IRREVERSIBLE INVESTMENTS, DYNAMIC INCONSISTENCY AND POLICY CONVERGENCE

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Abstract

We study a model where two parties, one from the left and one from the right, compete for position. The election is to be held in the near future and the outcome is uncertain. Prior to the election, the members of both parties nominate their prime ministerial candidates. Investors care about the outcome since they may invest in irreversible domestic production capital. We find that there is political convergence in the nomination process. In some circumstances, it is only the median voter of the left-wing party that elects a more moderate candidate. In other instances, the members of both parties nominate more "conservative" candidates, but there is still convergence. We also show that a higher probability of the left winning the election increases the degree of convergence, while a more globalised economy (greater capital mobility) reduces it.

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Keywords: capital mobility, dynamic inconsistency, political competition, policy convergence.

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1 Introductory Remarks

A perennial issue in political economy is the effects of electoral competition on politicians' policy choices. The most well-known result is based on the median-voter theorem: Under certain technical conditions political parties competing for office converge to the position held by the median voter. As long as they can make binding electoral promises and voter preferences are fully known, this results holds for both purely office-motivated and ideologically based political parties; under such circumstances this is the only campaign platform that cannot be bettered by an opponent. The polar opposite case of no convergence results when policy-motivated parties compete for office but cannot credibly commit to specific post-election policies. Voters will then realise that parties will pursue their most preferred policies if they win, rendering incredible attempts at appearing to be moderate and fixing their electoral fortunes. Finally, there are also theories predicting partial convergence in policies.[1] If parties have ideologies they want to implement and can credibly commit to a policy ex ante, they must weigh the gain at the polls that a more moderate stance will bring against the costs of having to implement a less-than-ideal policy if they get into office. We investigate another mechanism that can induce policy convergence. We argue that the negative effects that policy uncertainty has on domestic irreversible investments can generate partial convergence. The degree of convergence depends, among other things, on the transactions costs associated with foreign investments.

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

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

it. Hence, globalization - perhaps contrary to popular belief - might actually generate policy divergence between left and right in the political landscape.

In the second case both parties, both L and R, want to 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.

Our paper builds on two different branches of economic analysis. It is related to the literature that investigates, both theoretically and empirically, the potential negative effects of political risk on investment. Alesina and Tabellini (1989) is probably the theoretical contribution that is closest to ours, though there the investment decision is made only once and irreversibility is thus not an issue. In addition, politics is not endogenous in their model. More generally, policy uncertainty tends on the one hand to reduce investment by creating an option value of postponing an irreversible decision until the uncertainty is resolved, and on the other to catch investors with too high levels of capital when less favourable outcomes are realised. Thus, the net effects of the combination of irreversibility and uncertainty on investment and the amount of capital held is not clear a priori.[2] Hagen (2002) demonstrates that the effects of political uncertainty on investment in the public sector might also go either way. This might explain the contrarian findings of Alesina and Perotti (1996), who find that political instability has a negative effect on total investment, and Campos and Nugent (2003), who find that the negative impact is short-lived, with the long-run impact being positive. Aizenman and Marion (1999) find no effect, as the sometimes positive impact on public investment counteracts the negative effect on private investment. We confine ourselves to a situation where there is no public investment, and where policy uncertainty has a negative impact on private investment.

Our paper also belongs to the literature on strategic delegation. In interaction with rational decision makers it can be beneficial to pre-commit to a strategy. One way to commit is by choosing a delegate with preferences different from one's own. Schelling (1960) was perhaps the first to lay out the logic of this argument. Vickers (1985) applied the idea in an industrial economics setting, and Rogoff (1985) argued that electing a conservative central banker could be a strategy to alleviate the dynamic inconsistency problem in monetary policy. Persson and Tabellini (1994) use the same logic to study delegation in a dynamic taxation problem. They show that the well-known dynamic inconsistency problem in optimal capital taxation can be reduced in a representative democracy, since this framework allows the median voter to elect a policy maker

[2] The basic literature on optimal investment under conditions of uncertainty and irreversibility is thoroughly explored in Dixit and Pindyck (1994). They briefly discuss the point made more forcefully by Abel and Eberly (1999), namely that the implications of these models for aggregate investment or capital stocks are not clear. The latter find that in the long-run, either effect might dominate.

that cares more about the welfare of the capitalists. Our paper extends their analysis as it includes political competition and policy uncertainty in a model where domestic capital investments are irreversible.

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

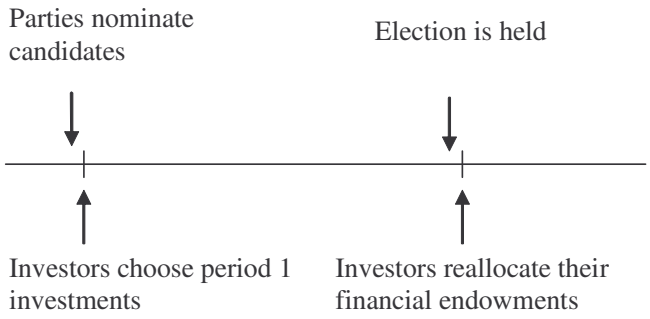
2.1 Preferences and timing

Consider a 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. 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. 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. The sequence of events is illustrated in figure 1.



Timing of Moves

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.[3] 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,[4] 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 when future policy is uncertain and productive investments are irreversible.

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 we assume all citizens are alike in terms of their economic characteristics, we may study the decision making of a representative investor. He enters period 1 with a given endowment, E_1, which he allocates optimally

[3] 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).

[4] 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.

between k_1 and f_1 given the tax rate in period 1, τ_1, and his expectations of the rate of taxation of k_2.[5] 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 $k_2 \geq k_1$ (for simplicity, depreciation is ignored). The net returns to investing abroad are $\nu = r - \mu$, where r are the gross returns per unit of capital and μ is the cost of making investments abroad.[6] Profits over the two periods are equal to $\Pi = \{H(k_1) - \tau_1 k_1 + (1+\nu)(E_1 - k_1)\} + \{H(k_2) - \tau_2 k_2 + (1+\nu)(E_2 - k_2)\}$, where the resources available for reinvestment in period 2 is equal to profits earned in the first period; $E_2(k_1) = H(k_1) - \tau_1 k_1 + (1+\nu)(E_1 - k_1)$. For simplicity there is no discounting of second period income, and we assume that the rate of return and mobility costs are constant over the two periods we study, hence there is no time index on the rate of return or mobility costs of foreign investments.

Optimal investment in the second period.

To solve the model we start with optimal choices in the second period. Let k_1^* be the optimal amount of capital invested in domestic production in the first period. In the second period the investors choose investment after the identity of the new government and thus after the tax rate is known. Given the resources available for reinvesting investors maximise their returns subject to the tax rate chosen in the second period and the irreversibility constraint:

$$Max\ H(k_2) - \tau_2 k_2 + (1+\nu)\left[E_2(k_1^*) - k_2\right]\ \ s.t.\ k_2 \geq k_1^*. \tag{2}$$

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[7]

$$H'(k_2^*) - \tau_2 = 1 + \nu. \tag{3}$$

The critical second period tax rate that sets apart the corner solution and the interior solution is the first period tax rate. For $\tau_2 \geq \tau_1$ the irreversibility constraint binds and $k_2^* = k_1^*$, whereas for $\tau_2 < \tau_1$ the solution is interior and optimal second period 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 in period 2 is

[5] 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.

[6] Hence, μ 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.

[7] 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 $\frac{\partial Z(x,y)}{\partial x}$.

$$k_2^* = \frac{1}{1+\nu+\tau_2}. \tag{4}$$

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

$$\tau_2 k_2^* = \begin{cases} \frac{\tau_2}{1+\nu+\tau_2}, \tau_2 < \tau_1; \\ \tau_2 k_1^*, \tau_2 \geq \tau_1. \end{cases} . \tag{5}$$

If the second period tax rate is set higher than the first period tax the irreversibility constraint binds. The tax base is then independent of the tax rate and the tax income is a linear function of the tax rate.

Optimal policy in the second period

The second period tax rate is chosen by the government that is elected into office. A period 2 government of type j maximises

$$c_2(\tau_2) + \gamma^j u(g_2) \tag{6}$$

subject to the budget constraints $c_2(\tau_2) = H(k_2^*(j)) - \tau_2^j k_2^*(j) + (1+\nu)[E_2(k_1^*) - k_2^*(j)]$ 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 $\tau_2^j < \tau_1$, the following first-order conditions must be satisfied:

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

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

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

To get a closed form solution we also assume that the utility function for public consumption is logarithmic: $u(g_2) = \ln g_2$. Then the solution is

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

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

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

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 $\tau_2^j \geq \tau_1$ - we are at the linear portion of the Laffer-curve and the optimal values of the choice variables are[8]

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

$$\eta = 1; \tag{9a}$$
$$g_2^{j*} = \gamma^j; \tag{9b}$$
$$\tau_2^{j*} = \frac{\gamma^j}{k_1^*}. \tag{9c}$$

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 consumption. Also note that τ_2^{j*} is inversely related to k_1^* in this optimum. Our next step is to derive the optimal first period investment in domestic production.

2.3 Optimal investment in period 1

Investors are rational and since domestic investments are irreversible they must take post-election policies into account when deriving optimal first period investments. Looking ahead they realize that second period tax policy is uncertain. The tax rate on capital depends on the outcome of the election. To focus on the mechanism that we are interested we assume that there is a fixed probability p that a government of type L is in power in period 2, i.e., we rule out the possibility that political parties moderate their policies to increase the likelihood of being elected by assumption. The decision problem of investors then is to maximise the expected returns to period 1 investment given by

$$\begin{aligned} &p\left\{H(k_2^*(L)) - \tau_2^{L*}k_2^*(L) + (1+\nu)\left[E_2(k_1) - k_2^*(L)\right]\right\} + \\ &(1-p)\left\{H(k_2^*(R)) - \tau_2^{R*}k_2^*(R) + (1+\nu)\left[E_2(k_1) - k_2^*(R)\right]\right\}, \end{aligned} \tag{10}$$

subject to the resource constraint $E_1 = k_1 + f_1$, the irreversibility constraint $k_2^*(j) \geq k_1^*$ for $j = L, R$, and taking period 2 tax rates (and thus aggregate investment at home in period 2) as given.[9] To solve this problem, we must consider the various possible configurations of tax rates in period 2.

Using the fact that the left-wing government always chooses strictly higher tax rates than a right wing government we are left with three possible cases. First, we might have a configuration where $\tau_2^{L*} > \tau_1 \geq \tau_2^{R*}$. 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. 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 will then have a configuration where $\tau_2^{L*} > \tau_2^{R*} > \tau_1$, i.e., both parties choose a tax rate on the linear portion of the Laffer curve in the second period. A third possibility

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

is that both types of governments want to implement tax rates that are lower than τ_1. Consequentially, the irreversibility constraint does not bind for any of the two types and optimal first period investment solves $H'(k_1^*) = 1 + \nu + \tau_1$.[10] We ignore this case, simply because this is a standard one period investment problem where there is no link between second period policy and first period investment.

Let us first consider the instance where the election of the left-wing party implies a higher tax rate on capital, while the election of the right-wing party implies a lower capital tax rate, that is, the instance where the irreversibility constraint binds only if there a L-government is in power in the second period. Hence, we have $\tau_2^{L*} > \tau_1 \geq \tau_2^{R*}$ and $k_2^*(L) = k_1^*$. Adjusting the maximisation problem of the representative investor to take this into account, we find that the first-order condition is[11]

$$p\left[H'(k_1^*) - \tau_2^{L*} + (1+\nu)\left(E_2'(k_1^*) - 1\right)\right] + (1-p)(1+\nu)\left[E_2'(k_1^*)\right] = 0. \quad (11)$$

The corresponding optimal level of first period investment is

$$k_1^* = \frac{p + 1 + \nu}{p\left(\tau_2^{L*} + 1 + v\right) + (1+\nu)(\tau_1 + 1 + \nu)}. \quad (12)$$

First note that the tax rate chosen by a period 2 government of type R does not enter the expression. This is because in this regime the tax rate will be set so that the irreversibility constraint does not bind. The marginal rate of return to period 2 investment is then independent of the allocation of resources to investment at home and abroad in period 1, and is equal to $1 + \nu$. Observe also 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. Indeed, we see that if $p = 0$, k_1^* is equal to the level of capital that is chosen when the tax rates of both types of potential future governments are below τ_1. This is the way Bernanke's (1983) "bad news principle" operates in our model.

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 or ν increases. It is also easy to show that $\frac{\partial k_1^*}{\partial p} < 0$ when $\tau_2^{L*} \geq \tau_1$. 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 $\tau_2^{L*} > \tau_2^{R*} > \tau_1$. 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

[10] To have an interesting problem, we assume that the solution to this equation exceeds the level of capital inherited from the past, i.e., that the irreversibility constraint is not binding in period 1.

[11] To derive this first order condition we use equation (10) and the fact that $k_2^* = k_1^*$. It is readily demonstrated that the second-order condition is satisfied both in this case and in the next one.

$$p\left[H'(k_1^*) - \tau_2^{L*} + (1+\nu)\left(E_2'(k_1^*) - k_1^*\right)\right] + \tag{13}$$
$$(1-p)\left[H'(k_1^*) - \tau_2^{R*} + (1+\nu)\left(E_2'(k_1^*) - k_1^*\right)\right] = 0.$$

Solving for k_1^* yields

$$k_1^* = \frac{1 + (1+\nu)}{\tau_2^e + (1+\nu)\left[\tau_1 + (1+\nu) + 1\right]}, \tag{14}$$

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 and ν are all negative.[12] 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 preceding section, optimal first period investment was derived given investors' expectations of period 2 tax rates. Investments are made after the two parties have chosen their prime ministerial candidates. Hence, investors know what the optimal period 2 tax rates of possible future governments are. Still, in cases where $\tau_2^j \geq \tau_1$ 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. So we must check for consistency. Given the explicit solutions we have derived, this is fairly easy. Take case 1, $\tau_2^{L*} > \tau_1 \geq \tau_2^{R*}$, 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 (12) in (9c) yields

$$\widehat{\tau}_2^L = \frac{\gamma^L\,(1+\nu)\,(\tau_1 + p + \nu + 1)}{(1-\gamma^L)\,p + (1+\nu)}. \tag{15}$$

A hat is used to denote the equilibrium level of a variable. In turn, using this expression in (12) allows us to derive an explicit solution for the equilibrium investment level in period 1.

$$\widehat{k}_1 = \frac{\left(1-\gamma^L\right)p + (1+\nu)}{(1+\nu)\,(\tau_1 + \nu + p + 1)}. \tag{16}$$

Note that these are solutions in what we shall call the policy equilibrium. Since we have not considered the political choice of candidates for the two parties, this is not the full equilibrium of the model. We are ultimately interested in what kind of prime ministerial candidates the parties nominate, and given

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

this aim both (15) and (16) contain an endogenous variable, γ^L. Likewise, $\widehat{\tau}_2^R$, which is simply equal to $\gamma^R(1+\nu)$ in this case, is a function of γ^R, which is a choice variable of party R. Equilibrium values of γ^L and γ^R are derived in the next section.

We can easily see that $\widehat{\tau}_2^R$ is increasing in γ^R as well as in ν. 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, ν and p. 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 $\tau_2^{L*} > \tau_2^{R*} > \tau_1$, $\tau_2^{j*} = \frac{\gamma^j}{k_1^*}$, $j = L, R$. Substituting (14) 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 $\widehat{\tau}_2^j$:

$$\widehat{\tau}_2^j = \frac{\gamma^j(1+\nu)[\tau_1 + (1+\nu) + 1]}{1 + (1+\nu) - [p\gamma^L + (1-p)\gamma^R]}; j = L, R. \tag{17}$$

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 have a higher equilibrium tax rate in period 2. The optimal first period investment is now given by

$$\widehat{k}_1 = \frac{1 + (1+\nu) - \left[p\gamma^L + (1-p)\gamma^R\right]}{(1+\nu)[\tau_1 + (1+\nu) + 1]}. \tag{18}$$

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 also increases $\widehat{\tau}_2^R$, and vice versa. The reason is that if a party nominate a more left-leaning candidate the expected second period tax rate increases and this lowers the optimal level of investment in period 1. The tax base shrinks, which in turn leads to an increase in the optimal period 2 tax rate for the other party. 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

4.1 The case of $\tau_2^{L*} > \tau_1 \geq \tau_2^{R*}$

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 recognize how their political choice affect the economy, and thus 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 only the left wing government wants to increase the tax rate in the second period; $\widehat{\tau}_2^L > \tau_1 \geq \widehat{\tau}_2^R$. 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 $V^{m_b}(R) \equiv U^{m_b}\left(c\left(\widehat{\tau}_2^R\left(\gamma^R\right), \widehat{k}_1\left(\gamma^L\right), \widehat{k}_2\left(\gamma^R\right)\right), \widehat{g}^R\left(\gamma^R\right)\right)$.[13] Expected utility is of course $\Omega^{m_b}(j) = pV^{m_b}(L) + (1-p)V^{m_b}(R)$.

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 $c = H(k_2) - \tau_2 k_2 + (1+v)(E_2(k_1) - k_2)$ for $k_2 \geq k_1$ and $g = \tau_2 k_2$, are[14]

$$\frac{\partial V^{m_L}(L)}{\partial \gamma^L} = \left[H' - \widehat{\tau}_2^L + (1+\nu)\left(E_2' - 1\right)\right]\frac{\partial \widehat{k}_1}{\partial \gamma^L} - \frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 + \gamma^{m_L} u'\left(\frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 + \widehat{\tau}_2^L\frac{\partial \widehat{k}_1}{\partial \gamma^L}\right) \tag{19a}$$

$$\frac{\partial V^{m_L}(R)}{\partial \gamma^L} = (1+\nu)E_2'\frac{\partial \widehat{k}_1}{\partial \gamma^L}. \tag{19b}$$

Using the fact that $u'\left(\widehat{g}^L\right) = \frac{1}{\gamma^L}$, we find that the expected marginal utility of m_L with respect to the weight attached by the prime ministerial candidate of his party on the utility of public consumption may be written as

[13] Because the optimal levels of provision of public goods in period 2 do not depend on period 1 investment, $\widehat{g}^R\left(\gamma^R\right)$ and $\widehat{g}^L\left(\gamma^L\right)$ 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.

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

$$\frac{\partial \Omega^{m_L}(j)}{\partial \gamma^L} = \left[p\left(H' - \widehat{\tau}_2^L - 1 - \nu\right) + (1+\nu)E_2'\right]\frac{\partial \widehat{k}_1}{\partial \gamma^L} + p\left[\frac{\gamma^{m_L}}{\gamma^{L*}}\left(\frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 + \widehat{\tau}_2^L\frac{\partial \widehat{k}_1}{\partial \gamma^L}\right) - \frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1\right] \tag{20}$$

The expression in square brackets preceding $\frac{\partial \widehat{k}_1}{\partial \gamma^L}$ is zero at the optimum for first period investment (c.f. (11)). Therefore, at the optimum, where $\frac{\partial \Omega^{m_L}(j)}{\partial \gamma^L} = 0$, we have

$$\left(\frac{\gamma^{m_L}}{\gamma^{L*}} - 1\right)\frac{\partial \widehat{\tau}_2^L}{\partial \gamma^L}\widehat{k}_1 + \frac{\gamma^{m_L}}{\gamma^{L*}}\widehat{\tau}_2^L\frac{\partial \widehat{k}_1}{\partial \gamma^L} = 0. \tag{21}$$

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 $\gamma^{L*} < \gamma^{m_L}$. By using the expressions in (15) and (16) in the first order condition ((20)) we can derive an explicit expression for the optimal choice of prime minister candidate:

$$\gamma^{L*}(\gamma^{m_L}) = \left[\frac{p + (1+\nu)}{(1+\gamma^{m_L})p + (1+\nu)}\right]\gamma^{m_L}. \tag{22}$$

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

$$\frac{\partial \gamma^{L*}(\gamma^{m_L})}{\partial \gamma^{m_L}} = \left[\frac{p + (1+\nu)}{(1+\gamma^{m_L})p + (1+\nu)}\right]^2 > 0; \tag{23a}$$

$$\frac{\partial \gamma^{L*}(\gamma^{m_L})}{\partial p} = -\left[\frac{\gamma^{m_L}}{(1+\gamma^{m_L})p + (1+\nu)}\right]^2 (1+\nu) < 0; \tag{23b}$$

$$\frac{\partial \gamma^{L*}(\gamma^{m_L})}{\partial \nu} = p\left[\frac{\gamma^{m_L}}{(1+\gamma^{m_L})p + (1+\nu)}\right]^2 > 0. \tag{23c}$$

The first result 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]

(23b) and (23c) show that the optimal choice of γ^L is decreasing in p and increasing in ν. The intuition is best grasped by rewriting (20) 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 (15), and is increasing in p and decreasing in ν. That is, at higher levels of p (ν), $\widehat{\tau}_2^L$ 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 is higher, and so less is at stake for private investors. They 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!

The choice of a prime ministerial candidate is easier for members of party R. The counterparts of (19a) and (19b) are[17]

$$\frac{\partial V^{m_R}(L)}{\partial \gamma^R} = 0; \tag{24a}$$

$$\frac{\partial V^{m_R}(R)}{\partial \gamma^R} = \left[H' - \widehat{\tau}_2^R - (1+\nu)\right] \frac{\partial \widehat{k}_2(R)}{\partial \gamma^R} - \frac{\partial \widehat{\tau}_2^R}{\partial \gamma^R} \widehat{k}_2(R) + \gamma^{m_R} u' \left(\frac{\partial \widehat{\tau}_2^R}{\partial \gamma^R} \widehat{k}_2(R) + \widehat{\tau}_2^R \frac{\partial \widehat{k}_2(R)}{\partial \gamma^R} \right). \tag{24b}$$

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 a candidate whose preferences are different from her own. The period 2 tax policy of her party does not affect

[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 $\epsilon_{\gamma^L}^{\widehat{k}_1}$.

[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.

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.

Let us summarize our main findings for the case of $\tau_2^{L*} > \tau_1 \geq \tau_2^{R*}$ in a proposition.

Proposition 1 *a) There is partial convergence of ideological positions in equilibrium:* $0 < \gamma^{L*} - \gamma^{R*} < \gamma^{\lambda} - \gamma^{\rho}$. *b) Convergence is higher the more likely it is that the left wing party wins the election:* $\gamma^{L*} - \gamma^{R*}$ *decreases in* p. *c) Convergence is lower the more mobile capital is:* $\gamma^{L*} - \gamma^{R*}$ *increases in* ν.

The first result tells us that relative to a situation in which domestic investments in physical capital are fully reversible, in which case there would be no reason for the median member of either party to nominate someone with different preferences, there is partial convergence of ideological positions in equilibrium.[18] It is well known from the literature on party or candidate competition that there will be partial convergence, as opposed to complete convergence, if politicians are policy-motivated and there is uncertainty about the preferences of voters.[19] This is in line with our result, but in the standard models convergence is due to the fact that parties try to increase their probability of winning the election. We hold this probability constant, but the economics of the model still generate partial convergence. The mechanism that generates convergence is thus different from the one discussed in earlier studies. It is also worth noting that in this case our model predicts that it is only the left wing party that will moderate its policy, while in the models where the probability of being elected is endogenous the median voter of both parties would find it worthwhile to nominate a candidate closer to the centre.

Another point worth mentioning is that we separate between preferences and policies, a distinction 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. We derive optimal policies from the primitives, including preferences for public goods, which is the source of political

[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 $\frac{\gamma^{\lambda}-\gamma^{\rho}}{\gamma^{\lambda}} > \left[\frac{p}{p+(1+\nu)}\right]\gamma^{\rho}$.

[19] 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 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.

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.[20]

Our second observation is that the more likely it is that the L-party wins the election the more moderate is the candidate that the median voter of that party nominates. An increase in the probability that the L-party wins aggravates the dynamic inconsistency problem in capital taxation, and to offset this effect the median voter in the left wing party nominates a candidate that is located further to the right of himself.

The third result in Proposition 1 tells us that lower mobility costs (higher ν) reduces the extent of policy convergence. The reason is that lower mobility costs imply more investments abroad and a smaller tax base. The optimal response for the median voter of the left wing party is to nominate a less conservative policy maker in order to increase public consumption. This means that, perhaps contrary to popular belief, globalisation might actually generate divergence, not convergence, between the political left and right. Interestingly, though, divergence in political ideologies does not necessarily lead to divergence in politics: The derivative of $\widehat{\tau}_2^L - \widehat{\tau}_2^R$ with respect to ν is not necessarily increasing. The reason for this ambiguity is that $\widehat{\tau}_2^R$ is also increasing in ν. Hence, while lower costs of moving capital across borders result in ideological divergence, the effect on differences in policy need not go in the same direction.

A numerical example is helpful in illustrating the proposition. Below is a table where $p = 0.3(0.6), \nu = 0.03$ and $\tau_1 = 0.25$.

γ^{ρ}	γ^{L*}	$\widehat{\tau}_2^L$	$\widehat{k}_1$
0.25	0.236(0.228)	0.327(0.328)	0.769(0.764)
0.30	0.280(0.270)	0.393(0.400)	0.761(0.749)
0.35	0.324(0, 310)	0.464(0.477)	0.752(0.733)
0.4	0.366(0.348)	0.530(0.557)	0.743(0.717)

Suppose $\gamma^{\rho} = 0.2$, which means that the median member of the $R-$party is the prime minister candidate from this party ($\gamma^{R*} = \gamma^{\rho} = 0.2$). If the right wing party wins the election there will be a 21% capital tax rate in the second period ($\tau^{R*} = \gamma^{R*}(1+\nu)$). The table illustrates the degree of convergence in ideologies between the two parties. We can also see that the degree of convergence in ideologies is higher when it is more likely that the $L-$party wins the election, while there is divergence in politics (tax rates) when p increases.

[20] $\widehat{\tau}_2^L - \widehat{\tau}_2^R$ under delegation is in this case found by inserting (20) in (14) and subtracting $\widehat{\tau}_2^R = \gamma^{\rho}(1+\nu)$. 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 $\gamma^{\rho}(1+\nu)$. One then finds that the former difference is less than the latter.

4.2 The case of $\tau_2^{L*} > \tau_2^{R*} > \tau_1$

Turning to case 2, where the second period equilibrium tax rates of both parties exceed 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 identities of both prime ministerial candidates (c.f. (18)). In turn, as shown in (17) 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 vice versa.

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

$$\begin{aligned}
\frac{\partial \Omega^{m_L}(j)}{\partial \gamma^L} &= p\left[\frac{\gamma^{m_L}}{\gamma^{L*}}\left(\epsilon_{\gamma^L}^{\widehat{\tau}_2^L}+\epsilon_{\gamma^L}^{\widehat{k}_1}\right)-\epsilon_{\gamma^L}^{\widehat{\tau}_2^L}\right] \qquad (25a)\\
&\quad +(1-p)\frac{\gamma^{R*}}{\gamma^{L*}}\left[\frac{\gamma^{m_L}}{\gamma^{R*}}\left(\epsilon_{\gamma^L}^{\widehat{\tau}_2^R}+\epsilon_{\gamma^L}^{\widehat{k}_1}\right)-\epsilon_{\gamma^L}^{\widehat{\tau}_2^R}\right];\\
\frac{\partial \Omega^{m_R}(j)}{\partial \gamma^R} &= p\frac{\gamma^{L*}}{\gamma^{R*}}\left[\frac{\gamma^{m_R}}{\gamma^{L*}}\left(\epsilon_{\gamma^R}^{\widehat{\tau}_2^L}+\epsilon_{\gamma^R}^{\widehat{k}_1}\right)-\epsilon_{\gamma^R}^{\widehat{\tau}_2^L}\right] \qquad (25b)\\
&\quad +(1-p)\left[\frac{\gamma^{m_R}}{\gamma^{R*}}\left(\epsilon_{\gamma^R}^{\widehat{\tau}_2^R}+\epsilon_{\gamma^R}^{\widehat{k}_1}\right)-\epsilon_{\gamma^R}^{\widehat{\tau}_2^R}\right].
\end{aligned}$$

These expressions are considerably simplified by the fact that $\epsilon_{\gamma^L}^{\widehat{\tau}_2^L}+\epsilon_{\gamma^L}^{\widehat{k}_1}=1=\epsilon_{\gamma^R}^{\widehat{\tau}_2^R}+\epsilon_{\gamma^R}^{\widehat{k}_1}$ and $\epsilon_{\gamma^L}^{\widehat{\tau}_2^R}+\epsilon_{\gamma^L}^{\widehat{k}_1}=0=\epsilon_{\gamma^R}^{\widehat{\tau}_2^L}+\epsilon_{\gamma^R}^{\widehat{k}_1}$, results which are readily confirmed starting from (17) and (18). Using these in (23a) and (23b) and equating the result with zero, one finds that in the Nash-equilibrium

$$\begin{aligned}
\gamma^{L*}\left(\gamma^{m_L},\gamma^{R*}\right) &= \left[\frac{1+(1+\nu)-(1-p)\gamma^{R*}}{1+(1+\nu)+p\gamma^{m_L}}\right]\gamma^{m_L}; \qquad (26a)\\
\gamma^{R*}\left(\gamma^{L*},\gamma^{m_R}\right) &= \left[\frac{1+(1+\nu)-p\gamma^{L*}}{1+(1+\nu)+(1-p)\gamma^{m_R}}\right]\gamma^{m_R}. \qquad (26b)
\end{aligned}$$

Equations (24a) and (24b) expose the interdependency in the choice of candidates. If party j nominates a more conservative candidate, the best response of a member of party i is to nominate a less conservative candidate. The nomination of candidates are strategic substitutes: if one party elects a candidate with a stronger taste for public consumption equilibrium first-period investment at home declines, causing a shift in the opposite direction in the other party to mitigate the negative impact. Again we see from equations (24a) and (24b) that the choice of candidates in each party is determined by the median voter in

that party (the policy stance of the optimal delegate is increasing in the weight a party member attaches to period 2 public consumption). 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

$$\gamma^{L*}\left(\gamma^{\lambda}, \gamma^{\rho}\right) = \left[\frac{1+(1+\nu)}{1+(1+\nu)+\left[p\gamma^{\lambda}+(1-p)\gamma^{\rho}\right]}\right]\gamma^{\lambda}; \tag{27a}$$

$$\gamma^{R*}\left(\gamma^{\lambda}, \gamma^{\rho}\right) = \left[\frac{1+(1+\nu)}{1+(1+\nu)+\left[p\gamma^{\lambda}+(1-p)\gamma^{\rho}\right]}\right]\gamma^{\rho}. \tag{27b}$$

Based on these two equations we can make the following Proposition for the case when $\tau_2^{L*} > \tau_2^{R*} > \tau_1$.

Proposition 2 *a) The median voters of both parties nominate more "right wing" candidates than themselves. b) Higher capital mobility induces the median voters of both parties to nominate more left-wing candidates. c) There is partial convergence in ideologies and policies between the parties.*

From equation (25a) and (25b) we have $\gamma^{L*}\left(\gamma^{\lambda}, \gamma^{\rho}\right) = \psi\gamma^{\lambda}$ and $\gamma^{R*}\left(\gamma^{\lambda}, \gamma^{\rho}\right) = \psi\gamma^{\rho}$, where $\psi = \left[\frac{1+(1+\nu)}{1+(1+\nu)+\left[p\gamma^{\lambda}+(1-p)\gamma^{\rho}\right]}\right]$, and since $\psi < 1$ it follows that the median members of both parties prefer delegates with a weaker taste for public consumption than they themselves have. The reason is that in this case both parties face a dynamic inconsistency problem in capital taxation, and to alleviate this problem they nominate candidates with a preference for lower taxation.

To check statement b in Proposition 2 one only needs to take the derivative of γ^{L*} and γ^{R*} with respect to ν. We then find that a higher ν means that a more left-wing candidate is optimal. Hence, here as well lower transaction costs and more mobile capital lead to a higher expected level of taxation. The reason is the same as in the previous case: 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 seems to be 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.

On the issue of convergence, note that as $0 < \psi < 1$, $\gamma^{L*} - \gamma^{R*} = \psi\left(\gamma^{\lambda} - \gamma^{\rho}\right) < \gamma^{\lambda} - \gamma^{\rho}$ which means that in equilibrium there is partial convergence in terms of candidate ideology in this case as well.[21] Another interesting question is how greater capital mobility affects this tendency: Does globalisation in this sense lead to stronger convergence in political platforms? Does it lead to stronger policy convergence? 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 $\frac{\partial\left(\gamma^{L*}-\gamma^{R*}\right)}{\partial\nu}$ can be seen to be the same as the sign of $\frac{\partial\psi}{\partial\nu}$, which we know is

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

positive. Furthermore, inserting (25a) and (25b) in the corresponding versions of (17), 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, as well as τ_1. It turns out to be a positive function of the marginal returns to investing abroad . 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

The first part of our paper investigates how party competition - and the policy uncertainty that follows - affects irreversible domestic investments. We then take our analysis one step further and ask how the economic consequences of policy uncertainty interact with the nomination of political leaders in the different parties. We found that if it is only the left wing party that wants to increase taxation, 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 into account how second-period taxation distorts first-period investment. The median members of that party will optimally chose a more "conservative" prime ministerial candidate than the median party members. 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 work is related to Persson and Tabellini (1994), who investigate how the dynamic inconsistency problem associated with capital taxation impinge on the choice of politicians. Our study differs form theirs because we investigate how dynamic inconsistency affects the nomination of candidates in a model of party competition, while they used a model of representative democracy featuring no parties. Another difference is that 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.[22]

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. Therefore, 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

[22] These assumptions also set our model apart from Persson and Tabellini (1992), who analyse capital mobility and the politics of fiscal policy in a median voter model.

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 candidates 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 candidates 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.

Although we have 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 further distort 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 References

Abel, A. and J.C. Eberly (1999): "The Effects of Irreversibility and Uncertainty on Capital Accumulation". *Journal of Monetary Economics* 44: 339-377.

Aizenman, J. and N. Marion (1999): "Volatility and Investment: Interpreting Evidence from Developing Countries." *Economica* 66: 157-179.

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

Alesina, A. og R. Perotti (1996): "Income Distribution, Political Instability, and Investment." *European Economic Review* 40: 1203-1228.

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

Alesina, A. and G. Tabellini (1989): "External Debt, Capital Flight and Political Risk." *Journal of International Economics* 27: 199-220.

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

Bernanke, B. (1983): "Irreversibility, Uncertainty, and Cyclical Investment." *Quarterly Journal of Economics* 98: 85-106.

Campos, N.F. and J.B. Nugent (2003): "Aggregate Investment and Political Instability: An Econometric Investigation." *Economica* 70: 533-549.

Dixit, A.K. and R.S. Pindyck (1994): *Investment Under Uncertainty.* Princeton University Press.

Hagen, R.J. (2002): "The Electoral Politics of Public Sector Institutional Reform." *European Journal of Political Economy* 18: 449-473.

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.

Rogoff, K. (1985): "The Optimal Degree of Commitment to an Intermediate Monetary Target," *Quarterly Journal of Economics* 100: 1169-89.

Shelling, T. (1960): *The Strategy of Conflict.* Cambridge, MA. Harvard University Press.

Vickers, J. (1985): "Delegation and the theory of the firm." *The Economic Journal*, 95, 138-147.

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