple test of the model. Their specification is a modified version of (38),

$$t_j = \psi \left(\sum_i \frac{F_{ij}}{w_j} I_i \ell_i \right) + \gamma \left(\sum_i \frac{F_{ij}}{w_j} \ell_i \right) + \epsilon_j \tag{39}$$

where $\psi = -\frac{1}{a + \alpha_\Lambda}$ and $\gamma = \frac{\alpha_\Lambda}{a + \alpha_\Lambda}$. The sign restrictions consistent with the theory are $\psi < 0$, $\gamma > 0$, $\gamma - \psi > 0$. The data set used is a cross section of OECD countries, measured in 1995.[34] The results obtained are pretty encouraging and are reported in Table 5.

Table 5. Facchini and Willmann (2001)

Coefficient	Tariff (USD)
γ	0.001403 (0.000085)
ψ	-0.01063 (0.00063)
α_Λ	0.1316 (0.00072)
a	93.8 (5.624)
n	93

The reduced form coefficients have the expected sign and the implied estimates of the structural parameters of the model highlight how, also in this context, the government appears to be welfare minded, even if contributions are actually influencing policy.

5. Conclusions

In this paper we have reviewed some of the recent explanations offered in the literature for the distortions observed in the international flow of goods and production factors. While the two are clearly related phenomena, as they both aim at protecting domestic factor rewards, the two are far from being substitutes, apart from a very limited set of circumstances. A ranking of the instruments from the point of view of domestic welfare has been attempted, but the results obtained are partial and not completely satisfactory.

In turning our attention more specifically to the distortions which arise in international trade, we have noticed the emergence of a paradigm, in which trade policy is modelled as the result of *influence driven* contributions by organized groups. Although this framework faces some theoretical challenges, it has found strong and robust evidence in the empirical tests performed so far, conducted using both US and international data.

Concerning factor mobility, the literature appears much less mature. Most of the studies reviewed deal with narrowly defined questions, focusing either on migration or on the flow of foreign direct investment. Migratory policies have often been studied in relation to an existing welfare state, and particular attention has been given in the literature to the possible benefits connected to a large inflow of a young cohort of foreigners in an aging society. Studies on the political economy of capital controls have highlighted the role of complementarities between factors in shaping FDI policy and the potentially large distortions introduced by massive subsidization to fend off international competition.

Only very recently a model has been proposed, in which policy towards factor mobility is the result of active lobbying by different groups, and in which the interaction between political activity and complementarities between factors has been appropriately highlighted.

Several questions remain open. As we have seen, little is known about ranking of protectionist policies, both from a normative perspective as well as from the

point of view of the political viability of the different instruments. Having a model that examines the formation of policies towards both trade in goods and factor movements would help us answer that question. Another important issue is the interaction between domestic politics and international negotiations over the liberalization of factor flows. This is a particularly important question if we aim at understanding, for instance, the evolution of the European Economic Community from a Free Trade Area to a Union, where factors are free to circulate. A better understanding of this issue will allow us to shed some light or possible future developments. For instance, will NAFTA ever become a North American Union, in which factors are freely mobile from Yucatan to Alaska?

Acknowledgements

Notes

1. See Facchini and Willmann (2001a) for a recent survey of the literature.
2. Of course, there are several circumstances in which this holds true also for the country of emigration. Many countries have actually implemented policies aimed at actively promoting emigration flows, as in the case of Korea.
3. For a more detailed discussion we refer the reader to the well-known paper by Markusen (1983).
4. See Dixit and Norman (1980), chapter 4, and for more recent discussions, Deardorff (1994) and Xiang (2001).
5. For a more detailed discussion, we refer the reader to Wong (1983), page 234. Notice also that a comparison of free factor mobility versus free trade in final goods is also possible, but Wong (1983) does not discuss this aspect for similar reasons.
6. In this case, labor.
7. Capital in this case.
8. For which we refer the reader to the excellent papers by Helpman (1997) and Rodrik (1994).
9. The data are available online at http://www.fec.gov/press/pacye98.htm.
10. For a first attempt to endogenize the formation of lobbies in this context, see Mitra (1999).
11. In adopting this specification, we follow Grossman and Helpman (1994). It is easy to see that this welfare function is equivalent to $\overline{G} = \beta \sum_{i=0}^{n} V_i(\mathbf{p}) + (1 - \beta) \sum_{i \in L} B_i(\mathbf{p})$, where $\beta = \frac{a}{1+a}$.
12. For this reason, Grossman and Helpman (2001), page 226, renamed these schedules 'compensating' contribution schedules.
13. This strong result is the direct consequence of the sector specific input assumption. If we were to allow a richer production structure, with multiple mobile factors, this result would not generally hold.

14. For a critical discussion of this implication of the model, see Maggi and Rodriguez-Clare (2000).
15. This is the situation described by Grossman and Helpman (1995) as a 'trade war'.
16. For a more detailed discussion, see Grossman and Helpman (1995), page 689.
17. See Grossman and Helpman (1995) for a discussion of the other possible cases.
18. See Bhagwati, Panagariya, and Srinivasan (1998) page 289 for a textbook treatment.
19. For more details, see Grossman and Helpman (1995), page 693.
20. One of the few important exceptions is of course the so called *intervention buying* mechanism in the common agricultural policy implemented by the European Union, that effectively functions as an export subsidy.
21. We will discuss shortly the specification chosen by Gawande and Bandyopadhyay (2000), where instead the elasticity is treated as a fitted regressor and kept on the right-hand side of the estimating equation.
22. Explicit tariff rates are indeed the result of multilateral negotiations, and are less likely to be directly influenced by lobbying activities.
23. Trefler (1993) had successfully used a similar measure before.
24. The only difference being the way the import elasticity is computed.
25. Already Grossman and Helpman (1995), in footnote 10, page 689, consider the role of foreign lobbies in their two-country, perfectly competitive setting.
26. Fung and Lin (2000) have also looked at trade policy determination in a non-competitive framework, but their starting point is the Brander and Spencer (1984) model.
27. Of course, as in the previous cases, one should look also at the corresponding joint restrictions.
28. This is column 3 of table IIIA in Gawande, Krishna, and Robbins (2001).
29. In this one–good world, disposable income describes the agent's welfare.
30. Razin and Sadka (1999) actually reach the same conclusion with a more general density function.
31. Actually, there is no benefit to the old.
32. In other words, Haaparanta assumes that markets for products manufactured in different countries are segmented, and that the dimension of the domestic market matters.
33. The proposed takeover of Voicestream by Deutsche Telekom is an interesting example. In his statement in front of congress the president of the Communications Workers of America Morton Bahr stresses how 'In the telecommunication industry, the presence of Deutsche Telekom in our market place could yield some substantial benefits to workers and consumers'. The full statement is available at http://com-notes.hous.gov/ccchear/hearings106.nsf.
34. We refer the reader to the original paper for more details.

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