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FISCAL POLICY AND EUROPEAN INTEGRATION

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ABSTRACT

The internal market in Europe will greatly increase the international mobility of resources. How will this affect fiscal policy in different countries? The first part of the paper considers taxation of capital in a two country model, where a democratically chosen government in each country chooses tax policy. Higher capital mobility changes the politico-economic equilibrium in two ways. On the one hand, it leads to more tax competition between the countries: this "economic effect" tends to lower both countries' tax rates. On the other hand, it alters voters' preferences and make them elect a different government: this "political effect" offsets the increased tax competition, although not completely so. The second part of the paper considers taxation of labor, in a model where labor is internationally immobile. Eliminating the remaining barriers to trade in goods, changes the distribution of labor earnings in the economy, which again has a political, as well as an economic effect. And again the economic and political effects push the tax rates in different directions, but here the political effect can prevail. The tendency for an adapting political equilibrium to preserve the status quo, thus emerges as a general result of the paper.

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## 1. Introduction

The creation of an internal European market in the 90's will integrate the individual national markets by taking away existing national regulations, technical standards, border controls, and special rules for foreign competitors. This will remove most of the remaining barriers to the mobility of capital, goods and labor. How will increased mobility affect fiscal policy in different countries? Will the distribution of the overall tax burden across different tax bases change? And if so, how? What will happen to government transfer payments and government expenditure on goods and services? Will tax and spending policies of different countries converge or diverge?

A great deal of the policy discussion has centered on the questions of fiscal policy harmonization and coordination (see in particular the Delors report). Explicitly or implicitly these questions suggest a cooperative approach to policymaking. We believe that such an approach is unrealistic at the present stage of European integration. The present cooperation in deciding on some general rules is one thing, but prospective cooperation in deciding on specific policies is something completely different.

We prefer to think of each country in Europe as deciding noncooperatively about its fiscal policy. Furthermore, we prefer to think of the policy decision process as a politico-economic equilibrium that reflects the particular economic and political characteristics of each country. When the environment changes—as when resources in Europe become more mobile—so will the politico-economic equilibrium that determines fiscal policy. In general terms, the approach we have just outlined can be described as "positive public finance." In the literature there are certainly a few examples of researchers that have adopted such an approach, particularly in local public finance, but it is surprising that public finance economists have done so little work in this direction. This paper can therefore be seen as a particular example of a more general research agenda that attempts to explain the large differences in the fiscal policies of different countries by

differences in their economic and political structure.<sup>1</sup>

Let us turn to the specific issues addressed in this paper. We shall try to highlight two implications of reducing the barriers to mobility. The first has to do with some tax bases becoming more mobile across borders. In principle this applies to the taxation of most tax bases: capital, goods and labor. In practice, however, the most important case is that of capital. Higher capital mobility raises the issue of tax competition between countries, an issue that has been treated in the literature by Gordon (1983) and many others. This literature discusses the externalities in taxation when tax bases can move across borders, and the possibility of non-cooperative equilibria with suboptimally low levels of taxation. Indeed, it is these externalities that have provoked discussions about the need to harmonize capital taxation within the European community (see for instance, Giovannini (1989) and Giovannini and Hines (1990)).

In Sections 2 and 3 of the paper we analyze this issue in a simple, two-country, two-period model. In each country distorting taxes on capital are raised to finance government transfer payments. Wealth is distributed unequally across the population, so there is scope for a political equilibrium with positive taxes and redistribution, essentially as in the classical paper by Meltzer and Richards (1981). The population votes to appoint a policymaker (a government) who then sets capital taxes, taking into account capital taxes in the other country. The individual with the median endowment casts the pivotal vote, but, interestingly enough, chooses to appoint a policymaker with policy preferences different from his own. This delegation turns out to correct some of the distortions that arise from tax competition.

We show that this political mechanism offsets the economic consequences of higher capital mobility on the tax rate. With the same policymaker in place, higher capital mobility reduces capital taxation and government transfer payments. But since the

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<sup>1</sup> Persson and Tabellini (1990) discuss and survey the small but growing literature that tries to develop a positive theory of fiscal policy.

majority will appoint a new policymaker further "to the left," the reduction in capital taxation is mitigated. We also discuss how initial asymmetries in capital taxation across countries that derive from different distributions of wealth affect the policy response to higher capital mobility.

We then consider a second implication of the 1992 integration, which is more relevant for the taxation of factors that are less mobile internationally. Whatever the aggregate effects of 1992, the integration is likely to have large sectoral effects by removing many of the remaining obstacles to trade in goods and services among the European countries. Profitability and factor rewards will rise in some sectors and fall in others. In response, resources will move across sectors. These sectoral changes will create incentives to change existing policies and they will alter the political majorities that support them.

In Sections 4 and 5 we illustrate these ideas in a simple, two-sector model of a single economy. There is only one tax base—labor—employed both in the export sector and in the import-competing sector. Workers are heterogeneous in two respects: they have different (effective) labor endowments, and they receive a different average wage in the two sectors. As in the previous model, individuals vote to appoint a policymaker who in turn imposes distorting taxes and distributes the proceeds across the population.

Here, it is not in the median voter's interest to appoint a policymaker with different policy preferences from his own. Instead, the identity of the median voter is endogenous and depends on the economy's structure—on the sectoral shares and the relative wage, for example. Reducing the protection of the importing-competing sector by removing trade barriers changes the incentives for redistribution because it alters the relative wage. This triggers a change in the tax rate, the direction of which depends on the initial structure: If the import-competing sector enjoys a wage premium, this premium shrinks and the labor tax tends to fall. But if the protected sector has lower wages, the tax tends to rise.

Interestingly, the endogenous change in the winning political majority tends to

counteract the effects on equilibrium policy—relative to what would have happened with the same majority in place—precisely as it does in the capital taxation model. This tendency for the change in the political equilibrium to preserve the *status quo* thus emerges as a general result of our paper.

## 2. Capital Taxation

This section illustrates how higher capital mobility leads to increased tax competition and to generally lower tax rates on capital. We focus on the international allocation of productive capital (as opposed to financial capital) within Europe. Consequently, our results apply to corporate taxation more than to other forms of capital taxation.

### 2.1 The Model

We study a two-period and two-country model adapted from Persson and Tabellini (1989). Both countries produce the same commodity, and both have access to a linear storage technology with gross return equal to unity. The two countries are inhabited by individuals with the same preferences but heterogeneous endowments. Here we describe only the domestic country. The description of the foreign country is completely analogous. The  $i^{\text{th}}$  individual maximizes:

$$(2.1) \quad W^i \equiv U(c^i) + d^i,$$

where  $U(\cdot)$  is a well-behaved utility function, and  $c$  and  $d$  denote consumption in the first and second period, respectively.

In the first period, the  $i^{\text{th}}$  individual receives an endowment  $1 + e^i$ , and chooses how much of it to invest and where to invest it. His budget constraint is:

$$(2.2) \quad 1 + e^i \geq c^i + k^i + b^i,$$

where  $k^i$  and  $b^i$  denote domestic and foreign investment, respectively. The variable  $e^i$  is distributed in the population with zero mean, negative median and bounded support

inside the interval  $[-1, 1]$ .

In the second period, every individual pays capital taxes and receives a lump sum transfer,  $g$ , from the government. The second period budget constraint is:

$$(2.3) \quad (1 - \theta)k^i + (1 - \theta^*)b^i + g - M(b^i, \mu) \geq d^i,$$

where  $\theta$  and  $\theta^*$  denote the domestic and foreign tax rate on capital, respectively, and  $M(b^i, \mu)$  denote the net "mobility costs" of investing abroad. These costs refer to all the extra complications that foreign direct investment requires compared to domestic investment. For instance,  $M(b^i, \mu)$  can represent the cost of gathering extra information about legal issues or about marketing, of overcoming country-specific regulations, of hiring foreign employees, and so on. But it can also represent the benefits of foreign investment closer to the market, or of foreign control. The parameter  $\mu$  measures the size of these mobility costs. One of the questions addressed in this paper concerns the consequences of a reduction in  $\mu$ .

Throughout the paper we assume that  $M(b^i, \mu) \equiv \mu(b^i)^2 + \gamma b^i$ , where  $\gamma$  is a parameter that captures the possible incentives to invest abroad for other purposes than to exploit tax differences. This cost function is illustrated in *Figure 1*, for the case  $\gamma < 0$ . A higher value of  $\mu$  shifts the function to the position of the dotted curve, which has higher total and marginal mobility costs, as well as steeper marginal mobility costs. If  $\gamma = 0$  the curve is symmetric around the vertical axis; in this case  $b^i = 0$  minimizes mobility costs. But if  $\gamma \neq 0$  there is a marginal benefit or cost to investing abroad at this point. In particular,  $\gamma \neq 0$ , could reflect specific foreign investment opportunities, and would capture the bidirectional flow of direct investment that one observes across many industrialized countries. Below we discuss the implications of alternative assumptions about the sign of  $\gamma$ .<sup>2</sup>

In line with our aim to focus on foreign direct investment within Europe, we assume

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<sup>2</sup> These rather specific assumptions about  $M(\ )$  can be generalized, provided that the qualitative features of *Figure 1* are preserved.

that the source principle of capital taxation applies. Thus, all capital in the domestic country is taxed at the same rate  $\theta$ , irrespective of who owns it. And all capital invested in the foreign country is taxed at the rate  $\theta^*$ , also irrespective of ownership. As argued for instance in Tanzi and Bovenberg (1989), this is in practice the relevant principle for the corporate income tax, now and presumably after 1992. Finally, we only consider a purely redistributive fiscal policy: all tax proceeds are distributed as equal lump sums to every individual. Under these assumptions, we can write the government budget constraint as:

$$(2.4) \quad \theta k + \theta b^* \geq g,$$

where  $k$  and  $b^*$  denote average investment by domestic and foreign citizens respectively. Throughout this and the next section, a policy means a tax policy, and hence the determination of  $\theta$  (or  $\theta^*$ ).

The description of the foreign country is symmetric. In particular, foreign investors also bear a mobility cost  $M^*(b^{*i}, \mu)$  to invest in the domestic country.

The timing of events is as follows: First, simultaneously in both countries a policymaker (government) is elected under majority rule. Second, the elected policymakers in the domestic and foreign countries simultaneously commit to a value for  $\theta$  and  $\theta^*$  respectively. Finally, having observed  $\theta$  and  $\theta^*$ , private investors make their investment decisions.

A politico-economic equilibrium must satisfy three optimality conditions: (i) Private agents: for every value of  $\theta$  and  $\theta^*$ , economic decisions are optimal for private agents and markets clear. (ii) Elected policymakers: given how private agents respond to the policy, and given  $\theta^*(\theta)$ , the domestic (foreign) policy is optimal for the domestic (foreign) policymaker. (iii) Voters: given how the domestic and foreign policymakers set policy, and given the identity of the foreign (domestic) policymaker, the domestic (foreign) policymaker is preferred to any other domestic (foreign) candidate by a majority of the domestic (foreign) voters.

Two remarks about this equilibrium are in order. First, because of the timing, there



is no credibility problem vis-à-vis the private sector in the choice of the capital tax rate. We refer the reader to Persson and Tabellini (1989) for an extensive discussion of these credibility problems and of how the timing assumed here can be enforced through the appropriate design of political institutions.

Second, under this timing, the voters (unlike the elected policymakers) do not take the foreign policy as given (even though they do take the foreign election outcome as given). Hence, the outcome of elections is — at least partly — driven by a strategic motive: a successful candidate is one who can yield a favorable Nash equilibrium in the subsequent policy game. In other words, since policymakers behave as Nash players when setting  $\theta$ , whereas voters do not when evaluating  $\theta$ , there is an agency problem: voters may wish to elect a policymaker that does not share their own preferences. This agency problem is studied in the next section.<sup>3</sup>

## 2.2 Equilibrium Savings and Investment

Consider first the solution to the consumer optimization problem. The first order conditions imply:

$$(2.5a) \quad c^i = U_c^{-1}(1 - \theta) \equiv C(\theta)$$

$$(2.5b) \quad b^i = M_b^{-1}(\theta - \theta^*, \mu) \equiv B(\theta, \theta^*, \mu)$$

$$(2.5c) \quad k^i = 1 + e^i - C(\theta) - B(\theta, \theta^*, \mu) \equiv K(\theta, \theta^*, \mu) + e^i$$

$$(2.5d) \quad d^i = g + (1 - \theta)K(\theta, \theta^*, \mu) + (1 - \theta^*)B(\theta, \theta^*, \mu) - M(B(\theta, \theta^*, \mu), \mu) + (1 - \theta)e^i,$$

where a subscript denotes a partial derivative. Thus, first period consumption and foreign investment are the same for every consumer, irrespective of how wealthy he is. Only domestic investment and second period consumption differ across consumers by the linear

<sup>3</sup> A third remark is that identifying the policy with  $\theta$  and  $\theta^*$ , rather than  $g$  and  $g^*$ , is not as innocuous as it may appear. Since the elected policymakers behave as Nash players with respect to each other, the equilibrium policy reflects the properties of the policy reaction functions. Choosing a different instrument would lead to different reaction functions and hence to a different equilibrium, as in the oligopoly literature where firms can set either prices or quantities. The main qualitative results, though, do not depend on which policy instrument is chosen. This point is also made by Tabellini (1987) in the context of a game of monetary and fiscal policy coordination.

term  $e^i$ . This property of the model is very convenient; it follows from the specification of the utility function (2.1), which implies that all the income effects are absorbed by second period consumption.

Concavity of the utility function  $U(\cdot)$  and convexity of the mobility cost function  $M(\cdot)$  imply that:

$$(2.6a) \quad B_\theta = -B_{\theta^*} > 0$$

$$(2.6b) \quad K_\theta = -C_\theta - B_\theta < 0$$

$$(2.6c) \quad K_{\theta^*} = -B_{\theta^*} > 0.$$

In words, a higher domestic tax on capital,  $\theta$ , increases capital flight ( $B_\theta > 0$ ) and reduces savings ( $C_\theta > 0$ ), thereby reducing domestic investment. And a higher foreign tax on capital,  $\theta^*$ , has the opposite effect on domestic capital flight and hence on domestic investment.

### 2.3 Equilibrium of the Policy Game

We are now ready to describe the equilibrium policy choices of the elected policymakers. Let  $e^g$  be the endowment of whoever happens to be elected as policymaker in the domestic country. By (2.5) and by the government budget constraint (2.4), we can write his indirect utility function as:

$$(2.7) \quad W^g(\theta, \theta^*, \mu) \equiv U(C(\theta)) + K(\theta, \theta^*, \mu) + \theta B^*(\theta^*, \theta, \mu) - \\ M(B(\theta, \theta^*, \mu), \mu) + (1 - \theta^*)B(\theta, \theta^*, \mu) + (1 - \theta)e^g.$$

Similarly, let  $e^{*g}$  denote the endowment of the foreign policymaker, and let his indirect utility function  $W^{*g}(\theta^*, \theta, \mu)$  be defined like in (2.7).

The equilibrium policies in the domestic and foreign country,  $\theta^g$  and  $\theta^{*g}$  respectively, are defined by the Nash conditions that both policymakers play their best response to their foreign counterpart:

$$(2.8a) \quad \theta^g = \text{Argmax}_\theta W^g(\theta, \theta^{*g}, \mu)$$

$$(2.8b) \quad \theta^{*g} = \text{Argmax}_{\theta^*} W^{*g}(\theta^*, \theta^g, \mu).$$

Let us differentiate (2.7) with respect to  $\theta$ , taking  $\theta^*$  as given and using the

consumer first order conditions, and then repeat the same procedure for the foreign policymaker. Then we obtain that at an interior optimum  $\theta^g$  and  $\theta^{*g}$  are defined by the following optimality conditions:

$$(2.9a) \quad B^* - e^g - \theta^g(C_\theta + B_\theta - B_\theta^*) = 0$$

$$(2.9b) \quad B - e^{*g} - \theta^{*g}(C_{\theta^*} + B_{\theta^*} - B_{\theta^*}) = 0,$$

where it is understood that  $B^*$ ,  $C_\theta$ ,  $B_\theta$ ,  $B_\theta^*$ , and the foreign counterparts, are evaluated at the point  $\theta^g$ ,  $\theta^{*g}$ .

Equations (2.9) define the reaction functions of the domestic and the foreign policymaker. The first two terms in (2.9a) capture the marginal gain of raising  $\theta$ , taking the form of a direct redistributive effect. A higher domestic capital tax rate can redistribute in favor of the domestic policymaker from two sources: from foreign investors in the domestic country, in proportion to their foreign investment,  $B^*$ ; and from wealthier domestic investors, in proportion to the difference between the average endowment ( $0$ ) and the policymaker endowment ( $e^g$ ). The remaining terms in (2.9a) capture the marginal cost of raising  $\theta$ ; this cost takes the form of a marginal loss of tax revenue due to a unilateral increase in the domestic capital tax rate, not accompanied by an increase in the foreign rate. There are three sources of revenue loss: a higher  $\theta$  leads to less savings ( $C_\theta > 0$ ), to more capital flight ( $B_\theta > 0$ ), and to less foreign investment ( $B_\theta^* < 0$ ). In equilibrium, the marginal redistributive gain must equal this marginal loss of revenue. Clearly,  $\theta^g > 0$  only if the marginal gain is positive (if  $B^* - e^g > 0$ ). An analogous interpretation holds for the foreign reaction function, equation (2.9b).

It is apparent from (2.9) that in this model fiscal policy has two external effects on the foreign country, one on the marginal gain and one on the marginal cost of taxation. First, there is the taxation of foreign investment. This effect, which we call the "tax-the-foreigner" effect, increases the marginal gain and hence tends to push the tax rate on capital above the Pareto efficient frontier of the game (i.e., above the rate that would be set in a cooperative equilibrium). Second, there is the effect on the international

allocation of investment: by unilaterally lowering its tax rate, the domestic country attracts capital (domestic and foreign) that otherwise would have been invested abroad. This effect, which we call the "tax-competition" effect, increases the marginal cost and hence tends to push the tax rate on capital below the Pareto efficient frontier of the game. These two effects work in opposite directions. Depending on which one prevails, the equilibrium tax rates in both countries can be above or below the cooperative equilibrium rates.

The two reaction functions are illustrated in *Figure 2*. Equation (2.9a) implicitly defines  $\theta$  as a function  $\theta = T(\theta^*, e^g, \mu)$ . And (2.9b) implicitly defines  $\theta^*$  as a function  $\theta^* = T^*(\theta, e^{*g}, \mu)$ . By the implicit function theorem, we can show that  $T_\theta^* > 1 > T_{\theta^*} > 0$ . Hence, the two reaction functions can be drawn as the solid lines in *Figure 2*. The Nash equilibrium is point  $N$ , where they intersect.

The positions of the reaction functions depend on the endowments of the two policymakers,  $e^g$  and  $e^{*g}$ , and on the mobility costs,  $\mu$ . As  $e^g$  rises, the marginal gain of capital taxation is reduced, and the domestic reaction function shifts down, say to where the dotted line is. As a result, the Nash equilibrium corresponds to lower domestic and foreign tax rates. Intuitively, as  $e^g$  increases, the domestic policymaker becomes wealthier. He is thus less willing to tax in order to redistribute. The best response of the foreign policymaker to a lower  $\theta$  is also to reduce  $\theta^*$ . Hence, in equilibrium both governments reduce their tax rates as  $e^g$  increases. Raising the endowment of the foreign policymaker,  $e^{*g}$ , has a similar effect on the equilibrium.

What are the effects of a change in the mobility costs,  $\mu$ ? Applying the implicit function theorem to (2.9a) and (2.9b), we get that as  $\mu$  rises the two reaction functions are shifted by:

$$(2.10a) \quad T_\mu(\theta^*, e^g, \mu) = B_\mu^* - \theta^g(B_{\theta\mu} + B_{\theta^*\mu}^*)$$

$$(2.10b) \quad T_\mu^*(\theta, e^{*g}, \mu) = B_\mu - \theta^g(B_{\theta^*\mu}^* + B_{\theta\mu}).$$

The first term on the right hand side of (2.10) indicates that higher mobility costs reduce

the marginal gain of capital taxation (since  $B_{\mu}^* B_{\mu} \geq 0$  as  $B^*, B \leq 0$  respectively). Intuitively, the first term on the right hand side of (2.10) captures what we called the "tax—the-foreigner" effect: A higher  $\mu$  reduces foreign investment, and hence the incentive to maintain a high rate so as to tax foreign investors. The second term on the right hand side of (2.10) indicates that higher mobility costs also reduce the marginal cost of capital taxation (since  $B_{\theta\mu}, B_{\theta\mu}^* < 0$ ). This term refers to what we called the "tax—competition" effect: A higher  $\mu$  reduces the elasticity of capital movements with respect to tax differentials, and hence reduces the marginal revenue loss as  $\theta$  is unilaterally increased. If  $B, B^* > 0$  these two effects work in opposite directions. Hence, the sign of  $T_{\mu}$  and  $T_{\mu}^*$  is ambiguous, and the reaction functions of *Figure 2* can shift either up or down as  $\mu$  increases. As such, a reduction in the mobility costs (a lower  $\mu$ ) can either increase or decrease the Nash equilibrium tax rates on capital.

Most of the literature neglects the tax—the-foreigner effect, and generally concludes that higher capital mobility leads to lower tax rates on capital — see Wilson (1987), Wildasin (1988). In terms of our model, this is equivalent to assuming that the parameter  $\gamma$  of the mobility cost function is close to zero, so that in the absence of tax differentials one would observe no capital movements. In this case, and if the equilibrium is symmetric,  $T_{\mu}, T_{\mu}^* > 0$ : both reaction functions shift up as  $\mu$  increases, and the equilibrium tax rates move in the same direction as the mobility costs.

But the assumption that there would be no significant foreign investment in the absence of tax differentials is clearly counterfactual. In general, the tax—competition effect could be larger or smaller than the tax—the-foreigner effect. So, even if we neglect the political repercussions of changes in  $\mu$  and limit the analysis to the policy game with predetermined government preferences, there should be no presumption that higher capital mobility leads to higher or lower equilibrium capital tax rates.<sup>4</sup> In the next section we

<sup>4</sup> The tax competition effect would be reinforced, however, if capital is complementary to other inputs (such as labor) in the production process—see Wilson (1987) for a more detailed analysis of

show that this conclusion is reinforced by the analysis of the voting equilibrium.

### 3. Political Equilibrium and Increased Capital Mobility

#### 3.1 The Political Equilibrium

We now turn to a description of the third stage of the game, in which voters elect a policymaker. The indirect utility function of the  $i^{\text{th}}$  voter is like in (2.7), except that  $e^g$  is replaced by  $e^i$ . This utility function is linear in the idiosyncratic parameter  $e^i$ . It thus belongs to the class of intermediate preferences—studied by Grandmont (1978). Then, provided that the second order conditions of the optimal tax problem are satisfied, the voters preferences for  $\theta$  are single peaked and can be ranked by the variable  $e^i$ . The majority rule equilibrium thus coincides with the decision that is optimal for the median voter, who in this case is the individual with median endowment, say  $e^m$ .

By assumption, the voters do not vote directly on the policy. They elect a policymaker who then chooses the policy. As explained in the previous section, the equilibrium policies  $\theta^g$  and  $\theta^{*g}$  are monotone functions of the endowment of the elected policymakers,  $e^g$  and  $e^{*g}$ . Hence, in each country the voters' preferences for the policy induce a preference ordering for the policymaker's endowment. This ordering also satisfies the single-peakedness condition. In equilibrium, the policymaker who wins the elections is that preferred by the median voter.

It is tempting to conclude from this argument that the median voter wishes to elect a policymaker with the same endowment as himself, so that in equilibrium  $e^g = e^m$ . But this conclusion would be wrong. Once a policymaker is elected, he moves simultaneously with his foreign counterpart. He thus takes  $\theta^*$  as given. But when voters evaluate

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this point.

alternative policies and vote on a policymaker, they realize that the foreign tax rate will be set according to (2.9b): they take the foreign reaction function and not the foreign action, as given. In other words, whereas voters evaluate the policy *ex ante*, before the move of the foreign policymaker, the policymaker evaluates it *ex post*, simultaneously with the move of the foreign policymaker. These two evaluations generally differ, even if the voter and the policymaker have the same endowment.

In the notation of the previous section, the optimal domestic policy from the point of view of the domestic median voter,  $\theta^m$ , is defined as:  $\theta^m = \text{Argmax}_{\theta} W^m(\theta, T^*(\theta, e^{*g}, \mu), \mu)$ . Note that here the domestic median voter takes the identity of the foreign policymaker,  $e^{*g}$ , as given. This is because elections are held simultaneously in the two countries. The optimal foreign policy from the point of view of the foreign median voter,  $\theta^{*m}$ , is defined analogously as:  $\theta^{*m} = \text{Argmax}_{\theta^*} W^{*m}(\theta^*, T(\theta^*, e^g, \mu), \mu)$ .

By (2.7) and (2.9), one obtains that  $\theta^m$  and  $\theta^{*m}$  are jointly defined by the following optimality conditions:

$$(3.1a) \quad B^* - e^{*m} - \theta^m(C_{\theta} + B_{\theta} - B_{\theta}^*) + T_{\theta}^*(\theta B_{\theta^*}^* - \theta B_{\theta^*} - B) = 0$$

$$(3.1b) \quad B - e^{*m} - \theta^{*m}(C_{\theta^*}^* + B_{\theta^*}^* - B_{\theta^*}) + T_{\theta^*}(\theta^* B_{\theta} - \theta^* B_{\theta}^* - B^*) = 0$$

where  $B, B_{\theta}, C_{\theta}$  and the foreign counterpart are evaluated at the equilibrium point  $\theta^m, \theta^{*m}$ . Equation (3.1) have the same interpretation as (2.9): at the optimum the marginal gain and the marginal cost of higher capital taxes are equated. The marginal gain of raising  $\theta$  is still like in (2.9). But the marginal cost now contains an additional term (the last term on the right hand side of (3.1)). This new term can be either positive or negative. Hence, the marginal cost perceived *ex ante* by the voter can be higher or lower than that perceived *ex post* by the policymaker once he is appointed. As in the previous section, this ambiguity reflects the presence of two effects working in the opposite direction: the tax—the-foreigner effect, and the tax—competition effect. Throughout the rest of this section we assume the latter effect to prevail, in line with most of the literature.

The last term on the right hand side of (3.1) is then positive (since  $T_{\theta}^* > 0$  and  $B_{\theta^*}^* - \theta B_{\theta^*} - B > 0$ , and similarly for the foreign country). As a consequence, the marginal cost of capital taxation is smaller *ex ante* than *ex post*.

This finding has a simple intuition. *Ex post*, the policymaker considers a unilateral increase in the domestic tax rate, taking the foreign rate as given. But *ex ante*, voters realize that raising the domestic tax rate (by appointing a poorer policymaker) induces the foreign country also to raise its rate (along its upward sloping reaction function). Hence, the marginal loss in tax revenue due to capital moving abroad is perceived to be smaller *ex ante* than *ex post*. As a consequence, the *ex ante* optimal capital tax rate is higher than the *ex post* optimal rate. In equilibrium, the median voters elect a policymaker who finds it *ex post* optimal to set  $\theta^g = \theta^m$  and  $\theta^{*g} = \theta^{*m}$  respectively. Combining (2.9) and (3.1), we thus obtain that the endowments of the policymakers who win the elections at home and abroad are:

$$(3.2a) \quad e^g = e^m - T_{\theta}^*(\theta B_{\theta^*}^* - \theta B_{\theta^*} - B)$$

$$(3.2b) \quad e^{*g} = e^{*m} - T_{\theta^*}(\theta^* B_{\theta} - \theta^* B_{\theta}^* - B^*)$$

Under the assumption that the tax competition effect prevails,  $e^g < e^m$  and  $e^{*g} < e^{*m}$ : in both countries the elected policymaker is poorer than the median voter. Since the marginal cost of capital taxation is higher *ex post* than *ex ante*, it is *ex post* incentive compatible for the policymaker to implement the *ex ante* optimal rate only if his marginal gain from taxing capital is higher than that of the median voter. Hence, the appointed policymaker must be poorer than the median voter. The same intuition explains why  $e^{*g} < e^{*m}$ .<sup>5</sup>

This point is of general validity. In the presence of an *ex post* incentive constraint, the political equilibrium endogenously delegates policy choices to an agent whose

<sup>5</sup> Of course, voters don't really have to go through the detailed argument we have just made, when they make their voting decision. As in any rational expectations model, all they have to know is the equilibrium mapping between elected policymakers and policies. Note also that there are no elements of strategic voting: each voter just votes for the policymaker that gives him the highest utility.



preferences differ from those of the majority of the voters. Under any modern democratic constitution the majority of the voters cannot later reverse this delegation and overrule the decisions of its political representative.<sup>6</sup> The voters only have an opportunity to reoptimize if the political representative chooses to resign. But since the equilibrium by construction is *ex post* optimal for the representative, the voters will not be given this opportunity (other than at new elections). Delegation through the political system is therefore self-enforcing.

Since, this delegation partially relaxes an incentive constraint, it is generally welfare improving for the majority of the voters.<sup>7</sup> Here, the incentive constraint is due to the country playing a non-cooperative Nash game with another country. Delegating policy to an agent takes the equilibrium closer to the Pareto frontier of the game among the median voters. But the same point would arise, even if the policy game was played in a different fashion, such as cooperative Nash bargaining. Or if the nature of the incentive constraint were due to domestic credibility problems, rather than to international spillover effects. This general point is discussed more extensively in Persson and Tabellini (1989).<sup>8</sup>

### 3.2 The Effects of Higher Capital Mobility

<sup>6</sup> In the language of modern political theory, this amounts to the political representative having "gate-keeping authority" vis-a-vis the voters. Ferejohn (1990) discusses how important gate-keeping authority is for making commitments feasible at a different level: congressional committees vis-a-vis congress.

<sup>7</sup> Naturally, the fact that delegating policy improves welfare for the median voter need not improve welfare for society as a whole. Whether it does depend on the particular social welfare function one adopts. Note also that in this model nobody would really wish to run for office (since everybody prefers to delegate the policy choice to a poorer agent). A way around this problem could be to assume that there are two kinds of individuals: voters and candidates. Candidates have ideological preferences, just like voters, but also have a desire to hold office *per se*. If for every individual type there are many voters and just one candidate, the equilibrium is as described above.

<sup>8</sup> See also Vickers (1984) for an application of a related idea to oligopoly theory. If we allowed the voters to appoint agents with reaction functions other than those in (2.9), we could get multiple equilibria, as in Fershtmann, Judd and Kalai (1989). Here this multiplicity does not appear because all the candidates have the preferences defined in (2.1). These preferences constrain what it is *ex post* optimal for a policymaker to do. Note also that in this framework the timing of elections in one country relative to the other matters: the country that holds elections first can act as a Stackelberg leader.

In the full politico-economic equilibrium, a change in the mobility costs,  $\mu$ , has two effects. First, for a given policymaker's endowment, it changes the Nash equilibrium of the policy game. This economic effect is described in the previous section by equation (2.10) and remains operative in the politico-economic equilibrium. But a change in  $\mu$  also has a second effect: it alters the political equilibrium. This can be seen by differentiating both sides of (3.2) with respect to  $\mu$ . We obtain:

$$(3.3) \quad \frac{de^g}{d\mu} = -T_{\theta\mu}^* (\theta B_{\theta^*}^* - \theta B_{\theta^*} - B) - T_{\theta}^* (\theta B_{\theta^*\mu}^* - \theta B_{\theta^*\mu} - B_{\mu}).$$

Thus, the identity of the elected policymaker changes with  $\mu$ . The same result applies for the foreign country. Again, the sign of (3.3) is ambiguous, since the tax-competition and the tax-the-foreigner effect work in opposite directions. Suppose that the tax-competition effect prevails. Then it can be shown that  $de^g/d\mu > 0$ : lower mobility costs (a lower  $\mu$ ) induce the voters to elect a poorer policymaker. This political effect partially offsets the direct economic effect described in the previous section, since a poorer policymaker sets higher capital tax rates. In a symmetric equilibrium, it can be shown that the political effect of a lower  $\mu$  is dominated by the economic effect. Thus, higher capital mobility leads to lower capital tax rates. But the change in the equilibrium rates is not as large as it would be if one neglected the political repercussions of higher capital mobility.

Intuitively, greater capital mobility increases the relevance of tax competition for the choice of fiscal policy. Thereby, it also increases the difference between the *ex post* and *ex ante* evaluation of the optimal capital tax rate. As such, the majority of the voters prefers to delegate policy decisions to a more radical (poorer) agent. This change in the domestic political equilibrium dampens the ultimate effect of greater capital mobility on the equilibrium tax policy.

If the two countries are not equal to each other, then we can no longer tell how the full equilibrium tax rates respond to increased capital mobility in both countries. The

reason is that now the tax—the-foreigner effect could prevail over the tax—competition effect in one country, but not in the other. We can nevertheless establish that increased capital mobility always leads to economic and political convergence: as  $\mu$  drops,  $\theta^m$  and  $\theta^{*m}$  approach each other, and so do  $e^g$  and  $e^{*g}$ . In particular, suppose that the domestic country is governed by a right-wing majority so that its tax rate is higher than in the foreign country. In terms of our notation:  $e^m > e^{*m}$ ,  $\theta^m < \theta^{*m}$  and  $e^g > e^{*g}$ . Consider a reduction in mobility costs. It can be shown that in the domestic (right-wing) country the elected government is pulled to the left ( $e^g$  drops), as in the symmetric case we discussed above. But in the foreign (left-wing) country, the the government is pulled to the left to a smaller extent, or it could even be pulled to the right. ( $e^{*g}$  drops by less or could rise). Thus,  $e^g$  and  $e^{*g}$  approach each other: higher capital mobility leads to political convergence. Similarly, it can be shown that higher mobility reduces  $\theta^{*m}$  by less than  $\theta^m$ , or even increases  $\theta^{*m}$ : there is economic convergence.

Finally, the economic and political consequences of a change in  $\mu$  always tend to offset each other, irrespective of what we assume about the relative importance of the tax—competition effect versus the tax—the-foreigner effect or about symmetry between the countries. Hence, the finding that the political equilibrium changes so as to dampen the effects of European integration on domestic policy formation is a general result of the model.

#### 4. Labor Taxation

In this section we want to highlight a second mechanism whereby European integration may change equilibrium fiscal policy. Whatever the aggregate effects of eliminating the remaining barriers to trade in goods markets, the sectoral effects are likely to be sizable. The relative factor rewards in different sectors will change and factors will move across

sectors. And these changes, in turn, may alter the political majority that decides on fiscal policy.

#### 4.1 Economic Equilibrium

The simplest possible model to demonstrate these points is a static one-economy, two-sector model with only one factor. We take this factor, which is also the only tax base, to be labor. We shall refer to the two sectors as the export sector and the import-competing sector. Of all the workers in the economy, a share  $n$  is in the import-competing sector and  $(1-n)$  in the export sector. For the moment we treat  $n$  as a parameter, but below we shall discuss how the results would change if  $n$  were endogenous.

One (efficiency) unit of labor gives one unit of output in both sectors. Let export goods be the numeraire and let the (producer) price of import goods in the rest of Europe be  $p^*$ . To start with, we treat  $p^*$  as a parameter, but below we will discuss how to endogenize  $p^*$  in a two-country model. The import-competing sector enjoys some protection from any remaining barriers to trade. Assume that these trade barriers can be summarized by a per-unit mobility or transactions cost of  $\mu$ , and that these costs are paid by the importer. It follows that the domestic price of import goods is

$$(4.1) \quad p = (p^* + \mu).$$

The (production) wage in the export sector is unity. If we let  $(1 + w)$  denote the wage in the import-competing sector, perfect competition implies

$$(4.2) \quad (1 + w) = p = (p^* + \mu).$$

The wage premium,  $w$ , in the import-competing sector can obviously be either positive or negative, and we study both cases below. But to fix ideas, we shall take  $w$  to be positive when we go through the model.

In each of the two sectors, there is a continuum of workers. Worker  $x$  in the export sector has a time endowment of  $(e + a^x)$  units, where  $a^x$  is distributed with a mean of zero, cumulative distribution function  $H(a^x)$ , and bounded support within the

interval  $[-1, 1]$ . Worker  $i$  in the import-competing sector has a time endowment  $1 + a^i$ , where  $a^i$  has an identical distribution as  $a^x$ . We follow the convention of indexing variables associated with workers in the export sector by  $x$  and variables associated with workers in the import competing sector by  $i$ .

Let  $c$ ,  $d$ , and  $z$  be the consumption of import goods, export goods, and leisure, respectively. Then the preferences of worker  $x$  in the export sector can be written:

$$(4.3) \quad W^x \equiv U(c^x) + a^x + V(z^x),$$

where  $U(\cdot)$  and  $V(\cdot)$  are concave functions. If we let  $l^x$  denote labor supply of worker  $x$ , then  $z^x = e + a^x - l^x$ . Worker  $i$  in the import-competing sector has the same preferences, but not necessarily the same consumption levels:  $c^i$ ,  $d^i$ , and so on.

The budget constraint for worker  $x$  is

$$(4.4a) \quad pc^x + d^x - (1 - \tau)l^x = g,$$

where  $\tau$  is the tax on labor income and  $g$ , as before, a government lump sum transfer payment. Worker  $i$  has a similar budget constraint, namely

$$(4.4b) \quad pc^i + d^i - (1 - \tau)(1 + w)l^i = g,$$

The demand and supply functions follow easily:

$$(4.5a) \quad c^x = c^i = U_c^{-1}(p) \equiv C(p)$$

$$(4.5b) \quad l^x = e + a^x - V_z^{-1}(1 - \tau) \equiv L(\tau) + a^x$$

$$(4.5c) \quad l^i = e + a^i - V_z^{-1}((1 + w)(1 - \tau)) \equiv \hat{L}(w, \tau) + a^i$$

$$(4.5d) \quad d^x = (1 - \tau)(L(\tau) + a^x) - pC(p) + g$$

$$(4.5e) \quad d^i = (1 + w)(1 - \tau)(\hat{L}(w, \tau) + a^i) - pC(p) + g.$$

Substituting from (4.5) into the utility function (4.3), we get the indirect utility functions of workers in the two sectors:

$$(4.6a) \quad W^x(\tau, g, p) \equiv U(C(p)) + V(1 - L(\tau)) \\ + (1 - \tau)L(\tau) - pC(p) + g + (1 - \tau)a^x$$

$$(4.6b) \quad W^i(\tau, g, p, w) \equiv U(C(p)) + V(1 - \hat{L}(w, \tau)) \\ + (1 + w)(1 - \tau)\hat{L}(w, \tau) - pC(p) + g + (1 + w)(1 - \tau)a^i.$$

The government budget constraint can again be formulated in terms of averages.

$$(4.7) \quad g = G(\tau, w, n) = \tau[(1-n)L(\tau) + n(1+w)\hat{L}(w, \tau)].$$

As before, we shall constrain the policy instruments,  $\tau$ , and  $g$ , to be non-negative.

#### 4.2 Policy Preferences

Now we have collected enough preliminaries to discuss the policy preferences of workers in the two sectors. Consider first worker  $x$  in the export sector. His optimal tax rate is implicitly defined by the condition  $W_\tau^x + W_g^x G_\tau = 0$ . With some algebra, we can express this condition as<sup>9</sup>

$$(4.8a) \quad -a^x + n((1+w)\hat{L}(w, \tau) - L(\tau)) + \tau L_\tau(\tau) = 0.$$

As in our previous model, higher taxes that finance higher transfers redistribute income across individual workers according to their individual labor income. The sum of the first two items in (4.8a) is the difference between worker  $x$ 's labor income and mean labor income in the economy: his individual income is  $L(\tau) + a^x$  and mean income is  $(1-n)L(\tau) + n(1+w)\hat{L}(w, \tau)$ . Higher taxes redistribute in favor of worker  $x$  if he has a smaller (larger) than average endowment; that is, when  $a^x$  is negative (positive). This is captured by the first term. But higher taxes also redistribute income across sectors. This is captured by the second term. It is positive (negative) because average incomes in the import-competing sector are higher (lower) than in the export sector, when  $w$  is positive (negative). The third term, finally, captures the marginal cost of raising taxes, which is always negative for positive  $\tau$ .

It follows from (4.8a) that the optimal tax rate is positive even if  $a^x = 0$ . That is, an export-sector worker with an average endowment still has an income below mean income. He has an incentive to redistribute via distortionary taxes because such taxes redistribute in his favor from the higher paid workers in the import-competing sector.

The optimality condition for a worker in the import-competing sector can be

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<sup>9</sup> In the derivation, we use  $L_\tau(\tau) = (1+w)\hat{L}_\tau(w, \tau)$ .

similarly derived. It reads:

$$(4.8b) \quad -(1+w)a^i - (1-n)((1+w)\hat{L}(w, \tau) - L(\tau)) + \tau L_\tau(\tau) = 0.$$

For that worker, the incentive to redistribute across sectors obviously pulls in the opposite direction as witnessed by the negative second term. Thus, if we compare workers with the same endowments in the two sectors, so that  $a^x = a^i$ , the worker in the export sector always wants higher taxes (as long as  $w > 0$ ).

## 5. Political Equilibrium and Increased Mobility

### 5.1 Political Equilibrium

We are now ready to discuss the political equilibrium. Individual preferences are intermediate and hence single-peaked, so a median-voter result will hold as it did in the previous model: the person casting the pivotal vote will be the person with median labor income. But the political equilibrium will differ in two crucial respects from our previous equilibrium. There, the individual who cast the pivotal vote was exogenous to the analysis, namely the individual with the median endowment. On the other hand, the median voter appointed a policymaker an endowment different from his own, because of the agency problem. Here, the individual who casts the pivotal vote is endogenous to the analysis, namely the individual with median labor income. On the other hand, there is no agency problem, so the median voter appoints a policymaker with the same endowment as his own.

In general, it is quite hard to determine exactly who is the median voter: the individual with median labor income. To see the difficulty, consider *Figure 3*. In the figure we have drawn—by dotted lines—two possible distribution functions for labor income in the two sectors, and plotted mean income in each sector along the horizontal axis (we continue to assume  $w > 0$  so the rightmost distribution belongs to the

import-competing sector). The position and the shape of these distributions depend on the wage premium,  $w$ , as well as on the policy,  $\tau$ . And their relative height depends on,  $n$ , the relative size of the two sectors. To find the economy-wide distribution of labor income—the solid line—we have to add these two distributions. It is clear that the resulting distribution will be endogenous and depend in a complicated way on the model's parameters.

Let us nevertheless see how can we determine the equilibrium policy, in the general case. First use (4.8) to define two functions,  $a^x = A^x(\tau, w, n)$  and  $a^i = \hat{A}^i(\tau, w, n)$ . These functions thus associate a particular worker in each sector with the tax rate that he finds optimal (given  $w$  and  $n$ ). Then the equilibrium tax rate is  $\max(0, \tau^m)$ , where  $\tau^m$  solves the following equation:

$$(5.1) \quad (1-n)H(A^x(\tau, w, n)) + nH(\hat{A}^i(\tau, w, n)) - 1/2 = 0;$$

$H(\cdot)$  being the cumulative distribution of both  $a^x$  and  $a^i$ .

Is  $\tau^m$  positive? The answer is yes, as long as median labor income in the economy is below mean labor income. A sufficient condition for this to be true is that the median time endowment is non-positive. If so, the incentive to redistribute across sectors will always be strong enough to generate positive taxes and transfer payment in equilibrium. Three things determine the value of  $\tau^m$  in general: (1) the concavity of  $V(\cdot)$  which affects the shape of  $L(\cdot)$  and  $\hat{L}(\cdot)$  and therefore of  $A^x(\cdot)$  and  $\hat{A}^i(\cdot)$ , (2) the shape of the distribution function  $H(\cdot)$ , and (3) the parameters  $w$  and  $n$ .

To make further progress on characterizing the, we consider a specific example. We assume that the  $V(\cdot)$  function is logarithmic so that

$$(5.2) \quad (1+w)\hat{L}(w, \tau) = w + (e - \frac{1}{1-\tau}) = w + L(\tau).$$

It follows that mean labor income,  $y$ , in this case is simply

$$(5.3) \quad y = Y(\tau, n, w) \equiv L(\theta) + n((1+w)(\hat{L}(w, \tau)) - L(\tau)) = L(\tau) + nw.$$

Furthermore, we assume that  $a^x$  (and  $a^i$ ) is uniformly distributed on the support  $[-1, 1]$ .

Then, obviously



$$(5.4) \quad H(a^x) = \frac{1+a^x}{2}.$$

Using (4.8), (5.2) and (5.4) to evaluate (5.1), we get

$$(5.5) \quad \left[ (1-n)nw \left( \frac{w}{1+w} \right) \right] + \tau L_\tau(\tau) \left[ 1-n \left( \frac{-w}{1+w} \right) \right] = 0.$$

Since  $L_\tau(\tau)$  is negative and the square bracketed expressions are both positive,  $\tau^m$  is indeed positive.

Denote the endowment of the median voter in the export sector by  $a^m$ . We can then solve for  $a^m$  by combining (4.8a) and (5.5). This yields  $a^m = nw/(1+w(1-n))$ . So the idiosyncratic endowment of the pivotal voter in the export sector is positive. Clearly, since the uniform distribution is symmetric around zero, the endowment of the pivotal voter in the import-competing sector must be negative.<sup>10</sup> So a coalition of a majority of the workers in the export sector and a minority of the workers in the import-competing sector supports some redistribution in equilibrium.

For future reference we note that median labor income  $y^m$ , in the example is:

$$(5.6) \quad y^m = Y^m(\tau, n, w) = L(\tau) + \frac{nw}{1+w(1-n)}.$$

Of course, the same kind of argument holds even if the import-competing sector has a lower mean wage than the export sector, so that  $w$  is negative. In that case, the redistribution goes the other way and the coalition of voters that supports the policy is composed of a majority of the workers in the import-competing sector and a minority of the workers in the export sector. The case of a positive  $w$  is probably most relevant for Southern Europe and the case of a negative  $w$  is probably most relevant for Northern Europe.

## 5.2 Increased Mobility

What does the model tell us about the effect of European integration? Diminishing the remaining trade barriers corresponds to a decrease in  $\mu$  in the model. This decreases the

<sup>10</sup> Since there is a continuum of workers, we can ignore integer problems. It does not matter whether we consider the pivotal worker to be a worker in the export sector or a worker in the import-competing sector.

domestic price of import-competing goods and hence lowers the wage in the import-competing sector (recall (4.2)). This change in relative wages changes the incentive to redistribute income across sectors and also changes the identity of the median voter. The above discussion suggests that to figure out the effect on the equilibrium tax rate, we should look at how a change in the wage changes mean labor income and median labor income at a *constant* tax rate. If the gap between mean and median income widens, the tax rate will rise in equilibrium. Otherwise, the tax rate will fall. It is natural to call the change in mean income "the economic effect" and the change in median income "the political effect".

It is clear that mean income falls when  $w$  falls. For a given median this tends to push  $\tau$  down since the incentive to redistribute across sectors has fallen. But a fall in  $w$  also lowers median labor income (except in the extreme case when  $w$  is so high (low) and  $n$  is so small that the whole support of the distribution of labor income in the import-competing sector is above (below) median labor income in the economy as a whole). And this tends to push  $\tau$  up, since a poorer worker has a larger incentive to redistribute. Thus the economic effect and the political effect push in opposite directions.

However, we strongly believe that which direction  $\tau$  goes should depend only on the initial sign of  $w$ , with the possible exception of extreme cases. To see the intuition for this, consider *Figure 3* again, and note that a fall in  $w$  alone only shifts the distribution function for the import-competing sector. If  $w$  is positive—so that the import-competing sector is a high-wage sector—a fall in  $w$  tends to compress the economy-wide distribution, which typically should narrow the gap between mean and median income and therefore push  $\tau$  down. But if  $w$  is negative, a fall in  $w$  instead makes income inequality larger, which should push  $\tau$  up.

Our log-utility, uniform-distribution example clearly produces this result. It follows from (5.3) and (5.6) that

$$(5.7) \quad Y_w = n \begin{cases} \geq \\ < \end{cases} \frac{n}{(1+u(1-n))^2} = Y_w^n \text{ as } w \begin{cases} \geq \\ < \end{cases} 0.$$

Thus, the economic effect dominates if the import-competing sector is the high wage sector, while the political effect dominates if the import-competing sector is the low wage sector. In other words taxes fall if the sectoral wage gap narrows and rise if it widens.

We have not been able to establish that this is always true. (We can solve for the effect on the equilibrium tax rate in the general case by applying the implicit function theorem to (5.1).) However, we do believe that the result generalizes to more general preferences and distribution of endowments: we may need only assumptions about the concavity of  $V(\cdot)$  and mild regularity assumptions, such as the endowment distribution being unimodal and having a non-positive median. But we have, so far, not been able to come up with a general result.

Our model thus suggests that what happens to government transfer payments and taxes when we remove protection of the import-competing sector, depends on whether the wage gap between the sectors—and thereby the incentive for cross-sector distribution—goes up or down.

In a sense, the comparative statics in this model of labor taxation parallel those in our previous model of capital taxation. There, we concluded that the economic effect of higher capital mobility—increased tax competition—tended to push the tax rate down. But the political effect, the endogenous change of the policymaker's preferences, counteracted this effect. Here, as we have seen, a similar mechanism is at play. The political effect, namely the endogenous change of the policymaker — even though it occurs through another mechanism — again counteracts the economic effect of the change in mobility on equilibrium policy.

But in another sense, the results are different. In the capital taxation model we always had economic convergence and political convergence between different countries. Suppose we think of two different countries in this model: one has a high-wage,

import-competing sector,  $w > 0$ ; the other has a high-wage, export sector,  $w^* < 0$ . Suppose, further, that  $w^* = -w$ . The above results show that economic divergence—a divergence in the equilibrium tax rate—is definitely possible in general. In the specific example, economic divergence is certain. To see this, note that, from (5.3) and (5.6)

$$(5.8) \quad (y^* - y^{*m}) = \frac{n(1-n)w^2}{1-w(1-n)} > \frac{n(1-n)w^2}{1+w(1-n)} = y - y^m > 0.$$

Thus, the distance between mean and median income is larger in the country with  $w^* < 0$ , implying that  $\tau^* > \tau > 0$ , before the change in mobility. The result in (5.7) shows that  $\tau^*$  and  $\tau$  are driven further apart when mobility increases. Because the political effect is stronger when  $w < 0$  than when  $w > 0$ , there is also political divergence.

### 5.3 Extensions

Let us close this section by discussing two possible extensions of the model. One plausible extension would be to endogenize the sectoral allocation of workers. This could be done, for example, by introducing an individual-specific mobility cost for each worker along the lines of Diamond (1982). This would probably not change the qualitative results. In the extended model  $w$  and  $n$  would presumably be positively related (workers would move out of the import-competing sector if the wage there fell). How would a change in  $n$  affect mean and median income? Our specific example provides a definite result. Differentiating (5.3) and (5.6) we get:

$$(5.9) \quad Y_n = w \quad \text{and} \quad Y_n^m = w \frac{(1+wn)}{(1+w(1-n))^2}.$$

Suppose  $w > 0$ . Then  $Y_n$  is larger than  $Y_n^m$ , unless  $n$  is very large. Once again, the economic effect dominates the political effect. It follows, of course, that if both  $w$  and  $n$  fell as a result of a fall in  $\mu$ , we would get the same qualitative effect, namely a fall in  $\tau$ .

The second extension would be to go to a full-fledged two-country equilibrium as in our model of capital taxation. In such a two-country model, the terms of trade would no longer be exogenous. That would reintroduce externalities in the policy game, as in many existing models of policy coordination. But the effects of these externalities on

equilibrium policy would, we conjecture, be mitigated by the median voter appointing a policymaker with different policy preferences along the same lines as in our capital-taxation model.

## 6. Conclusions

The central message of this paper is that the creation of a single European market will have both economic and political repercussions. Neglecting the political repercussions can lead one to overestimate the effects of European integration on domestic policy formation, or even to predict policy changes in the wrong direction.

There are two ways in which European integration can change the domestic political equilibrium. First, it may change the voters' preferences for their elected government representatives. Our analysis of capital taxation provides an example of this phenomenon. Higher capital mobility within Europe increases the relevance of international strategic considerations for domestic tax policy. Voters find it optimal to respond by electing a government which is less sensitive to these strategic aspects of tax policy. Hence, the political system mitigates the changes in the external environment; society finds a way to adapt, perhaps without major changes in its behavior.

The second way European integration can change the domestic political equilibrium is through the process of coalition formation. Our analysis of labor taxation provides an example of this second phenomenon. European integration is likely to result in reallocation of resources within each country, and in changes in relative incomes across sectors. In our model, these sectoral effects change the political majority. Once more, the political and economic repercussions of integration work in opposite directions, but here the political effects can even *dominate* the economic effects.

One final point: A general question receiving a great deal of attention in Europe is

whether 1992 will bring about economic and political convergence. In our model of capital taxation there is always economic and political convergence. But in our model of labor taxation, economic and political divergence is likely. These results clearly derive from our assumptions that capital is highly mobile internationally, while labor is not mobile at all. Even though we may have overstated the immobility of labor, we think that such a link between mobility and convergence is intuitively very appealing.

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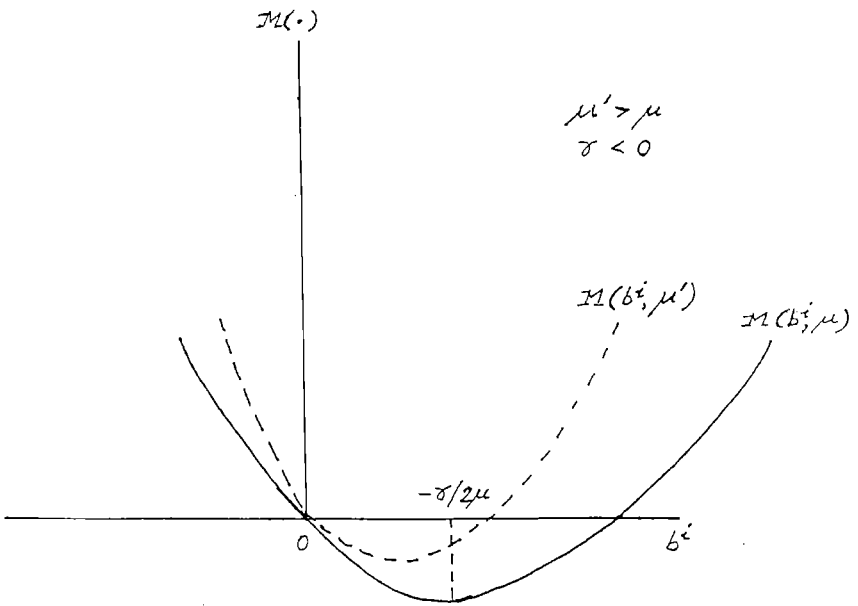


Figure 1



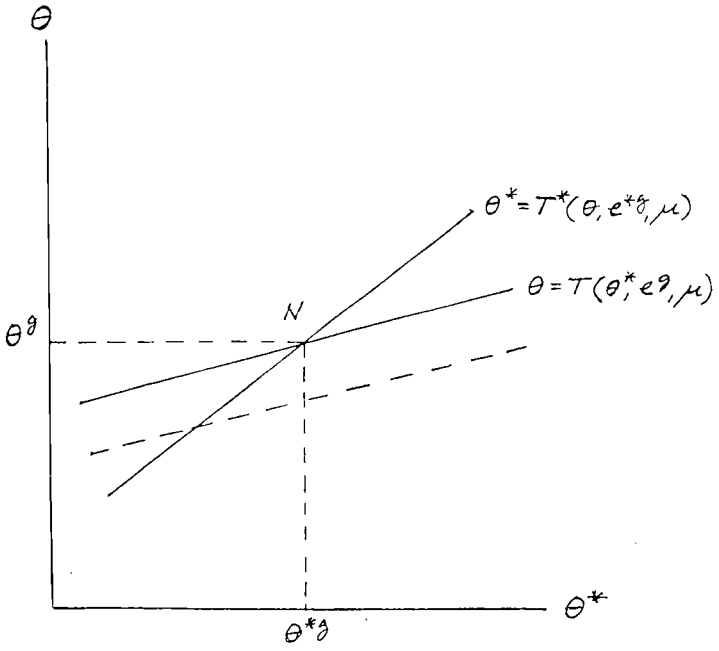


Figure 2

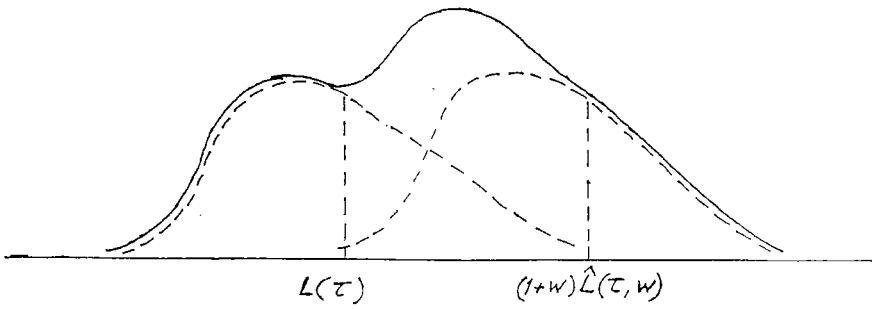


Figure 3