Working Paper No. 84/00

Global Economics and National Politics

by

Rune Jansen Hagen
Gaute Torsvik

SNF-project No. 1105
"Democracy and Economic Policy"

The project is financed by the Research Council of Norway

FOUNDATION FOR RESEARCH IN ECONOMICS AND BUSINESS ADMINISTRATION
BERGEN, DECEMBER 2001

ISSN 0803-4028

Global Economics and National Politics

Rune Jansen Hagen*and Gaute Torsvik†

December 21, 2001

Abstract

This paper contributes to the literature on the political economy of increased capital mobility. Two parties, one from the left and one from the right, compete for position. The election is to be held in the future and the outcome is uncertain. Prior to the elections, the members of both parties nominate their prime ministerial candidates. Investors mind about the outcome since they may invest in irreversible domestic capital. We find that there is political convergence in the nomination process. In some circumstances it is only the median voter in the left wing party that elects a more moderate candidate. In other instances the median voters of both parties' electorate nominate more "conservative" candidates, but there is still convergence. Furthermore, we show that a higher probability of the left winning the election increases the degree of convergence, while a more globalized economy (increased capital mobility) reduces it.

1 Introductory Remarks

The worldwide integration of markets, or globalisation as it is commonly known, is without a doubt the economic phenomenon that in recent years has received the most attention both in popular and in scholarly debates. In the industrialised countries, governments, domestic producers, and workers worry about the alledged consequences of globalisation: intensified competition from producers in low-wage countries, higher rates of immigration of unskilled workers, and capital transfers to countries where social standards are lower. For many observers, globalisation means a race to the bottom, with stronger competition across countries for markets and factors of production leading to lower levels of welfare benefits and public goods. For example, a great deal of attention has been devoted to studying whether increased capital mobility leads to an equilibrium with too low levels of taxation and provision of public goods because governments try to outbid each other in terms of taxation in an effort to attract or retain footloose capital.

*Foundation for Research in Economics and Business Administration, Breiviksveien 40, 5045, Bergen, Norway.

†Department of Economics, University of Bergen.

To assess whether the resulting cross-country equilibrium has tax rates which are "too low", one of course needs a normative benchmark. And indeed, in most of the literature on tax competion it is benevolent social planners which are in command of fiscal policies. However, to investigate whether greater mobility of capital will actually lead to reductions in the taxation of capital income, one needs a positive model of policy-making. Persson and Tabellini (1992) find that the outcome is not given. On the one hand, greater capital mobility does create a tendency towards lower tax rates because capital becomes more sensitive to fiscal policy abroad. On the other hand, since domestic policymakers do not care about the welfare of foreign owners of capital, in a non-symmetric non-cooperative equilibrium taxation according to the source principle creates incentives to have a tax rate in the capital importing (exporting) country which is higher (lower) than in the cooperative equilibrium. In a symmetric equilibrium, foreign net investment is zero in both countries. Then the median voters both home and abroad optimally elect representatives who care more about redistribution than themselves in order to alleviate the ensuing tax competition between governments. In a non-symmetric equilibrium, the consequences for the political outcome in the capital importing country are ambiguous because then the incentive to tax foreign owners of capital pulls the choice of the optimal delegate in the opposite direction. All in all they conclude that the political and economic effects of greater capital mobility tend to offset each other.

We contribute to the positive literature on the political economy of increased capital mobility in terms of both the economics and the politics. With respect to the economics, we study the effects of irreversible investments in capital. Irreversibility is a more realistic assumption when it comes to physical capital. It magnifies the consequences of future policies for current investment choices, which could mean that the incentives to reduce rates of capital taxation would be even stronger than in models where investment is completely reversible. With respect to the politics, we investigate competition between parties, which is of course what national politics is all about in the real world. In our model there are two political parties, with the left-wing party (L) preferring more public consumption and higher taxes than the right-wing party (R) it competes against. We study a process where the members of both parties nominate their prime ministerial candidates in the current period, while the election is to be held in the next period. We also add another realistic feature of national elections: uncertainty about the outcome of them. Electoral uncertainty means uncertainty about future tax rates, and this creates an option value of postponing investment in irreversible capital until after the uncertainty has been cleared.

Within this setting we study two different cases. In the first case, the election of a left-wing government implies higher taxes than the status quo, while the election of a right wing government implies lower taxes. In this situation it is only the second period policy of the L-party that affects current domestic investment. Turning to the current period, in which parties elect prime ministerial candidates, we show that it is optimal for the median member of the L-party to nominate a candidate that prefers less public consumption and lower taxes than she herself does. The median member of the R-party, on the other hand, has no reason for nominating a candidate with a different ideology than her own. This then implies that there is political convergence in this case. We show that a higher probability of L winning the election increases the degree of convergence, while a more globalized economy (increased capital mobility) reduces it. This means that, perhaps contrary to popular belief, globalisation might actually generate policy divergence, and not convergence, between left and right in the political landscape.

In the second case we study a situation where both parties, both L and R, will increase taxation compared to the status quo, but the left-wing government still prefers more public consumption and higher taxes than the right-wing party. In this case the candidates of both parties affect current investments, and both parties will nominate more "conservative" candidates. In this case too there is policy convergence, and the degree of convergence is lower the higher the degree of capital mobility; globalisation leads to policy divergence.

The rest of this paper is organised as follows. In the next section we present the model, and solve for optimal investments given the tax rates investors expect for the second period. In section 3 we find the second period tax rates different candidates would choose, in equilibrium, if they were elected into office. In section 4 we study the optimal choice of prime ministerial candidates by party members that take into consideration how the outcome of this election affect investments and their own welfare. Section 5 concludes.

2 The Model

2.1 Preferences and timing

Consider a world where there is a democratic country inhabited by a continuum of voters-investors who are to elect a government which is going to decide the level of capital taxation in the second of two periods. The proceeds of the tax are used to supply a public good. The value attached to public goods consumption differs among members of the electorate, who are assumed to be identical economically. Thus, there is political conflict over the size of the public sector. The preferences of a generic citizen of the country under investigation are

$$U^i = c + \gamma^i u(g), \tag{1}$$

where c and g are private and public consumption, respectively, $u(g)$ is an increasing and strictly concave function, and $\gamma^i > 0\ \forall i$.

There are two political parties, L and R, with associated sets of non-overlapping memberships M^L and M^R. We assume that the median value of γ amongst members of L, γ^λ, is higher than the corresponding figure in the R-party, γ^ρ.[1]

[1]Further restrictions required to generate the two types of equilibria discussed below are derived in the appendix.

The position taken by the government on fiscal policy is assumed to be identical to the optimal policy of the prime minister of the party which wins the election. The prime ministerial candidates of the two parties are elected simultaneously by the respective members at the beginning of period 1. Thereafter investors decide how much to invest at home and how much to invest abroad. Elections are held at the end of period 1. At the beginning of period 2, the new government chooses a tax policy and a corresponding level of supply of the public good. Investors then decide how to allocate the returns to their period 1 investments between investment at home and investment at broad. Finally, the returns to period 2 investment are realised, taxes are collected, and private and public consumption take place.

Note that we ignore the choice of period 1 policies in order to focus on the effects of future economic policies when investment at home is irreversible, which in turn has repercussions for the optimal political delegation of policy made by party members. We need two periods to be able to study irreversibility, but wish to avoid dealing with the strategic issues that arise when period 1 policies are purposively chosen. For the same reasons we do not allow the government to transfer resources across periods.[2] However, we include a period 1 tax rate because optimal investment is affected by it. Thus, implicitly setting it to zero by leaving it out would not have neutral effects on investors' decisions. Ignoring the corresponding level of public goods consumption is innocuous in our model,[3] and we simplify by assuming that there is no private consumption in period 1. This excludes considerations of optimal private savings and leaves only the issues that we are interested in shedding light on, namely, optimal political delegation when there is political uncertainty and investment is irreversible and how changes in the degree of capital mobility affect domestic politics. It turns out that our stylised model still yields many insights into the complex interactions between economics and politics in a world where capital markets are increasingly integrated.

2.2 Optimal period 2 decisions

Let k_t and f_t denote the capital invested at home and abroad in period t, respectively. Since all citizens are alike in terms of their economic characteristics, we may study the decisionmaking of a representative investor. He enters period 1 with a given endowment, E, which he allocates optimally between k_1 and f_1 given the tax rate in period 1, τ_1, and his expectations of the rate of taxation of

[2] The strategic use of public debt in a context where the identity of the public decision-maker might change over time has been much studied; see e.g. Persson and Svensson (1989), Alesina and Tabellini (1990), or Milesi-Ferretti (1995).

[3] Our assumptions might also be justified by the observation that fiscal policy is not adjusted every day. To an increasing extent, the fiscal expenditures of OECD-countries are tied up by past decisions on transfers and other welfare benefits which citizens have a legal entitlement to (see e.g. Alesina and Perotti 1995 and OECD 1995). Thus, in the short-run taxation (and borrowing) is more or less fixed by the current claims made by the public.

k_2.[4] Investment at home yields returns according to the increasing and strictly concave function $H(k_t)$. This investment is assumed to be irreversible. That is, we must have $k_{t+1} \geq k_t$ (for simplicity, depreciation is ignored). The net returns to investing abroad are $\nu_t = r_t - \mu_t$, where r_t are the gross returns and μ_t is the cost of making investments abroad.[5]

Optimal investment in the second period.

Let k_1^* be the amount of capital invested in domestic production in the first period. In the second period the investors choose optimal investment after the the identity of the new government and thus the tax rate is known. Given the resources available for reinvesting, $N_1(k_1^*) = H(k_1^*) - \tau_1 k_1^* + (1+\nu_1)(E - k_1^*)$, investors maximise their returns subject to the tax rate chosen by a government of type j, τ_2^j, and the irreversibility constraint:

$$Max\ H(k_2) - \tau_2^j k_2 + (1+\nu_2)\left[N_1(k_1^*) - (k_2 - k_1^*)\right]\ s.t.\ k_2 \geq k_1^*. \quad (2)$$

This problem has two possible solutions. The first is a corner solution where the irreversibility constraint binds, which means that $k_2^* = k_1^*$, and the second is an interior solution where $k_2^* > k_1^*$ solves[6]

$$H'(k_2^*) - \tau_2^j = 1 + \nu_2. \quad (3)$$

The critical second period tax rate that sets apart the corner solution and the interior solution is denoted by $\overline{\tau}_2$, where $\overline{\tau}_2$ solves $H'(k_1^*) - \overline{\tau}_2 \equiv 1 + \nu_2$. For $\tau_2 \geq \overline{\tau}_2$ the irreversibility constraint binds and $k_2^* = k_1^*$, whereas for $\tau_2 < \overline{\tau}_2$ the solution is interior and optimal investment is given by (3).

From now on we assume that $H(k) = \ln k$. Given an interior solution, the explicit value for the optimal capital stock at home when $j = L, R$ is in power in period 2 is

$$k_2^*(j) = \frac{1}{1 + \nu_2 + \tau_2^j}. \quad (4)$$

Under this assumption, we have an explicit expression for $\overline{\tau}_2$ too: $\overline{\tau}_2 = \frac{1}{k_1^*} - (1 + \nu_2)$.

This means that the Laffer-curve in period 2 has a linear portion:

---

[4]We assume that the source principle applies. Hence, the returns to investment abroad are not taxed by the home country. As noted by Persson and Tabellini (1992), the source principle is the system relevant for the corporate income tax in Europe. We also assume that the country under scrutiny does not import capital.

[5]Hence, μ_t covers the transactions costs caused by agency problems abroad. Arguably, the direct costs of moral hazard and adverse selection in foreign investment and the indirect costs of mitigating these problems are much higher than the transactions costs associated with the transfer of funds. Therefore, we ignore the small costs associated with repatriating the returns to investments abroad in order to consume them.

[6]In this paper, derivatives of functions $Z(x)$ of a single argument will be denoted by $Z'(x)$, whereas for functions of several variables $Z(x,y)$ partial derivatives will be written as $\frac{\partial Z(x,y)}{\partial x}$.

$$\tau_2 k_2^*(j) = \begin{cases} \frac{\tau_2}{1+\nu_2+\tau_2^j}, \tau_2 < \overline{\tau}_2; \\ \tau_2 k_1^*, \tau_2 \geq \overline{\tau}_2. \end{cases} \quad (5)$$

Optimal policy in the second period
A period 2 government of type j is to maximise

$$c_2(\tau_2) + \gamma^j u(g_2) \quad (6)$$

subject to $c_2(\tau_2) = H(k_2^*(j)) - \tau_2^j k_2^*(j) + (1+\nu_2)[N_1(k_1^*) - (k_2^*(j) - k_1^*)]$ and $g_2 \leq \tau_2 k_2^*(j)$. Denote the Lagrangian multiplier associated with the public sector budget constraint by η. Setting up the Lagrangian, we find that at an "interior" solution, i.e., when a government of type j finds it optimal to choose $\tau_2^j < \overline{\tau}_2$, the following three first-order conditions must be satisfied:

$$\eta^{j*}\left[k_2^*(j) + \tau_2^{j*}\frac{\partial k_2^*(j)}{\partial \tau_2}\right] = k_2^*(j); \quad (7a)$$

$$\gamma^j u'(g_2^{j*}) = \eta^{j*}; \quad (7b)$$

$$\tau_2^{j*} k_2^*(j) = g_2^{j*}. \quad (7c)$$

We will also assume that the utility function for public consumption is of the following form: $u(G_2) = \ln G_2$. Then the solution is

$$\eta^{j*} = (1+\gamma^j) > 1; \quad (8a)$$

$$g_2^{j*} = \frac{\gamma^j}{1+\gamma^j}; \quad (8b)$$

$$\tau_2^{j*} = \gamma^j(1+\nu_2). \quad (8c)$$

Unsurprisingly, all variables are increasing in γ^j.

If we are at a "corner solution" - that is, if it is optimal for a government of type j to choose $\tau_2^j < \overline{\tau}_2$ - we are at the linear portion of the Laffer-curve and the optimal values of the choice variables are[7]

$$\eta = 1; \quad (9a)$$

$$g_2^{j*} = \gamma^j; \quad (9b)$$

$$\tau_2^{j*} = \frac{\gamma^j}{k_1^*}. \quad (9c)$$

[7]It can be shown that the second-order conditions for an optimum are satisfied both in this case and in the previous one.

Note that in this case, the marginal cost of public funds is unity at the optimum. This is because at the optimum, the tax rate is so high that the irreversibility constraint is binding. Hence, marginal tax revenues are constant and equal to the marginal loss of private income. Also note that τ_2^{j*} is inversely related to k_1^* in this optimum.

2.3 Optimal investment in period 1

Let p be the probability that a government of type j is elected in period 2. Going back to the first period, the decision problem of investors is to maximise the expected returns to period 1 investment,

$$p\left\{H(k_2^*(L)) - \tau_2^{L*}k_2^*(L) + (1+\nu_2)\left[N_1(k_1) - (k_2^*(L) - k_1)\right]\right\} +$$
$$(1-p)\left\{H(k_2^*(R)) - \tau_2^{R*}k_2^*(R) + (1+\nu_2)\left[N_1(k_1) - (k_2^*(R) - k_1)\right]\right\},$$

subject to the resource constraint $E = k_1 + f_1$ and taking the period 2 tax rates (and thus aggregate investment at home in period 2) as given.[8] To solve this problem, we must consider the various possible configurations of tax rates in period 2.

There are three possible cases. First, we might have a configuration where $\tau_2^{L*} \geq \overline{\tau}_2 > \tau_2^{R*}$. Note that this case arises if, relative to the level prevailing in period 1, the $L-$party wants to increase public expenditures while the $R-$party wants to reduce public spending. That is, this regime occurs if $\tau_2^{L*} > \tau_1 > \tau_2^{R*}$. In this case the left wing party chooses a second period tax-rate on the linear part of the Laffer curve, while the $R-$party chooses a tax rate on the concave part. In case 2 both parties want to increase taxation in period 2, we might then have a configuration where $\tau_2^{L*} > \tau_2^{R*} \geq \overline{\tau}_2$. In this case both parties choose a tax rate on the linear portion of the Laffer curve in the second period. In the third case both types of governments want to implement tax rates that are lower than $\overline{\tau}_2$. Consequentially, the irreversibility constraint does not bind for any of the two types and optimal first period investments solve $H'(k_1^*) = \tau_1 + \nu_1$. We ignore this case, simply because this is a standard investment problem, and there is no link between second period policy and first period investment.

Let us first consider the instance where $\tau_2^{L*} \geq \overline{\tau}_2 > \tau_2^{R*}$. This is the case where the irreversibility constraint binds only if the $L-$government is elected in the second period. Hence, $k_2^*(L) = k_1$. Adjusting the maximisation problem of the representative investor to take this into account, we find that the first-order condition is[9]

$$p\left[H'(k_1^*) - \tau_2^{L*} + (1+\nu_2)N'(k_1^*)\right] + (1-p)(1+\nu_2)\left[N'(k_1^*) + 1\right] = 0. \quad (10)$$

The corresponding optimal level of first period investment is

[8] For simplicity, discounting of future returns is ignored.

[9] It is readily demonstrated that the second-order condition is satisfied both in this case and in the next one.

$$k_1^* = \frac{p + (1 + \nu_2)}{p\tau_2^{L*} + (1 + \nu_2)(\tau_1 + \nu_1 + p)}. \tag{11}$$

First note that the tax rate chosen by a period 2 government of type R does not enter the expression. This is because if that regime is realised, by assumption the tax rate will be set so that the irreversibility constraint is not binding. Then the marginal rate of return to period 2 investment is independent of the allocation of resources to investment at home and abroad in period 1 and is equal to $1 + \nu_2$. We see that k_1^* is a negative function of τ_2^L since a higher level of τ_2^L leads to lower marginal returns on the capital that is locked in at home in period 2 if an L-government wins the election.

The comparative statics of optimal first period investment with respect to taxes and net returns on foreign financial investments are intuitive; first period investments decreases if τ_1, ν_1 or ν_2 increases. It is also easy to show that $\frac{\partial k_1^*}{\partial p} < 0$ when $\tau_2^{L*} \geq \overline{\tau}_2$. Hence a higher probability of L being in power in period 2 reduces period 1 investment, as one would expect.

Next, consider the instance where $\tau_2^{L*} > \tau_2^{R*} \geq \overline{\tau}_2$. In this case the irreversibility constraint binds whichever government is elected in the second period; $k_2^*(j) = k_1^*$ for $j = L, R$. Then the first-order condition for optimal investment becomes

$$p\left[H'(k_1^*) - \tau_2^{L*} + (1 + \nu_2) N'(k_1^*)\right] + (1 - p)\left[H'(k_1^*) - \tau_2^{R*} + (1 + \nu_2) N'(k_1^*)\right] = 0. \tag{12}$$

Solving for k_1^* yields

$$k_1^* = \frac{1 + (1 + \nu_2)}{\tau_2^e + (1 + \nu_2)\left[\tau_1 + (1 + \nu_1)\right]}, \tag{13}$$

where $\tau_2^e = p\tau_2^{L*} + (1 - p)\tau_2^{R*}$ is the expected period 2 tax rate. In this case, of course, since both possible period 2 tax rates matter to investors, they will in general be concerned with the internal politics of both parties (the choice of γ^L and γ^R) as well as electoral politics (p). It is easily confirmed that the derivatives of first period investment with respect to τ_2^e, τ_1, p, ν_1, and ν_2 are all negative.[10] We now turn to deriving the equilibrium levels of k_1^*, τ_2^{L*}, and τ_2^{R*} for a given level of p.

3 Investment and tax rates in policy equilibrium

In the last section, optimal first period investment was derived given the expectations of investors of period 2 tax rates. Since this decision is made after

[10] $\frac{\partial k_1^*}{\partial p} < 0$ if and only if $\tau_2^L > \tau_2^R$. Below we will show that this is indeed the case in the political equilibrium.

the two parties have chosen their prime ministerial candidates, investors know what the optimal period 2 tax rates of possible future governments are. Still, in cases where $\tau_2^j \geq \overline{\tau}_2$ for at least one j, at least one period 2 tax rate is a function of aggregate investment in period 1 while the latter is a function of the former. Hence we must check for consistency. Given the explicit solutions we have derived, this is fairly easy. Take case 1, $\tau_2^{L*} \geq \overline{\tau}_2 > \tau_2^{R*}$, first. Then it is only the period 2 tax rate of an L-government that needs to be consistent with aggregate period 1 investment. Inserting (11) in (9c) yields

$$\widehat{\tau}_2^L = \frac{\gamma^L (1+\nu_2)(\tau_1 + \nu_1 + p)}{(1-\gamma^L)\, p + (1+\nu_2)} \tag{14}$$

where the hat is used to denote the equilibrium level of a variable. In turn, using this expression in (11) allows us to derive an explicit solution for the equilibrium investment level in period 1.

$$\widehat{k}_1 = \frac{(1-\gamma^L)\, p + (1+\nu_2)}{(1+\nu_2)(\tau_1 + \nu_1 + p)}. \tag{15}$$

Note that these are solutions in what we shall call the policy equilibrium. Since we have not studied the political choice of candidates for the two parties, this is not the full equilibrium of the model. Thus, both (14) and (15) contain an endogenous variable, γ^L.[11] Likewise, $\widehat{\tau}_2^R$, which is simply equal to $\gamma^R (1+\nu_2)$ in this case, is a function of γ^R, which is a choice variable of party R. Optimal values of γ^L and γ^R are derived in the next section.

$\widehat{\tau}_2^R$ is increasing in γ^R as well as in ν_2. Similarly, $\widehat{\tau}_2^L$ is an increasing function of γ^L as well as all the parameters of the model. Given the inverse relationship between period 1 investment and the period 2 tax rate of an L-government that exists in this case, $\widehat{k}_1$ is therefore a negative function of γ^L and all of the parameters. Note in particular that this means that only the politics of the L-party matter for $\widehat{k}_1$, and that the greater the probability of having a prime minister from L in period 2, the lower is investment in the policy equilibrium.

In the second case, that of $\tau_2^{L*} > \tau_2^{R*} \geq \overline{\tau}_2$, $\tau_2^{j*} = \frac{\gamma^j}{k_1^*}$, $j = L, R$. Substituting (13) into these expressions, we have τ_2^j as a function of the expected tax rate τ_2^e. Then the easiest way to proceed is to solve for τ_2^e. Doing this in turn allows us to derive $\widehat{\tau}_2^j$:

$$\widehat{\tau}_2^j = \frac{\gamma^j (1+\nu_2)\left[\tau_1 + (1+\nu_1)\right]}{1 + (1+\nu_2) - \left[p\gamma^L + (1-p)\,\gamma^R\right]}; j = L, R. \tag{16}$$

We see that as long as $\gamma^L > \gamma^R$, $\widehat{\tau}_2^L > \widehat{\tau}_2^R$. In other words, unless the politics of the two prime ministerial candidates become indistinguishable, party L will

[11] In future revisions of the paper, we aim to endogenise p too.

have a higher equilibrium tax rate in period 2. Now we find that in the policy equilibrium

$$\widehat{k}_1 = \frac{1 + (1 + \nu_2) - \left[p\gamma^L + (1-p)\,\gamma^R\right]}{(1+\nu_2)\left[\tau_1 + (1+\nu_1)\right]}. \tag{17}$$

The comparative statics are similar to those in case 1, except, of course, that in equilibrium both possible tax rates depend on the identity of both potential prime ministerial candidates. More left-leaning candidates from either party leads to higher tax rates for both parties. That is, not only will choosing a candidate for L which values public consumption more result in a higher level of $\widehat{\tau}_2^L$, it will also mean that $\widehat{\tau}_2^R$ will be higher, and vice versa. This is not only because such prime ministers will choose higher tax rates. The higher expected tax rate lowers the optimal level of investment in period 1 and so result in a smaller tax base, which adds some to the optimal period 2 tax rate as well. In this case, therefore, in the policy equilibrium $\widehat{k}_1$ is a decreasing function of both γ^L and γ^R. We now turn to the political equilibrium to see how the parties optimally choose their candidates taking into account how the ideology of their candidate affects the economy.

4 Political equilibrium for a given p

4.1 The case of $\tau_2^{L*} \geq \overline{\tau}_2 > \tau_2^{R*}$

Let m_b be a generic member of party b. We want to study the optimal choice of prime ministerial candidates by party members who are knowledgeable about the consequences for the economy, and thus for their own expected welfare. We assume that the primary elections of the two parties are staged simultaneously so that members of each party take the choice of the members of the other party as given when making up their own minds. As previously mentioned, they play the role of Stackleberg leaders with respect to private investors.

Consider first the case when the outcome is an equilibrium in which $\widehat{\tau}_2^L \geq \overline{\tau}_2 > \widehat{\tau}_2^R$. Then $\widehat{\tau}_2^L$ and $\widehat{k}_1$ are functions of γ^L only, while $\widehat{\tau}_2^R$ is only a function of γ^R. This means that the utility of m_b when an L-government is in power in period 2 is solely dependent on the ideology of that party's prime minister (γ^L), while her utility under an R-government is affected by the political standing of the candidates of both parties; second period policy is chosen by the R–party, while first period investment is influenced by the candidate nominated by the L–party. Given the policy equilibrium that is assumed to be realised, the utility of m_b when a government of type L is in power in period 2 may thus be written as $V^{m_b}(L) \equiv U^{m_b}\left(c\left(\widehat{\tau}_2^L\left(\gamma^L\right), \widehat{k}_1\left(\gamma^L\right)\right), \widehat{g}^L\left(\gamma^L\right)\right)$ and under an R-government $V^{m_b}(R) \equiv U^{m_b}\left(c\left(\widehat{\tau}_2^R\left(\gamma^R\right), \widehat{k}_1\left(\gamma^L\right)\right), \widehat{g}^R\left(\gamma^R\right)\right)$.[12] Expected utility is of course $E_j\left[V^{m_b}(j)\right] = pV^{m_b}(L) + (1-p)\,V^{m_b}(R)$.

[12] Because the optimal levels of provision of public goods in period 2 do not depend on period

We start by looking at the optimal prime ministerial candidate from the point of view of a member of party L. The derivatives of $V^{m_L}(L)$ and $V^{m_L}(R)$ with respect to γ^L, using the fact that $\widehat{g}^L(\gamma^L) = \widehat{\tau}_2^L(\gamma^L)\widehat{k}_1(\gamma^L)$, are[13]

$$\begin{aligned}\frac{\partial V^{m_L}(L)}{\partial \gamma^L} &= \left[H' - \widehat{\tau}_2^L + (1+\nu_2)N'\right]\frac{\partial \widehat{k}_1}{\partial \gamma^L} - \frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 \qquad (18a)\\ &\quad + \gamma^{m_L} u'\left(\frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 + \widehat{\tau}_2^L \frac{\partial \widehat{k}_1}{\partial \gamma^L}\right);\\ \frac{\partial V^{m_L}(R)}{\partial \gamma^L} &= (1+\nu_2)\left[N'+1\right]\frac{\partial \widehat{k}_1}{\partial \gamma^L}. \qquad (18b)\end{aligned}$$

In this case, $u'(\widehat{g}^L) = \frac{1}{\gamma^L}$. Therefore, the derivative of the expected utility of m_L with respect to the weight placed by the prime ministerial candidate of his party on the utility of public consumption may be written as

$$\begin{aligned}\frac{\partial E_j\left[V^{m_L}(j)\right]}{\partial \gamma^L} &= \left[p\left(H' - \widehat{\tau}_2^L\right) + (1-p)(1+\nu_2) + (1+\nu_2)N'\right]\frac{\partial \widehat{k}_1}{\partial \gamma^L} \qquad (19)\\ &\quad + p\left[\frac{\gamma^{m_L}}{\gamma^{L*}}\left(\frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 + \widehat{\tau}_2^L\frac{\partial \widehat{k}_1}{\partial \gamma^L}\right) - \frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1\right]\end{aligned}$$

However, the expression in square brackets preceeding $\frac{\partial \widehat{k}_1}{\partial \gamma^L}$ is zero at the optimum for first period investment (c.f. (10)). Therefore, at the optimum, where $\frac{\partial E_j[V^{m_L}(j)]}{\partial \gamma^L} = 0$, $\left(\frac{\gamma^{m_L}}{\gamma^{L*}} - 1\right)\frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 + \frac{\gamma^{m_L}}{\gamma^{L*}}\widehat{\tau}_2^L\frac{\partial \widehat{k}_1}{\partial \gamma^L} = 0$.[14] The first term is the marginal change in utility caused by choosing a delegate who has preferences different from one's own, which leads to an inoptimal level of public goods in period 2. It is zero when $\gamma^L = \gamma^{m_L}$, and since $\frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L} > 0$, it is positive (negative) when $\gamma^L < \gamma^{m_L}$ ($\gamma^L > \gamma^{m_L}$): whether γ^L is above or below γ^{m_L}, m_L gains if the identity of the delegate moves in the direction of her own ideology. The second term is the effect of marginal changes in the ideology of a potential prime minister from L on equilibrium investment at home in period 1. Because the political uncertainty surrounding period 2 tax rates works like a distortion of this investment, there is a gain from lowering γ^L ($\frac{\partial \widehat{k}_1}{\partial \gamma^L} < 0$). Clearly, then, if the sum of these terms is to be zero, the first term must be positive. That is, the solution entails $\gamma^{L*} < \gamma^{m_L}$. This is indeed the case:

1 investment, $\widehat{g}^R(\gamma^R)$ and $\widehat{g}^L(\gamma^L)$ are identical to the functions derived in (8*b*) and (9*b*), respectively. The notation is changed only to be consistent with that used for the equilibrium tax rates and investment at home in the first period.

[13]For the sake of brevity, functional arguments are omitted.

[14]Also note that this means that what happens under an R-government has no bearing on the internal politics of party L.

$$\gamma^{L*}(\gamma^{m_L}) = \left[\frac{p + (1+\nu_2)}{(1+\gamma^{m_L})\,p + (1+\nu_2)}\right]\gamma^{m_L} \tag{20}$$

The comparative statics with respect to p, ν_2, and γ^{m_L} are as follows:

$$\frac{\partial \gamma^{L*}(\gamma^{m_L})}{\partial \gamma^{m_L}} = \left[\frac{p + (1+\nu_2)}{(1+\gamma^{m_L})\,p + (1+\nu_2)}\right]^2 > 0; \tag{21a}$$

$$\frac{\partial \gamma^{L*}(\gamma^{m_L})}{\partial p} = -\left[\frac{\gamma^{m_L}}{(1+\gamma^{m_L})\,p + (1+\nu_2)}\right]^2 (1+\nu_2) < 0; \tag{21b}$$

$$\frac{\partial \gamma^{L*}(\gamma^{m_L})}{\partial \nu_2} = p\left[\frac{\gamma^{m_L}}{(1+\gamma^{m_L})\,p + (1+\nu_2)}\right]^2 > 0. \tag{21c}$$

The first result is the most important one: it demonstrates that the ideology of the optimal delegate of m_L is monotonically increasing in the weight she attaches to the utility of public goods. Therefore, there is a unique optimal prime minister from her point view. In other words, her preferences over possible delegates are single-peaked. In turn, this means that it is the median member of L, which we denote by λ, that determines the candidate which the party will be fielding in the general elections.[15]

(21*b*) and (21*c*) show that the optimal choice of γ^L is decreasing in p and increasing in ν_2. The intuition is best grasped by rewriting $\left(\frac{\gamma^{m_L}}{\gamma^L} - 1\right)\frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 + \frac{\gamma^{m_L}}{\gamma^L}\widehat{\tau}_2^L\frac{\partial \widehat{k}_1}{\partial \gamma^L} = 0$ as $\frac{\gamma^{m_L}}{\gamma^L} - \epsilon_{\gamma^L}^{\widehat{\tau}_2^L} = 0$, where $\epsilon_{\gamma^L}^{\widehat{\tau}_2^L} > 1$ is the equilibrium elasticity of the period 2 tax rate of party L with respect to the weight attached to public consumption. It is readily derived from (14), and is increasing in p and decreasing in ν_2. That is, at higher levels of p (ν_2), $\widehat{\tau}_2^L$ is more (less) sensitive to changes in the policy preferences of the party's prime minister, and so it is optimal for λ to deviate less (more) from her own ideology. Intuitively, when the probability that L wins is higher, investors react more strongly to the policy that the party will pursue after the election, and this encourages the median member in L to elect a more moderate candidate.. On the other hand, in the equilibrium studied here period 1 investment is smaller when ν_2 is higher, and so less is at stake for private investors who therefore become less concerned with the policy in the high tax regime.[16] This allows party members to elect a candidate who is closer to their own ideology. In other words, greater capital mobility leaves the leftist party with more political room to manoeuvre, not less!

[15] To be precise: since we have a continuum of party members, it is the median set of party members which determine the policy stance of the party's candidate.

[16] These interpretations might alternatively be surmised by noting that as $\widehat{\tau}_2^L = \frac{\gamma^L}{\widehat{k}_1}$, $\epsilon_{\gamma^L}^{\widehat{\tau}_2^L} = 1 - \epsilon_{\gamma^L}^{\widehat{k}_1}$. Thus, the comparative statics of changes in parameter values on γ^{L*} works through $\epsilon_{\gamma^L}^{\widehat{k}_1}$.

The choice of a prime ministerial candidate is easier for members of party R. The counterparts of (21b) and (21c) are[17]

$$\frac{\partial V^{m_R}(L)}{\partial \gamma^R} = 0; \tag{22a}$$

$$\frac{\partial V^{m_R}(R)}{\partial \gamma^R} = \left[H' - \widehat{\tau}_2^R - (1+\nu_2)\right] \frac{\partial \widehat{k}_2(R)}{\partial \gamma^R} - \frac{\partial \widehat{\tau}_2^R}{\partial \gamma^R}\widehat{k}_2(R) + \gamma^{m_R} u' \left(\frac{\partial \widehat{\tau}_2^R}{\partial \gamma^R}\widehat{k}_2(R) + \widehat{\tau}_2^R \frac{\partial \widehat{k}_2(R)}{\partial \gamma^R} \right). \tag{22b}$$

Adjusting the policy stance of the candidate of party R does not affect $\widehat{k}_1$ in the current case. Thus, it has no impact on the optimal period 2 policy of the other party either, and consequently no effects at all on outcomes if L comes to power. It follows that at the optimum, $\frac{\partial V^{m_R}(R)}{\partial \gamma^R} = 0$. But clearly there is no reason for a member of party R to vote for someone whose preferences are different from her own. The period 2 tax policy of her party does not affect investment at home in the initial period as long as the equilibrium is of the type studied here. Consequently, the influence of the R-party's policy on the economy is restricted to the post-election judgment of the optimal size of the public relative to the private sector. Since the elasticity of the tax base at the optimum does not change between the periods from the perspective of party R, there is no problem of dynamic inconsistency, and hence no need to distort the choice of public consumption. That is, $\gamma^{R*} = \gamma^{m_R}$, $\forall m_R$. Hence, the chosen prime ministerial candidate of party R is the median party member, ρ.

This means that relative to a situation in which domestic investment in physical capital is not irreversible, in which case there there would be no reason in our model for the median member of either party to nominate someone with different preferences, there is partial convergence of ideological positions in equilibrium: $0 < \gamma^{L*} - \gamma^{R*} < \gamma^{\lambda} - \gamma^{\rho}$.[18] This is an interesting result. In the literature on party or candidate competition partial convergence, as opposed to complete convergence, occurs if politicians are policy-motivated and there is uncertainty about the preferences of voters.[19] These are the conditions that we have assumed here.[20] However, in the standard models, partial convergence, if

[17] Once again we use a hat over behavioural functions to ensure consistency of notation even though $\widehat{\tau}_2^R$ and $\widehat{k}_2(R)$ are identical to the functions τ_2^{R*} and $k_2^*(R)$ derived in sub-section 2.2.

[18] The second inequality, demonstrating convergence, follows directly from the results just derived. To have partial convergence instead of complete convergence, so that the first inequality is satisfied, we need the political distance between the median party members to be great enough. To be precise, we must have $\frac{\gamma^{\lambda}-\gamma^{\rho}}{\gamma^{\lambda}} > \left[\frac{p}{p+(1+\nu_2)}\right]\gamma^{\rho}$.

[19] A good discussion of these issues can be found in chapter 2 of Alesina and Rosenthal (1995).

[20] A third necessary condition to have partial convergence in a one-shot game of electoral competition is that parties can commit to policy platforms. If they cannot, there is no convergence in equilibrium because voters will realise that they will implement their most

it occurs, is due to parties trying to increase their probability of winning the election. That is, they trade off the loss from a more moderate platform and the gain from a higher probability of this platform, which is better than the opponents' as long as convergence is not complete, being realised. Here we hold the probability of winning the election constant, but the economics of the model still generate partial convergence.

As $\gamma^{R*} = \gamma^{\rho}$, a greater ideological difference between the median party members reduces the extent of convergence. More interestingly, a higher probability of L winning the election increases the degree of convergence while an increase in ν_2 reduces it. This means that, perhaps contrary to popular belief, globalisation might actually generate divergence, not convergence.

There is, however, a distinction in our model between preferences and policies which is absent in the standard models of electoral competition. These models are such that parties' bliss points are defined in the same space as the policy platforms. Here we derive optimal policies from the primitives, including preferences for public goods, which is the source of political conflict. Moreover, optimal period 2 policies might depend on private sector choices that in turn depend on these policies. Still, as long as we are in the same kind of equilibrium the fact $\gamma^{L*} - \gamma^{R*} < \gamma^{\lambda} - \gamma^{\rho}$ implies that $\widehat{\tau}_2^L - \widehat{\tau}_2^R$ is lower under delegation than if the median voters of each party were the candidates.[21] Interestingly, though, it does not imply that the sign of the derivative of $\widehat{\tau}_2^L - \widehat{\tau}_2^R$ with respect to ν_2 is the same as the derivative of $\gamma^{L*} - \gamma^{R*}$ with respect to this parameter. We have already found that the latter is positive. Because $\widehat{\tau}_2^R$ is increasing in ν_2, it turns out that the sign of the latter is ambiguous. Hence, while lower costs of moving capital across borders result in ideological divergence, the effect on differences in policy need not be in the same direction.

4.2 The case of $\tau_2^{L*} > \tau_2^{R*} \geq \overline{\tau}_2$

Turning to case 2, where the equilibrium has both possible period 2 tax rates above the critical level at which the irreversibility constraint binds for domestic investment in the first period, first note that the primary elections are now complicated by the fact that k_1^* is a function of the future policies of both parties. Therefore, the equilibrium level of first period investment at home depends on the indentities of both prime ministerial candidates (c.f. (17)). In turn, as shown in (16) this means that the choices of the members of L and R are interdependent in the sense that the ideology of L's candidate affects the optimal period 2 tax rate of R's candidate and vica versa.

preferred policies after the election. We do not assume that the parties can make binding campaign promises, but since we distinguish between parties and their candidates and allow the former to choose the latter, political actors in effect have a commitment device.

[21] $\widehat{\tau}_2^L - \widehat{\tau}_2^R$ under delegation is in this case found by inserting (20) in (14) and subtracting $\widehat{\tau}_2^R = \gamma^{\rho}(1 + \widetilde{\tau}_2)$. In the absence of delegation, when this is interpreted to mean that the parties are represented by their median members, $\widehat{\tau}_2^L - \widehat{\tau}_2^R$ is derived by replacing γ^L by γ^{λ} in (14) and subtracting $\gamma^{\rho}(1 + \widetilde{\tau}_2)$. One then finds that the former difference is less than the latter.

Using the period 1 first-order condition for the private sector (equation (12)) to simplify the first-order conditions for optimal delegates and writing these in terms of the elasticities of the equilibrium level of investment and period 2 tax rates, we have

$$\frac{\partial E_j\left[V^{m_L}(j)\right]}{\partial\gamma^L} = p\left[\frac{\gamma^{m_L}}{\gamma^{L*}}\left(\epsilon^{\hat{\tau}_2^L}_{\gamma^L}+\epsilon^{\hat{k}_1}_{\gamma^L}\right)-\epsilon^{\hat{\tau}_2^L}_{\gamma^L}\right] + (1-p)\frac{\gamma^{R*}}{\gamma^{L*}}\left[\frac{\gamma^{m_L}}{\gamma^{R*}}\left(\epsilon^{\hat{\tau}_2^R}_{\gamma^L}+\epsilon^{\hat{k}_1}_{\gamma^L}\right)-\epsilon^{\hat{\tau}_2^R}_{\gamma^L}\right]; \tag{23a}$$

$$\frac{\partial E_j\left[V^{m_R}(j)\right]}{\partial\gamma^R} = p\frac{\gamma^{L*}}{\gamma^{R*}}\left[\frac{\gamma^{m_R}}{\gamma^{L*}}\left(\epsilon^{\hat{\tau}_2^L}_{\gamma^R}+\epsilon^{\hat{k}_1}_{\gamma^R}\right)-\epsilon^{\hat{\tau}_2^L}_{\gamma^R}\right] + (1-p)\left[\frac{\gamma^{m_R}}{\gamma^{R*}}\left(\epsilon^{\hat{\tau}_2^R}_{\gamma^R}+\epsilon^{\hat{k}_1}_{\gamma^R}\right)-\epsilon^{\hat{\tau}_2^R}_{\gamma^R}\right]. \tag{23b}$$

These expressions are considerably simplified by the fact that $\epsilon^{\hat{\tau}_2^L}_{\gamma^L}+\epsilon^{\hat{k}_1}_{\gamma^L} = 1 = \epsilon^{\hat{\tau}_2^R}_{\gamma^R}+\epsilon^{\hat{k}_1}_{\gamma^R}$ and $\epsilon^{\hat{\tau}_2^R}_{\gamma^L}+\epsilon^{\hat{k}_1}_{\gamma^L} = 0 = \epsilon^{\hat{\tau}_2^L}_{\gamma^R}+\epsilon^{\hat{k}_1}_{\gamma^R}$, results which are readily confirmed starting from (16) and (17). Using these in (23*a*) and (23*b*) and equating the result with zero, one finds that in the Nash-equilibrium

$$\gamma^{L*}\left(\gamma^{m_L},\gamma^{R*}\right) = \left[\frac{1+(1+\nu_2)-(1-p)\gamma^{R*}}{1+(1+\nu_2)+p\gamma^{m_L}}\right]\gamma^{m_L}; \tag{24a}$$

$$\gamma^{R*}\left(\gamma^{L*},\gamma^{m_R}\right) = \left[\frac{1+(1+\nu_2)-p\gamma^{L*}}{1+(1+\nu_2)+(1-p)\gamma^{m_R}}\right]\gamma^{m_R}. \tag{24b}$$

As the policy stance of the optimal delegate is increasing in the weight a party member attaches to period 2 public consumption, the collective choice of each party is once again decided by the group of median party members. Therefore, we can solve for the optimal candidate chosen by λ given that $\gamma^{R*} = \gamma^{R*}\left(\gamma^{L*},\gamma^{\rho}\right)$ and the choice of ρ when $\gamma^{L*} = \gamma^{L*}\left(\gamma^{\lambda},\gamma^{R*}\right)$. The closed-form solutions are

$$\gamma^{L*}\left(\gamma^{\lambda},\gamma^{\rho}\right) = \left[\frac{1+(1+\nu_2)}{1+(1+\nu_2)+\left[p\gamma^{\lambda}+(1-p)\gamma^{\rho}\right]}\right]\gamma^{\lambda}; \tag{25a}$$

$$\gamma^{R*}\left(\gamma^{\lambda},\gamma^{\rho}\right) = \left[\frac{1+(1+\nu_2)}{1+(1+\nu_2)+\left[p\gamma^{\lambda}+(1-p)\gamma^{\rho}\right]}\right]\gamma^{\rho}. \tag{25b}$$

Now the members of both parties prefer delegates who are more "right-wing" than themselves to themselves; if we denote the decisive voter(s) of party b by d_b, we have found that $\gamma^{b*} < \gamma^{d_b}$, $b = L, R$. Note the interesting interdependency of the optimal choices: the more left-wing the median members of the other party are, the more "conservative" the optimal delegate of the median members of the other party is. That is, the higher the weight the median members of the other party attach to the consumption of public goods, the lower is the weight of the candidate elected by the other party. This is of course due to the fact that in this equilibrium, there is a negative externality from one party choosing a candidate favouring a larger public sector: equilibrium investment declines, causing a shift in the opposite direction in the other party to mitigate the negative impact on first period investment at home.

Because we may write (25*a*) and (25*b*) on the form $\gamma^{b*} = \psi\gamma^{d_b}$, it is clear that the comparative statics of γ^{L*} and γ^{R*} with respect to p and ν_2 are identical. The effect of an increase in the former "parameter" is negative as long as $\gamma^{\lambda} > \gamma^{\rho}$. A higher ν_2 means that a more left-wing candidate is optimal, so in this case as well greater capital mobility implies a higher expected level of taxation. The reason is also the same: the elasticity of the equilibrium level of first period investment with respect to the ideology of the candidates is lower when the returns to investing abroad are higher. Thus, the result is rather robust. When political conflict is over the size of the public sector, globalisation in the form of lower costs of moving capital abroad lead to more left-wing candidates being elected in equilibrium because the returns to capital at home means less to citizens when they have placed more of their wealth abroad.

On the issue of convergence, note that as $0 < \psi < 1$, $\gamma^{L*} - \gamma^{R*} = \psi\left(\gamma^{\lambda} - \gamma^{\rho}\right) < \gamma^{\lambda} - \gamma^{\rho}$. In plain text, in equilibrium there is partial convergence in terms of candidate ideology in this case as well.[22] Does globalisation lead to political convergence? Does it lead to to policy convergence? When the ideologies of the party members differ, the answers to both questions are no. Globalisation implies divergence in both senses. From $\gamma^{L*} - \gamma^{R*} = \psi\left(\gamma^{\lambda} - \gamma^{\rho}\right)$, the sign of $\frac{\partial\left(\gamma^{L*} - \gamma^{R*}\right)}{\partial \nu_2}$ can be seen to be the same as the sign of $\frac{\partial \psi}{\partial \nu_2}$, which we know is positive. Furthermore, inserting (25*a*) and (25*b*) in the corresponding versions of (16), one finds that $\widehat{\tau}_2^L - \widehat{\tau}_2^R = \xi\left(\gamma^{\lambda} - \gamma^{\rho}\right)$, where ξ is a function of ν_2 (as well as τ_1 and ν_1). It turns out to be a positive function of the marginal returns to investing abroad in period 2. In other words, greater capital mobility caused by lower transactions costs of investing in foreign lands leads to policy divergence as well.

5 Concluding Remarks

In the introduction, we noted that Persson and Tabellini (1992), whose analysis of capital mobility and the politics of fiscal policy is the only other study of these subjects that we are aware of, found a tendency for the economics and politics to work in opposite directions. Qualitatively, although derived from a quite different type of model, our results are in this vein. We have a model of party competition instead of a median voter model.[23] Furthermore, real investment at home is irreversible in our model, while they look at a standard investment

[22] As an aside, note that it is still the case that the possibility of delegation leads to policy convergence.

[23] Also, we study conflict over the size of the public sector while in their model citizens differ in wealth and therefore in the degree of public redistribution that they would like to see.

problem over two periods where there are no possibilities of reallocating investment.[24]

We found that in case 1, as the period 2 policies of their party did not affect the period 1 investment decisions, there was no reason for the median members of party R to choose a candidate with preferences different from their own. However, the L-party members had to take such a link into account and hence optimally chose a more "conservative" prime ministerial candidate. Therefore, there was convergence of ideological positions in equilibrium. Interestingly, as long as the ideologies of the median party members were sufficiently different, convergence was only partial. This is in contrast to formal models of electoral competition. In these models, partial convergence is the outcome of two-party competition when parties are both policy-motivated and unsure about voter preferences. These are the same assumptions that we make, but in contrast to these models partial convergence is not generated by the perceived possibility of increasing the probability of winning the election. We keep this probability constant. The difference is therefore entirely due to the economics of the model, namely, that there is a gain in terms of higher levels of domestic investment in period 1 if the L-party moderates its stance.

Our model also differs from formal political science models of electoral competition because we make an explicit distinction between preferences and policies, deriving the latter from the former. Therfore, we are able to analyse the convergence issue in policy space as well. Relative to a case where the candidates were randomly picked among the median party members, there was convergence in period 2 tax rates. The effect of greater capital mobility on convergence was ambiguous in terms of policies, but clear in terms of candidate ideologies. Contrary to what might be expected, lower costs of moving capital abroad lead to less convergence, not more. The reason was that the greater the degree of capital mobility, the greater the level of investment abroad. And when less is invested at home, investors become less concerned with home country politics. In other words, leftist parties have more leeway and use this to deviate less from their optimal mix of private and public consumption.

Hence, we find that globalisation does not seem to be such a stark constraint on national democratic politics as often seem to be assumed. Moreover, this result carries over to the case where both parties tax capital invested at home relatively heavily. Although the internal political processes of the parties then result in prime ministerial canidates whose ideology is to the right of their median party members, and there is convergence between the parties in terms of the political platform of the canidates they field in the national elections, greater capital mobility lessens these tendencies. It also reduces the degree of policy convergence. Within the confines of the model, the result is therefore fairly robust.

A further indication of robustness is provided by the conclusions of Garrett (1998). Being a political scientist, these are not derived from a formal model,

[24]These assumptions also set our model apart from that used by Persson and Tabellini (1994) to study the politics of capital taxation in direct versus representative democracies in autarky.

but from an empirical analysis of patterns of economic policies and performance in industrial democracies from the 1970s to the 1990s. The focus is also different. He is concerned with the viability of corporatist social democracy as a distinct political alternative in the context of globalisation. We take his argument that the evidence suggests that "redistributive government, powerful labor movements, and vibrant capitalism are mutually reinforcing" (p.157) to indicate that greater capital mobility has not vitiated national politics as an independent influence on economic outcomes. This is consistent with the results of out model.

Although we are confidence in the conclusions of our analysis, there are of course limitations to it. A crucial distinction between our model and that of Persson and Tabellini (1992) is that we do not consider policies and political processes abroad. We are not sure this is an empirical weakness of our model. While elected representatives as well as voters do consider the external conditions of the economy when making up their minds about which policies, candidates, or parties best further their interests, it is not clear (at least not in small countries) that they believe that their choices are taken into account abroad. Moreover, elections are not staged simultaneously in all countries, which is what Persson and Tabellini (1992) assume. Thus, even if one does want to model strategic interaction across borders, taking this fact into account in a one-shot game one would have to give the inhabitants of one country a first-mover advantage. This choice would unavoidably be arbitrary. On the other hand, a dynamic model would rapidly become very complex and thus one would need other simplifying assumptions in order to derive results.

As a first step, we will therefore extend our model in the future by endogenising the probability of party L winning the election. As should be clear from the discussion above, one consequence would be that the parties would have a further incentive to converge. But because the probability of L winning the election is also the probability that the regime with the highest tax rate will arise in period 2, there is also an effect on investment. This link will complicate matters for party L, which will increase the distortion of period 1 investment if it increases its probability of winning. Deriving the net results in terms of both economics and politics thus promises to be an interesting exercise that will shed further light on one of the most important topics of today: the constraints posed by the increasing international integration of markets on the policies pursued by nation states.

6 Appendix: Existence of Equilibria

In the main text, we derived optimal prime ministerial candidates for the two parties assuming that the equilibrium outcome had period 2 tax rates falling into either of two regimes, $\tau_2^L \geq \overline{\tau}_2 > \tau_2^R$ or $\tau_2^L > \tau_2^R \geq \overline{\tau}_2$. In this appendix, we prove that there exists configurations of the values of the parameters such that the outcomes of the internal political processes of the two parties are consistent with the assumption underpinning the derivation of the optimal prime ministerial candidates.

Starting with case 1, using the optimum values of γ^{L*} and γ^{R*}, we can derive the tax rates $\tilde{\tau}_2^L$ and $\tilde{\tau}_2^R$ and the cutoff rate $\tilde{\overline{\tau}}_2$ (we use a tilde to denote variables in the full equilibrium of the model, that is, including the nomination process of the two parties). In addition to $\gamma^\lambda > \gamma^\rho$, there are four conditions that need to be satisfied:

$$\begin{aligned} \tilde{\tau}_2^L &\geq \tilde{\overline{\tau}}_2; && \text{(A1a)} \\ \tilde{\tau}_2^L &\leq 1; && \text{(A1b)} \\ \tilde{\tau}_2^R &< \tilde{\overline{\tau}}_2; && \text{(A1c)} \\ \tilde{\tau}_2^R &\geq 0. && \text{(A1d)} \end{aligned}$$

Since $\tilde{\tau}_2^R = (1+\nu_2)\gamma^\rho$, all we need for $(A1d)$ to hold is $\gamma^\rho > 0$, which we already have assumed, so we do not need to investigate this condition further. Using (14), (15), (20), and $\tilde{\tau}_2^R = (1+\nu_2)\gamma^\rho$, the other three conditions may in turn be rewritten as

$$\begin{aligned} \gamma^\lambda &\geq \frac{[p+(1+\nu_2)]\,[\tau_1+\nu_1-(1+\nu_2)]}{(1+\nu_2)(\tau_1+\nu_1+p)} \equiv \underline{\gamma}^\lambda; && \text{(A2a)} \\ \gamma^\lambda &\leq \frac{p+(1+\nu_2)}{(1+\nu_2)(\tau_1+\nu_1+p)} \equiv \overline{\gamma}^\lambda; && \text{(A2b)} \\ \gamma^\rho &< \frac{p(\tau_1+\nu_1+p)}{[p+(1+\nu_2)]^2}\gamma^\lambda + \frac{\tau_1+\nu_1-(1+\nu_2)}{p+(1+\nu_2)}. && \text{(A2c)} \end{aligned}$$

Note that due to first period investment, and thus $\tilde{\overline{\tau}}_2$, being a function of the period 2 tax rate of the L-party, $(A2c)$ contains γ^λ. Because $\gamma^\rho > 0$, the right hand side of $(A2c)$ must be strictly greater than zero if the equilibrium is to be realised. $(A2c)$ is therefore also a condition on the size of γ^λ:

$$\gamma^\lambda > -\frac{[p+(1+\nu_2)]\,[\tau_1+\nu_1-(1+\nu_2)]}{p(\tau_1+\nu_1+p)} \equiv \underline{\underline{\gamma}}^\lambda. \qquad \text{(A3)}$$

For realistic parameter values, it is clearly the case that $\overline{\gamma}^\lambda > \underline{\gamma}^\lambda$. Thus, all we need is $\underline{\underline{\gamma}}^\lambda < \overline{\gamma}^\lambda$. The parameter configurations for which this condition holds turns out to be as simple as $\tau_1 + \nu_1 > (1+\nu_2) - p$. If this inequality applies, then for combinations of $\gamma^\lambda \in \left[Max\left\{\underline{\gamma}^\lambda, \underline{\underline{\gamma}}^\lambda\right\}, \overline{\gamma}^\lambda\right]$ and $\gamma^\rho \in \left(0, \frac{p(\tau_1+\nu_1+p)}{[p+(1+\nu_2)]^2}\gamma^\lambda + \frac{\tau_1+\nu_1-(1+\nu_2)}{p+(1+\nu_2)}\right)$, an equilibrium of the first type exists.[25]

Moving to the second case, we need the following to be true:

[25] To be completely correct, if $Max\left\{\underline{\gamma}^\lambda, \underline{\underline{\gamma}}^\lambda\right\} = \underline{\underline{\gamma}}^\lambda$, we need to have $\gamma^\lambda \in \left(Max\left\{\underline{\gamma}^\lambda, \underline{\underline{\gamma}}^\lambda\right\}, \overline{\gamma}^\lambda\right]$.

$$\tilde{\tau}_2^L \geq \tilde{\tilde{\tau}}_2; \quad \text{(A4a)}$$
$$\tilde{\tau}_2^L \leq 1; \quad \text{(A4b)}$$
$$\tilde{\tau}_2^R \geq \tilde{\tilde{\tau}}_2; \quad \text{(A4c)}$$
$$\tilde{\tau}_2^R \leq 1. \quad \text{(A4d)}$$

These conditions place the following restrictions on γ^λ and γ^ρ:

$$\begin{aligned}
\gamma^\lambda &\geq \left[\frac{1-p}{1-p+(1+\nu_2)}\right]\gamma^\rho - \frac{[1+(1+\nu_2)]\,[\tau_1+\nu_1-(1+\nu_2)]}{[1-p+(1+\nu_2)]\,(\tau_1+1+\nu_1)} \quad \text{(A5a)}\\
&\equiv \underline{\gamma}^\lambda\left(\gamma^\rho\right);\\
\gamma^\lambda &\leq \frac{1+(1+\nu_2)}{(1+\nu_2)\,(\tau_1+1+\nu_1)} \equiv \overline{\gamma}^\lambda; \quad \text{(A5b)}\\
\gamma^\rho &\geq \left[\frac{p}{p+(1+\nu_2)}\right]\gamma^\rho - \frac{[1+(1+\nu_2)]\,[\tau_1+\nu_1-(1+\nu_2)]}{[p+(1+\nu_2)]\,(\tau_1+1+\nu_1)} \quad \text{(A5c)}\\
&\equiv \underline{\gamma}^\rho\left(\gamma^\lambda\right);\\
\gamma^\rho &\leq \frac{1+(1+\nu_2)}{(1+\nu_2)\,(\tau_1+1+\nu_1)} \equiv \overline{\gamma}^\rho. \quad \text{(A5d)}
\end{aligned}$$

($A5b$) and ($A5d$) are the same because using γ^{L*} and γ^{R*} (from ($25a$) and ($25b$)) in (16), we get $\tilde{\tau}_2^L = \vartheta\gamma^\lambda$ and $\tilde{\tau}_2^R = \vartheta\gamma^\rho$. Of course, if these conditions are to be satisfied, we must have $\overline{\gamma}^\lambda \geq \underline{\gamma}^\lambda\left(\gamma^\rho\right)$ and $\overline{\gamma}^\rho \geq \underline{\gamma}^\rho\left(\gamma^\lambda\right)$. These requirements generate two more necessary conditions:

$$\begin{aligned}
\gamma^\lambda &\leq \frac{[1+(1+\nu_2)]\,\{(1+\nu_2)\,[\tau_1+\nu_1-(1+\nu_2)]+1-p+(1+\nu_2)\}}{(1-p)\,(\tau_1+1+\nu_1)\,(1+\nu_2)} \quad \text{(A6a)}\\
&\equiv \overline{\overline{\gamma}}^\lambda;\\
\gamma^\rho &\leq \frac{[1+(1+\nu_2)]\,\{(1+\nu_2)\,[\tau_1+\nu_1-(1+\nu_2)]+1-p+(1+\nu_2)\}}{p\,(\tau_1+1+\nu_1)\,(1+\nu_2)} \quad \text{(A6b)}\\
&\equiv \overline{\overline{\gamma}}^\rho
\end{aligned}$$

That is, if we pick a $\gamma^\lambda \in \left(0, \overline{\overline{\gamma}}^\lambda\right]$, there are values of γ^ρ satisfying ($A5c$) and ($A5d$). Similarly, for any $\gamma^\rho \in \left(0, \overline{\overline{\gamma}}^\rho\right]$, there are values of γ^λ satisfying ($A5a$) and ($A5b$). However, as ($A5a$)-($A5d$) must be satisfied simultaneously, $\gamma^\lambda \in \left(0, \overline{\overline{\gamma}}^\lambda\right]$ and $\gamma^\rho \in \left(0, \overline{\overline{\gamma}}^\rho\right]$ is not sufficient.

For any $\gamma^\rho \in \left(0, \overline{\overline{\gamma}}^\rho\right]$, let $\Gamma^L = \left\{\left\{\gamma^\lambda, \gamma^\rho\right\} \mid \gamma^\lambda \in \left[\underline{\gamma}^\lambda\left(\gamma^\rho\right), \overline{\gamma}^\lambda\right] \wedge \gamma^\rho \in \left(0, \overline{\overline{\gamma}}^\rho\right]\right\}$ and define Γ^R in the same way. These are the combinations of γ^λ and γ^ρ which satisfy ($A5a$)-($A5b$) and ($A5c$)-($A5d$), respectively. Then a necessary and sufficient condition for there to be combinations of γ^λ and γ^ρ satisfying all constraints, including $\gamma^\lambda > \gamma^\rho$, is $\Gamma^L \cap \Gamma^R \neq \emptyset$. It can be shown that $\Sigma^L \cap \Sigma^R \neq \emptyset$ if $\tau_1 + \nu_1 > \nu_2$.

7 References

Alesina, A. og R. Perotti (1995): "Fiscal Expansions and Adjustments in OECD Countries." *Economic Policy* No. 21: 205-248.

Alesina, A. and H. Rosenthal (1995): "Partisan Politics, Divided Government, and the Economy." Cambridge University Press.

Alesina, A. and G. Tabellini (1990). "A Positive Theory of Fiscal Deficits and Government Debt". *Review of Economic Studies* 57: 403-414.

Garrett, G. (1998): "Partisan Politics in the Global Economy." Cambridge University Press.

Milesi-Ferretti, G.M. (1995). "Do Good or Do Well? Public Debt Management in a Two-Party Economy". *Economics and Politics* 7: 59-78.

OECD (1995): "Budgeting for Results. Perspectives on Public Expenditure Management."

Persson, T. and L.E.O. Svensson (1989). "Why a Stubborn Conservative Would Run a Deficit: Policy with Time-Inconsistent Preferences". *Quarterly Journal of Economics* 104: 325-345.

Persson, T. and G. Tabellini (1992): "The Politics of 1992: Fiscal Policy and European Integration." *Review of Economic Studies* 59: 689-701.

Persson, T. and G. Tabellini (1994): "Representative Democracy and Capital Taxation." *Journal of Public Economics* 55: 53-70.