Abstract

We study, in a model with unemployment, how labour market status affects the preferences for public spending, whether in the form of a public good or subsidies. We then derive the implications for the dynamics of government expenditures, under the hypothesis of majority voting. These will exhibit positive persistence if the employed are marginally more powerful than the unemployed, and negative persistence if the unemployed are marginally more powerful. Under a uniform distribution of tastes for the public good, there is no persistence. The unemployed's preferences may be non single-peaked, so that high unemployment may destroy the existence of a voting equilibrium.

Voting for jobs: policy persistence and unemployment[1]

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1 Introduction

It is often heard that government spending in many European countries is too high and that the size of the government should be reduced. Yet, as is evidenced from the political outcry in late 1995 at the French government plan's to reduce government and welfare spending, this seems a painful process, which faces a lot of resistance by voters and organized interests. In this paper we argue that such resistance may have to do with the state of the labor market and the high level of unemployment in many European countries. Unemployment induces people to stick to their jobs and accordingly lobby or vote against measures that would tend to destroy their jobs. Thus, public employees will try to counter attempts to reduce the size of the public sector; and, the larger the public sector initially, the more powerful this lobby and the more difficult it is to reduce government spending. This is in sharp contrast with the no unemployment case where people would not care about their job being destroyed since they would quickly find one in another sector at the same equilibrium wage.

There are many real-world examples where the existence of unemployment affects the structure and level of public spending because of political considerations. Thus, while in the U.S. the 1994 congressional elections favored an agenda of sharp reductions in public spending, it has proved much more difficult to reduce it in France in 1995, in spite of a deficit of 6 % of GDP. Many programs and subsidies where not removed because they would jeopardize jobs in a situation of high unemployment. Over the longer run, it has taken decades to remove subsidies to declining industries such as the textile, steel, or naval industries, and many bodies such as the Planning, Industry, or Veterans administration have survived the original reasons for their existence and go on employing many people. Similarly, in countries such as Russia and Poland, the emergence of unemployment has brought back to power ex-communists who maintained subsidies and slowed the privatization process. By contrast, in the Czech republic where unemployment was much smaller, subsidies where quickly removed and transition was much quicker.[1]

The purpose of this paper is to study the determinants of government spending in a model where labor market rigidities generate a positive level of equilibrium unemployment. We argue that when voting on government spending, in addition to the utility of public goods, people take into account the effect of government expenditures on their probability of getting (or keeping) a job. In the absence of unemployment, there is no such effect, and government spending is determined by the "true", or "intrinsic" preferences of the median voter with respect to the public good. In particular, an individual will vote for the same spending level whether he works in the public or the private sector (in the public sector we include the share of the private sector heavily dependent on government contracting, such as the defence or medical industry). When there is unemployment, government expenditure affects the probability of being employed, so that public sector employees will have different preferences from private sector employees. An increase in government spending increases employment in the public sector at the expense of the private sector, so that public employees have higher probability of keeping their jobs and private employees a lower probability. Accordingly, public employees will be more in favor of a large public sector, all else equal, than private employees. We show that this phenomenon may generate sluggishness, or positive persistence, in public expenditure: more civil servants today mean a larger political support for a high spending level, hence more spending tomorrow.

However, this is only one possibility, and we get a much richer set of results. In particular, we show that the unemployed will vote in a *radical* way, i.e. that they will be in favor of high spending if it is initially low and

[1]This "fear of unemployment" is one of the main mechanisms put forward by Aghion and Blanchard (1994) to account for sluggishness in the transition process, in the context of a model where restructuring is the outcome of an individual firm's decision.

conversely. The reason is that they want large job reallocation to take place in order to increase their likelihood of getting a job. Thus, while voting by the employed leads to sluggishness and positive persistence, voting by the unemployed leads to instability and negative persistence. We show that under a uniform distribution with enough dispersion, the two effects exactly cancel each other so that government spending exhibits no persistence and is exactly equal to its value absent unemployment. Under more general assumptions, there are zones where positive persistence prevails and zones where there is negative persistence. We also analyze what happens when the unemployed are less well represented in the political process than the employed, and show that the less politically important are the unemployed, the more sluggish is fiscal policy.

In addition to the unemployment rate, another important parameter which affects the magnitude of the effects highlighted here is labour mobility, i.e. how frequently people move between employment and unemployment. When mobility is high the above effects are small because current labor market status does not have a large effect on the probability of being employed in the future. By contrast, when mobility is low, those employed in a given sector today have a high probability of working in the same sector tomorrow relative to ending somewhere else, so that their employment probability will be very sensitive to the employment level of their own sector. It is this "insider" effect which is at the root of the persistence mechanisms studied in this paper.

While we focus on government spending, the argument applies to any change in government policy which is associated with job reallocation, such as trade liberalization, removal of subsidies, etc.

While the welfare analysis of labour market imperfections is complex, but well analyzed, the literature on the political determination of government spending has typically ignored the influence of unemployment and labour market imperfections . Either government spending is modelled as a redistributive game in a perfect labour market as in the voting literature[2], or unemployment can be directly reduced by manipulating an aggregate instrument as in the credibility and political business cycle literature[3], where it is a game between the public and the government that matters, rather than a redistributive game. The main originality of the present paper is to show how labour market status is an important determinant of political preferences, and to analyze how voting aggregates the labour market component of individual preferences for public policy.[4]

2 The model

2.1 The labor market

Total population is normalized to 1. There are two goods, a private good and a public good. Both are produced under constant returns with unit productivity. Therefore, if g_t denotes government spending at t, public employment is also equal to g_t, and private employment (=output) is equal to $1 - u_t - g_t$, where u_t is the unemployment rate. In g_t we lump all sectors which are complementary to the public good and whose employment therefore increases with the demand for the public good. Alternatively, we can interpret g_t as a subsidized sector and the private good as a taxed sector. People then vote on the subsidy rate rather than the level of public spending (this version of the model is formally presented in the Appendix).

[2]Meltzer and Richard (1981), Alesina and Tabellini (1990), Persson and Svensson (1989), Velasco (1993), Grossman and Helpman (1994)

[3]See Hibbs (1982), Barro and Gordon (1983), Alesina (1987), Rogoff and Siebert (1988); Calmfors and Horn (1986) for an analysis of credibility problem with an especial emphasis on real wage rigidity and unemployment. The present analysis is somewhat related to the discussion in Gelb et al. (1991), who analyze the general equilibrium consequences of government responses to unemployment in a Harris-Todaro model; however, in their model they assume an exogenous government reaction function to unemployment.

[4]Indeed, in this paper taxes are lump-sum and are used to finance a public good, so that there is no redistributive effect of government spending, while aggregate unemployment is unaffected by government spending; the two usual effects studied by the previous literature are therefore shut off.

Firms are wage takers. Equilibrium in the private sector therefore requires that the real wage be equal to labour productivity:

$$w_t = 1$$

As for unemployment, we assume it is constant and equal to u every period. This, because we want to focus on the impact of unemployment on public policy, while ignoring the more traditional effects of public policy on unemployment (see the discussion below, and the Appendix). Given the constancy of wages, a constant unemployment rate will indeed arise if real, pre tax, wages are given by an imperfectly competitive wage formation schedule:

$$w_t = f(u_t) \tag{1}$$

Where f is a decreasing function. Many bargaining models or efficiency wage models yield this sort of relationship, see for example Shapiro and Stiglitz (1984), Layard, Nickell and Jackman (1991), and the references therein.[5]

Government spending is financed by a lump-sum tax on all individuals (we assume that lump-sum taxes do not interfere with wage formation). There is no government debt, no unemployment benefits, and the budget must be balanced every period, implying that the tax is itself equal to g_t.

Agents are risk neutral with respect to private consumption. The intertemporal utility of individual i is:

$$V_{it} = E_t \sum_{s=t}^{+\infty} (\theta_{is} g_s - b g_s^2/2 + c_s) \delta^{s-t}$$

, where δ is the discount factor, c_s is consumption of the price level, and θ_{is} is an individual specific shock describing his preferences for public vs.

[5]Even (1), although extremely simple, can be given microfoundations. That is, a monopoly union first sets wages and then employers have a one shot opportunity to replace insiders with cheaper outsiders, but they must incur costs to find them. See Saint-Paul (1996), or more generally Lindbeck and Snower (1988) for static insider-outsider models of wage formation.

private consumption. To preserve tracatability and be sure that a voting equilibrium exist, we will henceforth assume that agents are myopic, i.e. $\delta = 0$, or $V_{it} = E_t(\theta_{it} g_s - b g_t^2/2 + c_t)$.

There is no borrowing and lending, but, given risk neutrality, we allow for negative consumption. The consumption of an employed worker at date t is therefore $1 - g_t$, while the consumption of an unemployed is $-g_t$.

2.2 Mobility and unemployment

In a perfect labor market, all workers are sure to be employed at the market wage. If there is unemployment, the model is incomplete unless it is specified how workers are allocated across employment and unemployment (a so-called "rationing scheme"). In many models, this is done by resorting to one of two simplifying assumptions. The first possibility is to assume, as in Diamond (1982), Shapiro and Stiglitz (1984), or Pissarides (1989), that there exists a constant exogenous probability of losing one's job; the probability for an unemployed worker of finding a job is then determined residually by equating the net outflow from unemployment to the net change in employment. The second possibility is to assume that the probability of being employed is one minus the unemployment rate, regardless of whether the individual was previously employed or not.

Our results crucially depend on the idea that the employed's probability of remaining employed is higher than the unemployed's probability to find a job, and that an employed's probability of remaining employed is responsive to the change in employment in the firm, or sector, where he is working. Therefore, we need to make a richer assumption about the way jobs are allocated.

Mobility between employment and unemployment is therefore described by a mobility function $\phi(u, g_{t+1}, g_t)$. By definition, $\phi(u, g_{t+1}, g_t)$ is the probability that a worker employed in the public sector at date t is employed (in any sector) at date t+1. We assume that ϕ has the following natural properties:

ASSUMPTION (A1)

$$\begin{aligned}
\phi(0,.,.) &= 1 \\
\phi(1,.,.) &= 0 \\
\partial\phi/\partial u &\leq 0 \\
\partial\phi/\partial g_{t+1} &\geq 0 \\
\partial^2\phi/\partial g_{t+1}^2 &\leq 0 \\
\phi(u,.,.) &\geq 1-u
\end{aligned}$$

The latter assumption rules out the possibility that the unemployed have better prospects of finding a job than the employed. The fourth assumption guarantees that when employment in a sector increases, those initially employed in that sector have a higher probability of remaining employed. Existing employees therefore have some priority over employment in their own sector. We shall call that the 'insider effect'.

The assumption that $\partial^2\phi/\partial g_{t+1}^2 \leq 0$ implies a decreasing marginal effect of tomorrow's public employment on the public employees probability of keeping their jobs. It is plausible, and ensures the existence of a median voter equilibrium provided the unemployed are not too numerous.

The probability for an employed worker in the private sector to be employed next period is described by the same function, with private sector employment as its arguments. It is therefore equal to $\phi(u, 1-u-g_{t+1}, 1-u-g_t)$.

It is then possible to compute the unemployed's probability of finding a job at $t+1$. Let ψ_{t+1} be this probability. Then the aggregate employment probability must be equal to the employment rate, implying:

$$\begin{aligned} & \psi_{t+1}u + \phi(u, g_{t+1}, g_t)g_t + \phi(u, 1-u-g_{t+1}, 1-u-g_t)(1-u-g_t) \quad (2) \\ = \; & 1-u \quad (3) \end{aligned}$$

ψ_{t+1} is therefore a function of u, g_{t+1}, and g_t:

$$\begin{aligned} \psi_{t+1} &= \psi(u, g_{t+1}, g_t) \quad (4) \\ &= \frac{1-u-\phi(u, g_{t+1}, g_t)g_t - \phi(u, 1-u-g_{t+1}, 1-u-g_t)(1-u-g_t)}{u} \end{aligned}$$

Before we proceed, we should make the following point: by making the above assumptions, we have deliberately eliminated two mechanisms that will affect the preferences for government spending. First, because unemployment is constant, government spending does not generate jobs in the aggregate. That would not be the case if there were decreasing returns to private production, in which case government spending would allow for higher wages and lower unemployment, or if (1) was specified in terms of post-tax wages, in which case higher taxes would increase wage pressure and thus unemployment. In many models of wage rigidity, there is scope for the government to boost aggregate employment via public employment, and this is often desirable from a welfare point of view as there is a wedge between the private and social cost of labor.[6] But this effect would show up as a common component to everybody's utility function and would not be associated with political conflicts; it is therefore independent of the effects studied here. In the Appendix, we extend the model to allow for an effect of public spending on aggregate employment, and show that under certain conditions this effect increases the desired level of spending, but does not affect its dynamics.

Second, all agents pay the same tax and enjoy the same level of public good, so that there is no redistributive motive for government spending.

[6]See, for example, Bulow and Summers (1986), and Broadway, Marchand and Pestieau (1990), for similar points.

These simplifications allow to isolate the mechanism in which we are interested, namely that under imperfect labor markets the sectorial composition of employment affects the balance of power in collective decisions.

2.3 The Political Equilibrium

We now describe how public spending is determined by majority voting.

At the beginning of period t+1, the individual preferences for public spending θ_{it+1} are drawn from a distribution with c.d.f. $F(\theta, t+1)$. People then decide, by majority voting, on the level of spending g_{t+1} which will prevail during period t+1. Labor reallocation then takes place according to the process described above.

Givenr our assumption of myopic agents, agent i determines its preferred tax rate by maximizing:

$$Max_{g_{t+1}} \theta_{it+1} g_{t+1} - b g_{t+1}^2/2 - g_{t+1} + \phi_i(g_{t+1}) = V_{it+1}(g_{t+1}), \qquad (5)$$

where $\phi_i(g_{t+1})$ is the probability of being unemployed, namely $\phi(u, g_{t+1}, g_t)$ for an employee of the public sector, $\phi(u, 1-u-g_{t+1}, 1-u-g_t)$ for an employee of the private sector, and $\psi(u, g_{t+1}, g_t)$ for an unemployed worker.

It is useful to consider what would happen in the absence of unemployment. Then, for the same value of θ, people have the same preferences with respect to public spending regardless of which sector they work in. That is, they vote according to their true preferences for public goods regardless of their current labor market status. Because of the concavity of the utility function, preferences are single peaked. There exists a political equilibrium determined by the preferences of the median voter. Accordingly the equilibrium level of government spending is determined by:

$$g_{t+1} = \frac{\theta_{mt+1} - 1}{b}$$

, where θ_{mt+1} is the median in the distribution $F(\theta, t+1)$. Note that past levels of government spending have no impact on current government spending.[7]

3 Unemployment, voting, and churning

When there is unemployment, people no longer vote according to their "genuine" preferences. They also take into account the impact of government spending on their own probability of getting a job. This will lead public sector employees to favor more government spending relative to their genuine preferences, and private sector employees to want less government spending. Boosts in government spending increase public employment and reduce private employment, thus increasing the probability of being employed for public employees but lowering it for private employees.

To see this formally, consider the marginal impact of government spending on utility for a given θ. For a government employee, it is equal to:

$$V'_{it+1}(g_{t+1}) = \theta - bg_{t+1} - 1 + \phi'_2\left(u, g_{t+1}, g_t\right) > \theta - bg_{t+1} - 1$$

For a private employee it is:

$$V'_{it+1}(g_{t+1}) = \theta - bg_{t+1} - 1 - \phi'_2\left(u, 1-u-g_{t+1}, 1-u-g_t\right) < \theta - bg_{t+1} - 1$$

Therefore, when voting, each sector will behave according to an "organizational", or "pork-barrel", logic, tending to increase its own size relative to what is desirable from a strict welfare point of view. For the public sector, this means more taxes; for the private sector, less taxes. Since everybody pays the same tax and equally benefits from the public good, this logic does not arise, contrary to most of the earlier literature, from a redistributive motive. It is the people's desire to protect their jobs in a world with unemployment which leads the employees of a sector to vote in such a way to boost the activity of that sector.

[7] They would obviously have an impact if the distributions of θ were serially correlated, which we have ruled out here, thus isolating unemployment as a sole source of persistence.

How do, now, the unemployed vote? Differentiating (5) and using (4), one gets:

$$
\begin{aligned}
V'_{it+1}(g_{t+1}) &= \theta - bg_{t+1} - 1 + \psi'_2(u, g_{t+1}, g_t) \\
&= \theta - bg_{t+1} - 1 \qquad (6)\\
&\quad + \frac{(1-u-g_t)\phi'_2(u, 1-u-g_{t+1}, 1-u-g_t) - g_t\phi'_2(u, g_{t+1}, g_t)}{u}
\end{aligned}
$$

This formula has several implications. First, the unemployed's preferences are not necessarily single-peaked. One can trivially show, however, that a sufficient condition for them to be concave is:

ASSUMPTION (A2)

$$\max \|\phi''_{22}\| < \frac{bu}{1-u}$$

Second, the impact of government spending on the unemployed's probability of finding a job may be positive or negative, and depends in a non trivial way on the initial level of spending g_t. However, if ϕ''_{23} is not too negative, the last term of (6) will be decreasing in g_t. So, relative to their intrinsic preferences, the unemployed will favor government spending if g_t is small, in which case the numerator of the last term in (6) is positive, and they will oppose it if it is large, in which case this term is negative. Therefore, the unemployed are *radical;* they are in favour of *change.* They want high spending when it is low, and low spending when it is high. Change, by reallocating more jobs, increases their chances of getting one. This is what we call the *churning effect.* We shall see how the churning effect may lead to policy *instability* by generating negative persistence and cycles in government spending, and possibly non-single-peaked preferences for the unemployed.

When will there be such a churning effect? One can straightforwardly show that:

PROPOSITION 1 - A sufficient condition for the unemployed's preferred spending level, $g^u_{t+1}(\theta)$, to be decreasing in g_t is:

$$\frac{\partial}{\partial g_t}\left(g_t \phi_2'(u, g_{t+1}, g_t)\right) > 0, \forall u, g_{t+1}, g_t \tag{7}$$

PROOF: Differentiating the last term of (6) we see that $\partial g_{t+1}/\partial g_t < 0$ if and only if

$$\begin{aligned} 0 \quad > \quad & -\phi_2'(u, g_{t+1}, g_t) - g_t \phi_{23}''(u, g_{t+1}, g_t) \\ & -\phi_2'\left(u, 1-u-g_{t+1}, 1-u-g_t\right) \\ & -(1-u-g_t)\phi_{23}''\left(u, 1-u-g_{t+1}, 1-u-g_t\right) \end{aligned}$$

, which is true if the above assumption holds.

Condition (7) means that the aggregate marginal employment probability of a given sector's employees is increasing in the initial size of that sector. It implies that gross job flows are bigger when one job is destroyed in the big sector and one job created in the small sector, than if the converse change is made. In this case, the unemployed, who benefit from job creation but do not lose from job destruction, will favor high spending when it is initially low, and low spending when it is initially high, because this is what leads to high job creation.

Note that there is no churning effect absent an insider effect (i.e. if $\phi_2' \equiv 0$). The churning effect is the flip side of the insider effect: reallocation is liked by the unemployed because in the absence of it, the employed have priority to retain their jobs. Absent the insider effect, all the above derivatives of ϕ are equal to zero, and spending has no effect on the probability of being unemployed; people vote, again, according to their intrinsic preferences and the equilibrium value of g_{t+1} is the same as in the no unemployment case.

How plausible is the churning effect? I argue that a natural functional form for ϕ is $\phi(u, g_{t+1}, g_t) \equiv \omega(u, g_{t+1}/g_t)$, where ω is concave in its second argument. This implies that, given the unemployment rate, a 10 % increase in employment will have the same impact on the probability of remaining employed regardless of the initial size of the sector. Concavity means that the gains to the incumbents of employment growth in terms of job security are bounded as employment growth becomes large: beyond a certain growth level for my sector, I'm almost sure to keep my job.[8] It can then be straightforwardly checked that condition (7) holds for that functional form as long as ω''_{22} is strictly negative.

For simplicity, however, we shall also consider a simpler, linear specification given by:[9]

$$\phi(u, g_{t+1}, g_t) = 1 - u + au(1 + g_{t+1} - g_t) \tag{8}$$

The parameter a measures the intensity of the insider effect: the higher a, the lower the mobility between employment and unemployment, and the more sensitive my probability of being employed tomorrow to tomorrow's employment in my current sector. Note that a is also a measure of unemployment duration: in a steady state with $g_{t+1} = g_t$, the higher a, the lower the exit rate from unemployment and the longer unemployment duration, given u.

This specification also generates a churning effect, since ϕ'_2 is constant, implying that (7) trivially holds. The unemployed's probability of finding a

[8]An extreme case is $\omega = \max(g_{t+1}/g_t, 1) + (1 - \max(g_{t+1}/g_t, 1)).\gamma(u)$. In this case the worker is sure to keep his job if the sector does not shrink. If the sector shrinks, random firing occurs. The worker loses his job with probability $(1 - g_{t+1}/g_t)$,in which case he ends up in the private sector with probability $\gamma(u), \gamma' < 0$.

Under this extreme reallocation scheme, ω is piecewise linear and concave in g_{t+1}/g_t. A smooth, concave ω can then be obtained if one assumes that the public sector can be broken down into a large number of sub-sectors, each of which reallocates jobs according to the above equation. Provided the aggregate public employment growth rate g_{t+1}/g_t is randomly allocated across the sub-sectors, this will generate an aggregate function $\omega(u, g_{t+1}/g_t)$ which will typically be concave in g_{t+1}/g_t.

[9]The functional forms that we shall use for ϕ will satisfy all the required properties, except the boundary counditions. For example, here we do not have $\phi(1, ., .) = 0$. This is a minor problem, since we confine ourselves to values of u in the interior of]0,1[.

job is given by:

$$\psi = (1-u)(1-a) + a(1-u-2g_t)(g_{t+1} - g_t) \tag{9}$$

The churning effect is apparent from (9). ψ is increasing in g_{t+1} if spending is low initially ($g_t < (1-u)/2$), and decreasing if it is initially high ($g_t < (1-u)/2$). Note that the churning effect is multiplicative in a, which measures the intensity of the insider effect. When a goes to zero everybody has the same probability of finding a job.

Let us summarize this section: public sector employees favor a spending level above that corresponding to their intrinsic preferences. Private sector employees favor a spending level below their intrinsic one. And, under the plausible condition that (7) holds, the unemployed favor a high spending level if it is initially low, and a low level if it is initially high.

4 The political equilibrium

We now study the determination of the equilibrium level of government spending. Under assumption (A2), all preferences with respect to g_{t+1} are concave and therefore single-peaked.

Given single peakedness, equilibrium is determined by the preferences of the median voter. Provided the distribution of θ has a wide enough support, within each group, there exists a marginal voter whose preferred tax rate is equal to the equilibrium one. Let θ_g, θ_p, and θ_u be the value of θ which characterizes the marginal voter within the public employees, private employees, and unemployed, respectively. Then in equilibrium the total number of people who prefer more (or less) spending than these marginal voters must be equal to exactly 0.5. Thus:

$$F(\theta_g, t+1)\, g_t + F(\theta_p, t+1)(1-u-g_t) + F(\theta_u, t+1)\, u = 0.5 \tag{10}$$

The marginal θ's are determined by the requirement that the corresponding derivative is equal to zero at the equilibrium value of g_{t+1} :

$$\theta_g = bg_{t+1} + 1 - \phi_2' \left(u, g_{t+1}, g_t\right) \tag{11}$$

$$\theta_p = bg_{t+1} + 1 + \phi_2' \left(u, 1-u-g_{t+1}, 1-u-g_t\right) \tag{12}$$

$$\begin{aligned}\theta_u &= 1 + bg_{t+1} & (13)\\ &+\frac{g_t\phi_2' \left(u, g_{t+1}, g_t\right) - (1-u-g_t)\phi_2' \left(u, 1-u-g_{t+1}, 1-u-g_t\right)}{u} & (14)\end{aligned}$$

Hence, plugging these three identities into (23), we get an equation for g_{t+1}.

5 A neutrality result

Let us now consider what happens when the distribution is uniform. The the following neutrality result can be established:

PROPOSITION 2: Assume the cumulative distribution of θ *is* $F(\theta, t+1) = \left(\theta - \bar{\theta} + \sigma\right)/2\sigma$. *Then, as long as there is a decisive voter within each of the three groups,* g_{t+1} *does not depend on* g_t *and is equal to the level which maximizes aggregate welfare:*

$$g_{t+1} = \frac{\bar{\theta} - 1}{b} = g_I \tag{15}$$

PROOF: We can rewrite the equilibrium condition as:

$$\begin{aligned}& bg_{t+1} + 1 - g_t\phi_2' \left(u, g_{t+1}, g_t\right) + \left(1-u-g_t\right)\phi_2' \left(u, 1-u-g_{t+1}, 1-u-g_t\right)\\ & +u\left(g_t\phi_2' \left(u, g_{t+1}, g_t\right) - (1-u-g_t)\phi_2' \left(u, 1-u-g_{t+1}, 1-u-g_t\right)\right)/u\\ =\ & \bar{\theta}\end{aligned}$$

The derivatives of ϕ all cancel out, so this is equivalent to (15). Q.E.D.

Therefore, under a uniform distribution, government spending does not depend on the initial allocation of the workforce between the public and the private sector, and is exactly equal to its level in the absence of unemployment.

5.1 Discussion

The neutrality result is due to the fact that the aggregate effect of government spending on job creation must be equal to zero (equation (2)). A casual intuition is as follows: under a uniform distribution, the mean is equal to the median, so that voting is equivalent to maximization of aggregate welfare (the sum of utilities). Since the aggregate probability of being employed at $t+1$ is constant and equal to $1-u$, it all boils down to maximizing the "intrinsic" part of aggregate welfare. Hence government spending is determined by the average intrinsic preferences for the public good regardless of the initial state of the labor market.

This rings the truth, but is only an approximation. Because the labor force is split in three groups, the distribution of preferred levels of spending is *not* uniform, even though intrinsic preferences are uniformly distributed. What is going on is that the distribution of preferred spending levels is a convolution of a uniform distributions with a 3-mass distribution, and this distribution has the property that if the median is interior to all three distributions then it is equal to the mean. But when the pivotal voter within one group is no longer interior, the neutrality result disappears.

The neutrality result would also hold if government spending had an effect on aggregate unemployment, in the sense that it would be equal to the one that maximizes aggregate welfare, and would not depend on the initial composition of the workforce. Government spending would be different, however, from its level in the absence of unemployment, because it is socially desirable to take into account its effect on total employment. (See the appendix for a model where government spending affects aggregate employment).

The above intuition for the neutrality result is more mathematical than economic. The proper economic intuition in fact depends on the properties of the ϕ function.

Suppose for example that we have $\phi(u, g_{t+1}, g_t) = a + cg_{t+1}/g_t$. Then, as may be checked from (2), the unemployed's probability of finding a job is a constant, equal to $\psi = (1-u)(1-a-c)/u$. So, there is no churning effect (even though there is an insider effect) and the unemployed vote according to their intrinsic preferences. Second, the public employees' preferred spending level is given by, as a function of θ:

$$(\theta - 1 + c/g_t)/b = g_{t+1}(\theta) \tag{16}$$

A similar formula holds, mutatis mutandis, for the private sector employees. The neutrality result then comes from the cancelling of two effects: a political support effect and a preference effect. When there are more public employees initially, there is more support for a spending level higher than the intrinsic one (the political support effect). But the marginal gain to a public employee of an additional unit of government spending goes down when initial government spending is higher (the preference effect: g_{t+1} falls with g_t in (16)). So, more people want a spending above the intrinsic one, but the size of the gap falls. In the aggregate the two effects cancel each other and g_{t+1} does not depend on g_t.

Let us now assume that ϕ is specified in difference terms, as in (8): $\phi(u, g_{t+1}, g_t) = 1 - u + au(1 + g_{t+1} - g_t)$. We have seen that this specification is associated with a churning effect. The public employees' preferred spending is equal to $(\theta - 1 + au)/b = g_{t+1}(\theta)$, while in the private sector one has $g_{t+1}(\theta) = (\theta - 1 - au)/b$.

Neutrality then has a quite different economic intuition relative to the ratio model. More public employees increase the support for higher spending, and there is no offsetting effect from their own preferences. The offsetting effect comes from the unemployed, who like government spending less when it is higher initially.

If now $\phi \equiv \omega(u, g_{t+1}/g_t)$, with ω strictly concave in its second argument, both effects are present: the political support effect is offset partly by the churning effect (since (7) holds) and partly by the negative impact of g_t of the individual marginal probability of being employed (ϕ''_{23} negative). More generally, these two effects will be present as long as ϕ''_{23} is negative but larger than -ϕ'_2/g_t.

6 Persistence

How, then, can we get an effect of the initial level of government spending on future spending? One way is to assume a non uniform distribution. Before we study that case, we first analyze what happens when the unemployed do not vote. In both cases, the central result which emerges from the analysis is that when the unemployed are 'politically unimportant' at the margin, positive persistence will dominate. By 'politically unimportant' we mean that there are few unemployed voters, relative to employed voters, who would switch sides when policy is changed marginally.

6.1 Lower political participation by the unemployed

In this section, we analyze the consequences of a lower political participation by the employed. There are two motivations for this. First, there is an abundant literature to show that the poorest and disenfranchised participate much less in the electoral process.[10] Second, a fair share of decision making is the outcome of lobbying activities rather than direct voting. While this would call for a totally different model, part of the aspects of lobbying are captured by assuming that the employed carry more power than the unemployed — as argued, among others, by Olson (1982), many organized interests find in

[10] See, for example, Petrocik and Shaw (1991).

the workplace a natural place to coordinate, and the unemployed obviously have no access to this collusion technology. Thus a natural way to interpret the assumption that the unemployed do not vote is that the employed vote among themselves (within a single union), and then the union has enough coercive power to impose its choice on the government.

In the linear specification we just considered, the reaction by the unemployed was offsetting the political support effect. Obviously, this disappears when the unemployed do not vote, so that there will be *positive persistence* of government spending: more spending generates more civil servants, who make a larger constituency in favor of more spending.

6.1.1 The unemployed don't vote

To see this formally, note that if the unemployed don't vote, then (23) is replaced with:

$$F\left(\theta_g, t+1\right) g_t + F\left(\theta_p, t+1\right)\left(1-u-g_t\right) = 0.5(1-u) \tag{17}$$

The decisive voter is now the median within the employed. Using the linear specification (8) for ϕ we see that:

$$\theta_g = b g_{t+1} + 1 - au$$

and:

$$\theta_p = b g_{t+1} + 1 + au$$

Plugging these two equations into (17) and assuming a uniform distribution $F(\theta, t+1) = \left(\theta - \bar{\theta} + \sigma\right)/2\sigma$, we find that government spending follows an AR1 process given by:

$$g_{t+1} = \lambda g_t + \bar{g}$$

, with $\lambda = (2au)/(b(1-u))$ and $\bar{g} = (\bar{\theta} - 1 - au)/b$. The autoregressive coefficient is higher, the larger the insider effect a, and the larger the unemployment rate u. Note that beyond a certain level, government spending becomes explosive, thus eventually reaching one of its boundaries. This will occur if $\lambda > 1$, i.e. $u > b/(2a + b)$.

6.1.2 Lower participation by the unemployed

We can easily extend the model by assuming a participation rate ρ of the unemployed in the electoral process. (17) is now replaced with

$$F(\theta_g, t+1)\, g_t + F(\theta_p, t+1)(1 - u - g_t) + F(\theta_u, t+1)\rho u = 0.5(1 - u + \rho u)$$

, and $\theta_u = b g_{t+1} + 1 - a(1 - u - 2g_t)$. We now get:

$$g_{t+1} = \lambda' g_t + \bar{g}'$$

,with $\lambda' = (2au(1-\rho))/(b(1-u+\rho u))$ and $\bar{g} = (0.5\sigma + \theta_0 - 1 - au(1-\rho)(1-u)/(1-u+\rho u))/b$. We get the additional result that the persistence coefficient negatively depends on the unemployed's participation rate: there is less inertia in public policy when the unemployed participate more in the political process.

Provided spending is not explosive, how is the long run level of spending, g_∞, determined? Going back to the $\rho = 0$ case, we have

$$g_\infty = \bar{g}/(1-\lambda) = g_I + \frac{au(2g_I - (1-u))}{b(1-u) - 2au}$$

, where $g_I = \frac{\bar{\theta}-1}{b}$ is the "intrinsic", no unemployment, spending level. Therefore, spending will be above (below) g_I if g_I is above (below) $(1-u)/2$. High unemployment (and low mobility) leads to bigger government in a society which intrinsically likes it, and to a smaller one in a society which intrinsically dislikes it.

6.1.3 Unemployment benefits

What happens when there are unemployment benefits (still financed by lump-sum taxes paid by everybody) which pay an income equal to η to the unemployed? Intuitively, keeping one's job is a less important issue so that aggregate decision making will be closer to the intrinsic equilibrium.

To see this, note that (5) becomes:

$$Max_{g_{t+1}}\ \theta_{it+1}g_{t+1} - bg_{t+1}^2/2 - g_{t+1} + \phi_i(g_{t+1})(1-\eta) + 1 = V_{it+1}(g_{t+1})$$

Clearly, η lowers the contribution of the insider effect to the preferences governing government spending. We now have:

$$\theta_g = bg_{t+1} + 1 - au(1-\eta)$$

and:

$$\theta_p = bg_{t+1} + 1 + au(1-\eta)$$

, so that $\lambda = (2au(1-\eta))/(b(1-u))$ and $\bar{g} = (\bar{\theta} - 1 - au(1-\eta))/b$. The autoregressive coefficient is lower, the higher the benefit replacement ratio η.

6.2 Non-uniform distribution

We now analyze the solution under a non uniform distribution. We start with an example that can be explicitly computed. We have used an exponential distribution $F(\theta) = e^{m\theta} - c$ for $\theta \in [(\ln c)/m, \ln(1+c)/m]$. We again assume that ϕ is given by (8), the difference model. We can then rewrite (23) as:

$$g_t e^{m(bg_{t+1}+1-au)} + (1-u-g_t)\, e^{m(bg_{t+1}+1+au)} + ue^{m(bg_{t+1}+1-a(1-u-2g_t))} \quad (18)$$
$$= \quad 0.5 + c \quad (19)$$

This allows to explicitly compute g_{t+1} as a function of g_t. Differentiating (18) we find:

$$\frac{dg_{t+1}}{dg_t} = \frac{e^{m(bg_{t+1}+1)}}{mb(0.5+c)}\left[e^{mau} - e^{-mau} - 2amue^{-ma(1-u-2g_t)}\right]$$

This is first positive and then negative. g_{t+1} therefore first rises and then falls with g_t. This is illustrated on figure 1. Whether persistence is positive or negative around the steady state therefore depends on where that steady state is. If it is associated with a level of g not too high, then there will be positive persistence; otherwise, persistence will be negative.[11]It can also be shown that, as unemployment increases, the point where dg_{t+1}/dg_t changes sign shifts left, so that negative persistence is more likely: the more numerous the unemployed, the more likely they are to be decisive politically, the more likely is negative persistence.

The shape of figure 1 may be explained as follows. The distribution implies a higher density of θ as it is rising, implying, among other things, that the distribution is skewed to the left: the median voter likes government spending more than the mean. Because of the churning effect, the unemployed like spending less as initial spending g_t increases. As a result, the decisive voter within the unemployed group becomes more "liberal" (in favor of spending), as initial spending increases, meaning that more and more unemployed support a lower spending level. At low spending levels, however, the unemployed are politically unimportant (at the margin) because the density of people around the unemployed decisive voter is low. Political dynamics are dominated by the employed: when initial spending increases, there are more employed workers in favor of higher spending than unemployed workers in favor of lower spending, which generates positive persistence. Because the density is increasing in θ, the contrary happens at high initial spending levels: the density around the liberal unemployed decisive voter is high and the unemployed are politically more important, at the margin, than the employed. As initial spending increases the number of unemployed people who now favor lower spending is large enough to dominate the political support effect coming from the employed. Therefore, there is negative persistence.

The above argument does not rest on the particular functional form as-

[11]Mathematically, it can be shown by simply looking at this expression that dg_{t+1}/dg_t is positive for $g_t = 0$ provided $u < 0.5$, and always negative for $g_t = 1$. Nothing can be said as to whether the steady state is in the positive persistence or the negative persistence zone. To see this, just note that the sign of dg_{t+1}/dg_t does not depend on c, while any steady state value of g can be attained by assuming the appropriate value of c.

sumed for the distribution. The two following propositions generalize it:

PROPOSITION 3: Assume $\phi''_{23} = 0$. *Then* $dg_{t+1}/dg_t > 0$ *if and only if:*

$$f(\theta_u) < \frac{F(\theta_p) - F(\theta_g)}{\theta_p - \theta_g} \tag{20}$$

PROOF: see appendix.

This proposition tells us the following: the RHS is the average density of employed agents who would switch preferences if they changed jobs. That is, these are the agent's types who prefer more spending than g_{t+1} when working in the public sector, but less when working in the private sector. The proposition then tells us that if, on average, these agents are more "numerous" than the pivotal unemployed workers, then an increase in g_t will generate a stronger support for higher spending within the employed than the corresponding decline in this support within the unemployed. Therefore, the proposition tells us that when the unemployed, at the margin, are less decisive than the employed, there will be positive persistence.

The next proposition tells us that for a unimodal distribution of θ, the typical dependence of g_{t+1} on g_t is as represented of figure 2:

PROPOSITION 4: Assume ϕ *is given by (8). Assume the density of* θ, f, *has a single mode* $\hat{\theta}$, *with* $f'(\theta) > 0$ *for* $\theta < \hat{\theta}$ *and* $f'(\theta) > 0$ *for* $\theta < \hat{\theta}$. *Then:*

(i) There exists $\underline{g} < 0.5 - u$ *such that* $\partial g_{t+1}/\partial g_t > 0$ *for* $g_t < \underline{g}$.

(ii) There exists $\bar{g} > 0.5$ *such that* $\partial g_{t+1}/\partial g_t > 0$ *for* $g_t > \bar{g}$

(iii) There exists $g^* \in [0.5 - u, 0.5]$ *such that* $\partial g_{t+1}/\partial g_t = 0$ *for* $g_t = g^*$

PROOF: see appendix.

7 Unemployment and political instability

The above results rest on the assumption that the churning effect is not strong enough to generate non single peaked preferences for the unemployed. If there is enough concavity of ϕ with respect to g_{t+1}, then the unemployed's preferences may be non single-peaked: they will prefer very large and very small spending levels relative to intermediate ones.

In this section, we analyze what happens when such single peaked-ness disappears, assuming ϕ is quadratic in g_{t+1}/g_t. We show two results: first, under a uniform distribution, there still is a political equilibrium and it remains identical to the one that maximizes aggregate welfare. The neutrality result still holds. Second, under a non-uniform distribution, there is no equilibrium if the unemployed are marginally politically more important than the employed.

The unemployed's preferences are concave with respect to g_{t+1} both in the ratio model and the difference model. This may no longer be true, however, for the concave-in-ratio model. Let us assume the following quadratic specification for ϕ :

$$\phi(u, g_{t+1}, g_t) = 1 - u + au\left[\frac{g_{t+1}}{g_t} - \frac{c}{2}\frac{g_{t+1}^2}{g_t^2}\right]$$

The unemployed's probability of finding a job is:

$$\psi = (1-u)(1-a) + \frac{ca}{2}\left(\frac{g_{t+1}^2}{g_t} + \frac{(1-u-g_{t+1})^2}{1-u-g_t}\right)$$

It is therefore *convex* in g_{t+1}. The maximum rate of job creation for the unemployed is obtained by either eliminating the public sector or having it eating the rest of the economy.

It is then possible to prove the following result:

PROPOSITION 5: (i) The unemployed's preferences are convex, and therefore non-single peaked, if and only if

$$b < \frac{ca}{g_t} + \frac{ca}{1-u-g_t}$$

(ii) However, if F is uniform, then there exists a unique voting equilibrium which maximizes aggregate welfare under intrinsic preferences:

$$g_{t+1} = g_I = \frac{\bar{\theta} - 1}{b}$$

(iii) Let $A_g = (b + cau/g_t^2)$; $B_g = 1 - au/g_t$; $A_p = b + cau/(1-u-g_t)^2$; $B_p = 1 + au/(1-u-g_t) - cau(1-u)/(1-u-g_t)^2$; $A_u = ca/g_t + ca/(1-u-g_t) - b$; $B_u = 1 + ca(1-u)/(1-u-g_t)$.

Then, any voting equilibrium must yield a value of g_{t+1}, g^*_{t+1} *which satisfies:*

$$g_t F(\theta_g) + (1-u-g_t)F(\theta_p) + uF(\theta_u) = 0.5 \tag{21}$$

, with $\theta_g = A_g g_{t+1} + B_g$, $\theta_p = A_p g_{t+1} + B_p$, $\theta_u = -A_u g_{t+1} + B_u$.

(iv) If at any point such that (21) is satisfied, the following inequality holds:

$$A_g g_t f(\theta_g) + (1-u-g_t)A_p f(\theta_p) < A_u u f(\theta_u)$$

, then there is no voting equilibrium.

PROOF: See appendix.

The first part of proposition 5 tells us that the unemployed will be more "extremist" when unemployment is higher and when initial government spending is closer to its extreme values 0 and $1-u$. The second part tells us that, nevertheless, convexity in the unemployed's preferences does not make the neutrality result go away. Loosely speaking, this is because the unemployed will be more "radical", the stronger the churning effect (say a higher). But the churning effect can only be stronger if the insider effect is stronger, which makes the employed more "conservative", enough so to ensure that any deviation from the intrinsic spending level is defeated in a majority vote. The LHS of equation (21) consists of three terms: the number of private employees, public employees and unemployed workers, respectively, who favor a spending level lower than g_{t+1}. While the first two groups are increasing with g_{t+1}, the latter is actually decreasing: there will be more unemployed people in favor of more extreme policies. This introduces a destabilizing component which, if it were to prevail, would destroy equilibrium since the median voter's preferred policy would then be defeated. The last part of proposition 5 tells us that if the density of decisive unemployed voters is large enough, relative to the density of decisive employed voters, then the destabilizing contribution of the unemployed's vote will outweigh the stabilizing contribution of the employed and no equilibrium exists.

8 Some evidence

The main message of the paper is that the existence of unemployment changes the dynamic structure of government spending. Typically, we expect the employed to be more powerful than the unemployed, so that unemployment will create resistance to change. One possible way to test for that would be to look at the time series behaviour of government spending, relative to trend GDP. However, the main argument of this paper certainly does not apply to routine changes in government spending, that are typically very small and therefore unlikely to be associated with political conflicts over their effects on employment. For example, in the sample of OECD countries that we use, changes in government spending between two subsequent years on average amount to less than 0.5 % of GDP, in absolute value. This point is reinforced by the fact that most of these changes are routinely implemented by incumbent governements who do not face an election.

To test the model, we therefore concentrate on events where substantial change occur. We do this in two ways.

First, we ask the following question: how high is unemployment at times of *large* changes in public spending?[12] The answer is that it is in general low, relative to the country's average. Table 1 shows average unemployment deviation at date $t-1$, provided spending changes by an absolute magnitude at least equal to some threshold between $t-1$ and t. We use a panel of OECD countries, with yearly data on spending and unemployment rates

[12] Ideally, one would prefer to use data on unemployment duration rather than on unemployment, since unemployment duration better controls for cross-country differences in the insider effect, but panel data on unemployment duration are not available.

between 1960 and 1993.[13] We see that unemployment is significantly lower than average for these episodes, regardless of the threshold being picked up. The higher the threshold, the lower average unemployment for the episodes being selected. This suggests that substantial reforms are more likely to occur at low unemployment rates, which is in accordance to the above discussion provided the employed are politically more influential than the unemployed.[14]

The second way is to use data on the government's political stance and define episodes of substantial change as changes in the political composition of the government.[15] Table 2 reports estimates for a probit model for the probability of a change in the political orientation of the government. In addition to the unemployment rate, we have used variables describing the state of the macroeconomy as controls. These include the inflation rate, budget surplus, and gross government debt in the year preceding the political change. Country fixed effects were included.

One might have believed that unemployment makes a governmental change more likely. This regression suggests, in accordance with the paper's idea that unemployment actually increases resistance to change, that on average governments change less often at times of high unemployment. Also note that the budget variable has the right negative sign, which is typically significant, while the two other macro variables are essentially insignificant.

To conclude this section, the evidence broadly supports the idea that higher unemployment creates sluggishness in government spending and op-

[13]The countries are: Australia, Austria, Belgium, Canada, Germany, Denmark, Finland, France, United Kingdom, Italy, Japan, Netherlands, Norway, Sweden, USA. The unemployment and spending variables are from the *OECD Economic Outlook* database, the spending variable being defined as the change in government spending divided by trend DP, where trend GDP is defined using a Hodrick-Prescott filter with the usual parameter of 100.

[14]This may not be true of reforms that are specifically designed to alter labor market institutions, which may be more viable when the employed are exposed to unemployment; see Saint-Paul (1993,1996b).

[15]We have used the dummy constructed by Alesina and Roubini (1997), which is equal to +1 if the government is right-wing and -1 if it is left-wing.

position to reform. This evidence should obviously be complemented by further empirical work, but this is beyond the scope of this paper, which is mainly theoretical.

9 Conclusion

We have studied, in a model with unemployment, how labour market status affects the preferences for public spending, whether in the form of a public good or subsidies. We have then derived the implications for the dynamics of government expenditures, and provided some evidence suggesting that the channels identified here are empirically relevant . Our main findings are the following:

First, we find that while employed workers have a bias towards the sector where they are employed, the unemployed have a bias towards the smallest sector. While the first want to preserve their jobs due to the insider effect, the second want large changes in government policy in order to benefit from the churning effect.

Second, under a uniform distribution of tastes regarding public spending, sufficient dispersion in that distribution will ensure that there exists a decisive voter within each group and we can then show that public spending does not depend on the sectorial composition of employment. In our model, it is equal to the one that would prevail absent unemployment.

Third, there will be positive persistence if the employed are politically more decisive than the unemployed, and negative persistence if the converse holds. The first case will typically dominate if the unemployed participate less than the employed in the political process. Otherwise, whether persistence is positive or negative typically depends on the local density of pivotal voters within the employed vs. within the unemployed.

Fourth, unemployment may generate political instability because the unemployed's preferences will be non single-peaked. A voting equilibrium may then fail to exist.

The principles we have studied are quite general and do not depend on what particular policy is studied. The general point is that when there is unemployment and an insider effects, the employed of a given sector will tend to block any reform which reallocates employment from their sector to the rest of the economy. Thus, if the employed are dominant in decision making, "Eurosclerosis" is reinforced by the unemployment it generates.

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Appendix

The subsidy game

As in the model studied in the text, wage formation is described by equation (1). For simplicity, we assume that the wage entering equation (1) is the real wage in terms of the numéraire, taken to be the consumption good. Both goods are produced using a constant returns production function with a unit coefficient. Therefore, $w_t = 1$, implying a constant unemployment level u. Let p_t be the price to the consumer of the subsidized good g. Then, perfect competition among firms ensures that $p_t = 1 - s_t$, where s_t is the subsidy level. We assume the same utility function as in the text, with myopic voting and no intertemporal transferability of consumption. Therefore, consumers maximize each period:

$$\theta g_t - b g_t^2/2 + c_t$$

, under the following budget constraint:

$$p_t g_t + c_t = R_t$$

, where R is their income net of the lump-sum tax used to finance the subsidy.

A consumer with type θ will therefore consume the following quantities:

$$g_t(\theta) = \frac{\theta - 1 + s_t}{b}$$

and:

$$c_t(\theta) = R_t - (1 - s_t)\frac{\theta - 1 + s_t}{b}$$

Everybody pays a lump-sum tax T_t. The balanced budget condition implies:

$$T_t = s_t \int g_t(\theta) f(\theta) d\theta = s_t \frac{\bar{\theta} - 1 + s_t}{b}$$

, where $\bar{\theta}$ is the average value of θ. Income is then $R_t = 1 - T_t$ for the employed and $-T_t$ for the unemployed. We can then compute the utility of an employed worker with a preference θ for the subsidized good as a function of the subsidy rate:

$$V_e(\theta, s) = \frac{(\theta - 1 + s)^2}{2b} - s\frac{\bar{\theta} - 1 + s}{b} + 1$$

, while the corresponding utility for an unemployed worker is $V_u(\theta, s) = V_e(\theta, s) - 1$.

The timing of the game is as in the text: people first vote on the subsidy rate for $t+1$; job reallocation then takes place according to the mobility functions. Consider, for example, the preferred subsidy rate of an employee in the subsidized sector. That person will maximize $\phi(u, \bar{g}_{t+1}, \bar{g}_t)V_e(\theta, s) + (1 - \phi(u, \bar{g}_{t+1}, \bar{g}_t))V_u(\theta, s)$ with respect to s_{t+1}, with $\bar{g}_t$ equal to aggregate employment in the subsidized sector, i.e.:

$$\bar{g}_t = \int g_t(\theta) f(\theta) d\theta = \frac{\bar{\theta} - 1 + s_t}{b}$$

The first-order condition is thus:

$$s_{t+1} = s_{t+1}(\theta) = \theta - \bar{\theta} + \phi_2'(u, \bar{g}_{t+1}, \bar{g}_t)$$

The first term $\theta - \bar{\theta}$ is the contribution of the intrinsic preferences for the subsidy. People will want to subsidize good g provided their like it more than average. The last term is the contribution to their job security, which is the same as in the text.

This first order condition can be rewritten in terms of $\bar{g}_{t+1}$, which gives:

$$\theta - 1 - b\bar{g}_{t+1} + \phi_2'(u, \bar{g}_{t+1}, \bar{g}_t) = 0$$

Hence, if we replace g_t with $\bar{g}_t$, the analysis can then be carried out in a way exactly identical to the model of the text.

Effect of spending on aggregate unemployment

We now study what happens when government spending affects aggregate unemployment. We assume that instead of being constant unemployment at date $t+1$ is a function $u(g_{t+1})$. We consider the case where $-1 \leq u' \leq 0$. We assume to simplify that wages are fixed and equal to 1. The $u(.)$ function can be recovered by inverting the marginal product condition $m(1-u_{t+1}-g_{t+1}, g_{t+1}) = 1$, where $m(.,.)$ is the marginal product of labor in the private sector, and where we allow for an external effect of g_{t+1} on productivity in the private sector. In the more standard case with no external effect ($m = m(1-u-g)$) one simply has $u_{t+1} = 1 - l - g_{t+1}$, where $m(l) = 1$. In this case public employment does not crowd out private employment at all, and increases aggregate employment one for one.

The mobility function is now $\phi(u_{t+1}, g_t, g_{t+1})$. The rent to the fixed factor in the private sector is assumed, for simplicity, to be consumed by "capitalists" who do not pay taxes and do not participate in the voting process.

The first-order conditions for each group's preferred spending level are now given by:

$$\theta - bg_{t+1} - 1 + \phi_3'(g) + \phi_1'(g)\, u'(g_{t+1}) = 0$$

, for public employees (where g refers to the vector $(u_t, u_{t+1}, g_t, g_{t+1})$),

$$0 = \theta - bg_{t+1} - 1 - \phi_3'(p) + [\phi_1'(p) - \phi_3'(p)]\, u'(g_{t+1})$$

, for private employees (where p refers to the vector $(u_{t+1}, 1-u_t-g_t, 1-u_{t+1}-g_{t+1})$, and:

$$\begin{aligned} 0 \;&=\; \theta - bg_{t+1} - 1 + \frac{-u'(g_{t+1}) - g_t\,[\phi_3'(g) + \phi_1'(g)\, u'(g_{t+1})]}{u_t} \\ &+ \frac{\phi_3'(p) + [\phi_1'(p) - \phi_3'(p)]\, u'(g_{t+1})}{u_t}(1-u-g_t) \end{aligned}$$

, for the unemployed.

Under a uniform distribution, we then see that if everybody votes the equilibrium spending level is given by:

$$\bar{\theta} - bg_{t+1} - 1 - u'(g_{t+1}) = 0$$

This is the one that maximizes aggregate welfare, taking into account the positive impact of government spending on aggregate employment. While it is affected by the existence of uneployment (there is an extra social value to the jobs it creates, represented by the last term), it does not depend on the initial value of g_t, and therefore the fact that public employment affects total employment does not introduce an extra source of persistence. Neutrality still holds in the sense that past spending does not affect current spending, which is equal to its welfare maximizing level.

What, now, if the unemployed do not vote? It can be seen that equilibrium spending must satisfy the following condition:

$$\begin{aligned}\bar{\theta}(1-u_t) &= (1+bg_{t+1})(1-u_t) + [\phi_3'(p)(1+u'(g_{t+1}))(1-u_t-g_t) - \phi_3'(g)g_t] \\ &\quad -u'(g_{t+1})[\phi_1'(g)g_t + \phi_1'(p)(1-u_t-g_t)]\end{aligned}$$

The first term on the RHS is the contribution of intrinsic preferences. The second term is the contribution of the changes in the job finding probabilities due to changes in *each sector's* employment. It is essentially this contribution that we have studied in the text. Here it is modified because public employment crowds out private employment not one for one, but at a rate given by $(1+u'(g_{t+1}))$. As long as $u' \geq -1$, this term is associated with a conflict of interest between public and private employees (since the two corresponding terms have opposite signs), and generates positive persistence in the spending level. The last term represents the effect of the change in *aggregate* employment on the job finding probabilities. Since the two contributions have the same sign, there is no conflict of interest associated with this term (in the sense that it induces both sectors to prefer a higher than intrinsic spending level). Furthermore, if ϕ is separable in aggregate and sectoral effects, i.e. $\phi(u_{t+1}, g_t, g_{t+1}) = \omega(u_{t+1}) + \xi(g_t, g_{t+1})$,[16] then

[16] Separability can only hold for strictly positive values of u_{t+1} since ϕ has to be equal to 1 regardless of the values of g_t and g_{t+1} when u_{t+1} goes to zero. It is best thought of as holding in an approximate sense.

$\phi_1'(p) = \phi_1'(g) = \omega'(u(g_{t+1}))$, and this term induces no persistence since only variables at date $t+1$ intervene. More generally, however, this term may alter the dynamic properties of g_t, as compared to the text's analysis, to the extent that both sectors benefit differentially from aggregate job creation, and that the aggregate employment probability of the employed may depend on g_t, which is not the case for the economy as a whole.[17]

Proof of proposition 3

Differentiating equation (23) we get:

$$\begin{aligned} 0 &= dg_t \left[F(\theta_g) - F(\theta_p)\right] + (1-u-g_t)f(\theta_p)\left[\frac{\partial\theta_p}{\partial g_t}dg_t + \frac{\partial\theta_p}{\partial g_{t+1}}dg_{t+1}\right] \\ &\quad + g_t f(\theta_g)\left[\frac{\partial\theta_g}{\partial g_t}dg_t + \frac{\partial\theta_g}{\partial g_{t+1}}dg_{t+1}\right] + uf(\theta_u)\left[\frac{\partial\theta_u}{\partial g_t}dg_t + \frac{\partial\theta_u}{\partial g_{t+1}}dg_{t+1}\right] \end{aligned}$$

Note then that:

$$\begin{aligned} \frac{\partial\theta_g}{\partial g_t} &= -\phi_{23}''(g) \\ \frac{\partial\theta_g}{\partial g_{t+1}} &= -\phi_{22}''(g) + b \geq 0 \\ \frac{\partial\theta_p}{\partial g_t} &= -\phi_{23}''(p) \\ \frac{\partial\theta_p}{\partial g_{t+1}} &= -\phi_{22}''(p) + b \geq 0 \\ \frac{\partial\theta_u}{\partial g_t} &= \frac{\phi_2'(g) + \phi_2'(p) + g_t\phi_{23}''(g) + (1-u-g_t)\phi_{23}''(p)}{u} \\ \frac{\partial\theta_u}{\partial g_{t+1}} &= b + g_t\phi_{22}''(g) + (1-u-g_t)\phi_{22}''(p) \geq 0 \end{aligned}$$

The inequalities come from the second order conditions for the preferred value of g_{t+1} for each decisive voter. If $\phi_{23}'' = 0$, then dg_{t+1}/dg_t will be positive iff the sum of the terms in dg_t is negative, or equivalently:

$$F(\theta_g) - F(\theta_p) + f(\theta_u)(\phi_2'(g) + \phi_2'(p)) < 0$$

[17] That is, even though one may have $\phi_1'(g) = \phi_1'(p)$, this common value may depend on g_{t-1}.

The proof is completed by noting that $\phi_2'(g) + \phi_2'(p) = \theta_p - \theta_u$. Q.E.D.

Proof of proposition 4

By proposition 3, positive persistence will occur iff:

$$f(bg_{t+1}+1+a(2g_t-(1-u))) < \frac{F(bg_{t+1}+1+au) - F(bg_{t+1}+1-au)}{2au} \quad (22)$$

Let $H(g_t) = (1-u-g_t)F(\hat{\theta}) + g_t F(\hat{\theta}-2au) + uF(\hat{\theta}+a(2g_t-1))$

Then: $H'(g_t) = F(\hat{\theta}-2au) - F(\hat{\theta}) + 2auf(\hat{\theta}+a(2g_t-1)) = 2au(f(\tilde{\theta}) - f(\hat{\theta}+a(2g_t-1)))$, with $\tilde{\theta} \in \left[\hat{\theta}-2au, \hat{\theta}\right]$. Because f is increasing for $\theta < \hat{\theta}$, one has $H'(g) < 0$ for $g < 0.5 - u$.

Let $\underline{g} = Max\{g, H(g) \geq 0.5, g < 0.5-u\}$. Then for all $g_t \leq \underline{g}$ one has $H(g) > 0.5$, since H is decreasing over this range, and $bg_{t+1} + 1 + au < \hat{\theta}$, since g_{t+1} is defined by (23), or equivalently:

$$\begin{aligned} 0.5 &= F(bg_{t+1}+1-au)\, g_t + F(bg_{t+1}+1+au)(1-u-g_t) \\ &\quad + F(bg_{t+1}+1+a(2g_t-(1-u)))\, u \end{aligned}$$

The RHS is increasing in g_{t+1} and equal to $H(g_t) > 0.5$ at $bg_{t+1}+1+au = \hat{\theta}$.

Since, the RHS of (22) can be written as $f(\check{\theta})$, with $\check{\theta} \in [bg_{t+1}+1-au, bg_{t+1}+1+au]$. Now, one has $bg_{t+1}+1+a(2g_t-(1-u)) < \check{\theta} < \hat{\theta}$ since $bg_{t+1}+1+au < \hat{\theta}$ and $g_t < 0.5 - u$.

Since f is increasing for $\theta < \hat{\theta}$, (22) holds. This completes the first part of proposition 4. The second part can be established symmetrically, in the zone where $g_t > 0.5$.

The third part can be shown by continuity. At $g_t = 0.5 - u$, $\check{\theta} > bg_{t+1} + 1 + a(2g_t - (1-u))$. At $g_t = 0.5$, $\check{\theta} < bg_{t+1} + 1 + a(2g_t - (1-u))$. Therefore, there exists $g \in [0.5-u, 0.5]$ such that $\check{\theta} = bg_{t+1} + 1 + a(2g_t - (1-u))$. At this point the RHS of (22) equals its LHS, so that $dg_{t+1}/dg_t = 0$.

Q.E.D.

Proof of proposition 5

Let us consider two alternative values of g_{t+1}, g^A and g^B, with $g^A > g^B$. The utility function of public employees is:

$$V_g(\theta, g_{t+1}) = \theta g_{t+1} - b g_{t+1}^2/2 - g_{t+1} + 1 - u + au(\frac{g_{t+1}}{g_t} - \frac{c}{2}\frac{g_{t+1}^2}{g_t^2})$$

This implies that they will prefer g^A to g^B iff $V_g(\theta, g^A) > V_g(\theta, g^B)$, or equivalently:

$$g^m = \frac{g^A + g^B}{2} < \frac{\theta - 1 + au/g_t}{b + cau/g_t^2}$$

The fraction of public sector employees who prefer g^B is therefore:

$$F(A_g g^m + B_g) = F(\theta_g(g_m)),$$

with A_g and B_g defined in the text.

Similarly, the utility of a private sector employee is:

$$V_p(\theta, g_{t+1}) = \theta g_{t+1} - b g_{t+1}^2/2 - g_{t+1} + 1 - u + au(\frac{1 - u - g_{t+1}}{1 - u - g_t} - \frac{c}{2}\frac{(1 - u - g_{t+1})^2}{(1 - u - g_t)^2}),$$

implying that they will prefer g^A to g^B iff:

$$g^m = \frac{g^A + g^B}{2} < \frac{\theta - 1 - \frac{au}{1-u-g_t} + \frac{cau(1-u)}{(1-u-g_t)^2}}{b + cau/(1 - u - g_t)^2}$$

The fraction of private employees who prefer g^B is thus:

$$F(A_p g^m + B_p) = F(\theta_p(g_m)).$$

Concerning the unemployed, their utility is:

$$V_u(\theta, g_{t+1}) = \theta g_{t+1} - b g_{t+1}^2/2 - g_{t+1} + (1-u)(1-a) + \frac{ca}{2}\left(\frac{g_{t+1}^2}{g_t} + \frac{(1 - u - g_{t+1})^2}{1 - u - g_t}\right)$$

It is clearly convex if and only if the sum of the square coefficients is positive, i.e.:

$$b < \frac{ca}{g_t} + \frac{ca}{1 - u - g_t}$$

Which establishes the first part of proposition 5.

The unemployed will favor g^A over g^B if and only if :

$$g^m > \frac{1 - \theta + ca(1-u)/(1-u-g_t)}{ca/g_t + ca/(1-u-g_t) - b},$$

implying that the fraction of unemployed workers who favor g^B is:

$$F(-A_u g^m + B_u) = F\left(\theta_u(g_m)\right)$$

Let now $S(g^m) = g_t F(\theta_g) + (1-u-g_t)F(\theta_p) + uF(\theta_u)$ the total fraction of people who prefer g^B. If g^A is a political equilibrium, then one must have $S\left(g^m\right) \leq 0.5$ for any $g^B < g^A$. Similarly, one must have $S(g^m) \geq 0.5$ for any $g^B > g^A$ (Since $S(g^m)$ is total support for the lowest value of g_{t+1}, which is g_A in this zone).

Therefore, two necessary conditions for g^A to be an equilibrium are $S(g^A) = 0.5$ and $S'(g^A) \geq 0$. This proves the third and fourth part of proposition 5.

To prove the second part of proposition 5, just note that in the case of a uniform distribution $F(\theta) = \left(\theta - \bar{\theta} + \sigma\right)/2\sigma$, total support is equal to:

$$S(g^m) = \frac{\sigma - \bar{\theta}}{2\sigma} + \frac{g_t(A_g g^m + B_g) + (1-u-g_t)(A_p g^m + B_p) + u(-A_u g^m + B_u)}{2\sigma}$$

Note that $A_g g_t + (1-u-g_t)A_p - uA_u = b > 0$ and that $B_g g_t + (1-u-g_t)B_p + uB_u = 1$. Therefore, $S(.)$ is increasing everywhere and equal to 0.5 at $g = (\bar{\theta} - 1)/b = g_I$, which completes the proof of (ii).

Q.E.D.

Threshold (%)	$\hat{u}(-1)$	t-statistic	Obs.
0	0		490
0.5	-0.88	(-6.6)	280
0.7	-1.26	(-7.9)	179
0.9	-1.32	(-7.2)	133
1.0	-1.41	(-6.9)	98
1.2	-1.55	(-4.7)	50
1.4	-1.86	(-5.0)	27

Table 1: Average unemployment (deviation from country average) for episodes where government consumption changes more, in absolute value, than some threshold.

Variable	(1)	(2)	(3)
$u(-1)$	-0.096	-0.1	-0.096
	(-2.1)	(-2.4)	(-2.7)
$\pi(-1)$	2.66		
	(1.1)		
$s(-1)$	-7.18	-7.6	-5.0
	(-1.9)	(-2.1)	(-1.5)
$d(-1)$	-0.27	-0.42	
	(-0.4)	(-0.7)	
Log Likelihood	-181.93	-185.6	-232.37
Obs.	353	356	441

Table 2: Probit estimation of the likelihood of a political change between $t-1$ and t. u : unemployment rate. π =GDP deflator inflation rate. s = government budget surplus (net lending) divided by trend GDP. d = gross government debt, divided by trend GDP. Trend GDP was computed using a Hodrick-Prescott filter with $\lambda = 100$. Sources: *OECD Economic Outlook* database for macroeconomic variables. Alesina and Roubini (1997) for political variables.

Figure 1

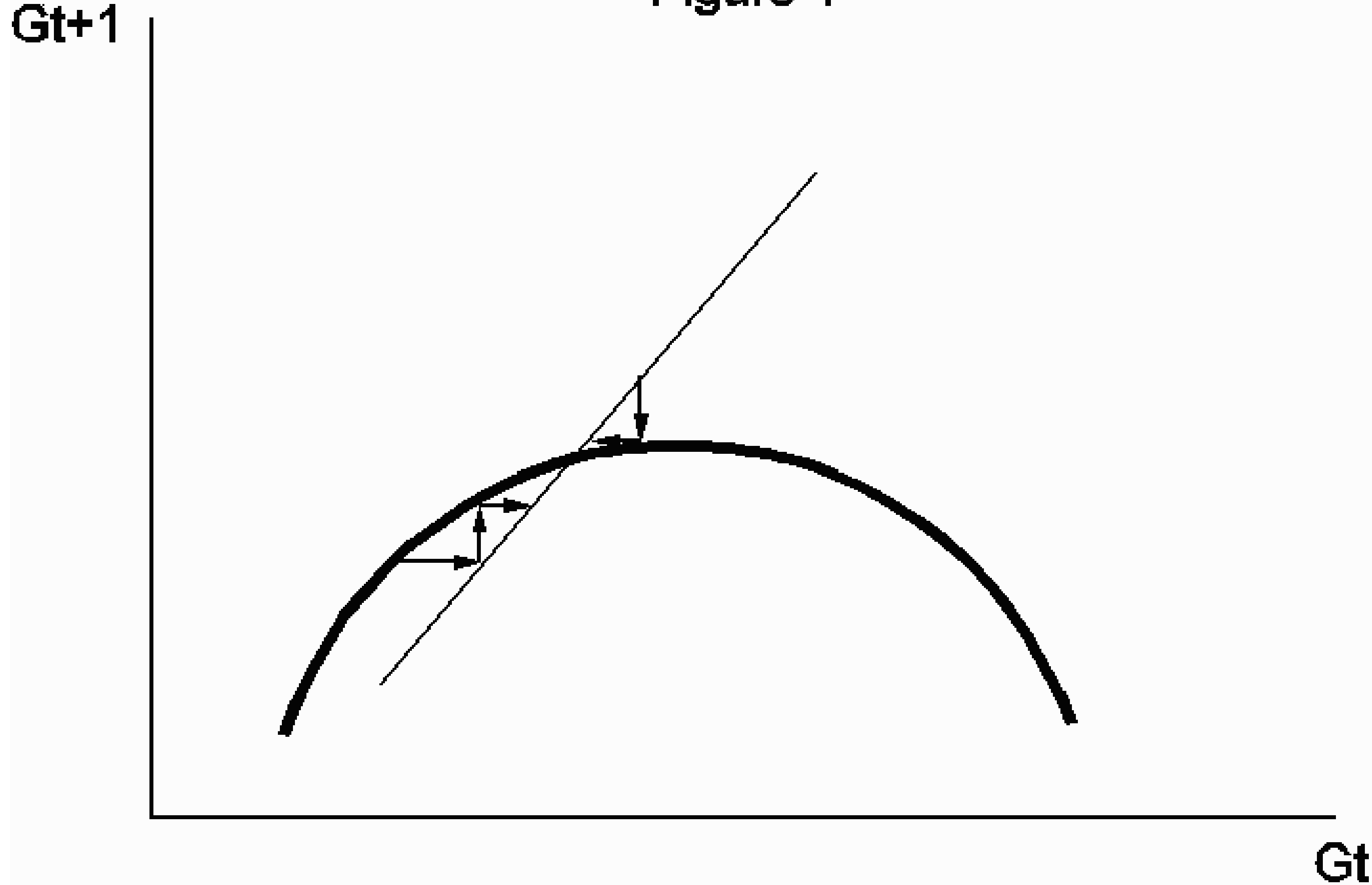

Figure 2