Do Re-election Probabilities Influence Public Investment?*

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Abstract

We identify exogenous variation in incumbent policymakers' re-election probability and explore empirically how this variation influences the incumbents' investment in physical capital. Our results indicate that a higher re-election probability leads to higher investments, particularly in the purposes preferred more strongly by the incumbents. This result aligns with a theoretical framework where political parties disagree about which public goods to produce using labor and predetermined public capital. Key for the consistency between data and theory is to account for complementarity between capital and flow variables in government production.

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1 Introduction

This paper explores whether and how strategic considerations influence the accumulation of physical capital in the public sector. The analysis is motivated by the fact that the stock and composition of physical capital at any point in time is determined by decisions made in the past. Hence, when deciding how much and in which projects to invest in the current period, an incumbent policymaker should consider how these decisions will influence policy in the future. In particular, incumbents may consider their perceived re-election probability when they make investment decisions. We therefore test if variation in incumbents' re-election probability affects the overall amount and composition of their investments in physical capital.

Investigating public capital accumulation is interesting because it can provide insight into what motivates policymakers' decisions. In cornerstone studies Persson and Svensson (1989) and Tabellini and Alesina (1990) (TA, hereafter) show that how much a government chooses to save in financial capital will be affected by its probability of remaining in office in the future.[1] These outcomes are generally referred to as strategic debt accumulation, and are theoretically well understood as potential determinants of actual policies.[2] However, when confronted with data, these theories have not found much support.[3] This may be taken as evidence that the strategic considerations emphasized in the political economics literature are not relevant for understanding public savings. However, these studies ignore that financial capital is not the only instrument for storing public wealth.

[1] Persson and Svensson (1989) show that the risk of being replaced motivates politicians who favor a relatively small public sector to run excessively high deficits, while it motivates politicians that favor a relatively large public sector to run excessively high surpluses. TA argue that when voters disagree over the composition of government spending, any policymaker who expects to be replaced by someone with different preferences has an incentive for excess debt accumulation.

[2] These theories are often given considerable attention both in general macroeconomic textbooks, such as Romer (2001), and in specialized textbooks on political economics, such as Persson and Tabellini (2000).

[3] Using a time series of US quarterly data and a panel of 16 OECD countries, Lambertini (2004) rejects that re-election probabilities influence public deficits. A similar conclusion, based on a slightly different panel of OECD countries is reached by Franzese Jr. (2001). The only study finding traces of strategic debt accumulation is that by Petterson-Lidbom (2001) on Swedish municipalities. He finds that right-wing governments tend to increase debt when they expect to be replaced by their left wing opposition in the future. Left-wing incumbents do the opposite.

An alternative is physical capital, and as emphasized in Natvik (2009) the availability of this policy instrument may dampen and even remove the incentive for strategic debt accumulation, as physical capital is used to influence future policy instead. We therefore empirically assess the key predictions in Natvik (2009) regarding how re-election probabilities influence the *total level* and *composition* of investment in public capital. We contrast this with the response of current expenditure.

In our analysis we use a panel data set of Norwegian municipalities observed over a period of 28 years, where elections are held simultaneously every fourth year. Two features make our data especially well-suited for investigating politicians' investment decisions. First, all Norwegian local governments operate within the same institutional environment, facilitating comparison in the cross-section and over time. Second, these local governments are free to accumulate as much physical capital as they like and to deficit finance it if necessary. The Norwegian local governments have large discretion in investment policy, in comparison to other OECD countries (Rattsø, 2003).

Finally we utilize a unique feature of the Norwegian institutional setting to obtain exogenous variation in re-election probabilities: National elections are held exactly in the middle of the local election term, and contain information about local incumbents' popularity.[4] These national elections provide information on the incumbents' popularity in each municipality separately, and we are free to choose the level of aggregation at which we use this information. This allows us to address the reverse causality problem inherent in any approach to analyze how popularity influences policy: We instrument the result of the national election held in each municipality i by the result from the same election held in all other municipalities of the county to which i belongs. In this manor we capture regional swings in voters' ideological sentiment. Our identifying assumption

[4]The ability of the incumbent government to call an early election is a common feature of most political systems. Among the OECD countries, only Norway, Sweden, Switzerland and the United States have exogenous election terms at the national level. In other OECD countries early elections can be held if the incumbent government wishes to do so and the occurrence of an early election is quite prevalent (Heckelman and Berument, 1998). Norway is, as far as we know, the only OECD country that also has regularly scheduled elections at the local level that differs from the national election cycle (Sweden has exogenous local and national elections terms that coincide).

is that the county-wide result from the national election does not influence local policy except through its impact on perceived re-election probabilities. Rich data allow us to investigate the identifying assumption closely.

Our results indicate that public investments do respond to re-election probabilities. We find that incumbents raise total investment when the re-election probability increases. We also find qualitative differences between incumbents of different party affiliation, as left-wing incumbents increase investments in child-care only, while right-wing incumbents tend to raise investment in education and elderly care when the re-election probability goes up. In light of the existing evidence on party-preferences in Scandinavia (Sørensen (1995), Svaleryd (2009))), our analysis indicates that when re-election becomes more likely, incumbents increase investment in the purposes they prefer more strongly than their competitors for office.

Importantly, these findings allow us to distinguish between existing theories on public sector capital accumulation. Frameworks where public capital is equivalent to a durable version of a public good, as in Glazer (1989) and Beetsma and van der Ploeg (2007), predict that incumbents will increase total investment and tilt the composition of investment toward their most preferred purposes if re-election becomes less likely. Our findings are the opposite. A framework where capital is an input that must be combined with flow variables (i.e. labor) in order to produce public goods, as in Natvik (2009), yields predictions that are consistent with both the level and composition effects we find in the data. When capital is complementary to flow variables in government production, the expectation of losing influence in the future makes an incumbent hold back on investment since the capital he purchases will be inefficiently combined with complementary inputs in the future.

The rest of this paper is organized as follows. Section 2 lays out a theoretical framework based on Natvik (2009) to motivate the empirical analysis. Section 3 presents the data and the institutional setting. In section 4 we present our empirical strategy. Section 5 presents the main results. Section 6 explores the robustness of our results along various

dimensions and examines the validity of our identifying assumption. Section 7 discusses our findings in relation to the theory presented in Section 2. Section 8 concludes.

2 Theory

Based on the framework proposed in Natvik (2009), we here provide a theoretical argument why re-election probabilities can influence public investment. This model is an extension of that in TA and Alesina and Tabellini (1990), where political agents disagree over which goods and services government should provide. The extension is that these goods cannot simply be purchased at fixed prices, but must be produced using labor and publicly owned capital.

2.1 The Model

There are two periods, $t = \{1, 2\}$, and two parties, $J = \{R, L\}$. Each period a party J is in office and decides how to spend one unit of income in order to produce two goods f and g with the production functions

$$h_t = h(n_t^h, k_t^h) = \left(\gamma {n_t^h}^{\frac{\varepsilon-1}{\varepsilon}} + (1-\gamma)\, {k_t^h}^{\frac{\varepsilon-1}{\varepsilon}}\right)^{\frac{\varepsilon}{\varepsilon-1}}, \tag{1}$$

where n_t^h and k_t^h are labor and capital used in period t to produce good h, $h = g, f$. The supplies of capital and labor to the public sector are infinitely elastic at the unit cost 1. While the amount of labor employed is freely chosen each period, capital is chosen one period in advance and specific to the production of each public good. Hence k_2^h is set in period 1.

In the first period the public sector's budget constraint is

$$n_1^g + n_1^f + k_2^g + k_2^f = (1-\delta)\left(k_1^g + k_1^f\right) + 1 + b, \tag{2}$$

where δ is the depreciation rate of public capital and b is debt accumulated in that period.

In period 2, no investments are undertaken and the budget constraint is

$$n_2^g + n_2^f = 1 - b. \tag{3}$$

The gross interest rate on bonds is exogenous and equal to 1, which also is the inverse of politicians' discount factor.[5] Obviously, (3) builds on the assumption that debt is always honored, and implies that $b \in [-1, 1]$. This budget constraint also implies that public capital is irreversible for the period 2 decision-maker as he cannot liquidate it.

In period 1 the empowered party chooses $\left\{n_1^g, n_1^f, k_2^g, k_2^f, b\right\}$. The party in office in period 2 sets $\left\{n_2^g, n_2^f\right\}$. Party J's preferences are given by $W^J = E\sum_{t=1}^{2} u\left(g_t, f_t|\alpha^J\right)$, where

$$u\left(g_t, f_t|\alpha^J\right) = \frac{\left[\left(\alpha^i g_t^{\frac{\phi-1}{\phi}} + (1-\alpha^i) f_t^{\frac{\phi-1}{\phi}}\right)^{\frac{\phi}{\phi-1}}\right]^{1-1/\sigma}}{1-1/\sigma}. \tag{4}$$

Here ϕ is the intratemporal elasticity of substitution between goods g and f, while σ is the intertemporal elasticity of substitution for efficiency units of public goods.[6] $E(\cdot)$ is the expectations operator, reflecting that there is uncertainty about who is in charge next period. Before period 2 an election is held over which party is to be in office in that period. With probability p_R party R wins, with probability $1 - p_R$ party L wins.

2.2 Political Equilibrium

The equilibrium objects of this economy are $\left\{n_1^g, n_1^f, k_2^g, k_2^f, b\right\}$ and $\left\{n_2^g, n_2^f\right\}$. Since first period choices are contingent on second period reactions, the model is solved by backward induction.

[5] We can think of the interest rate on b as determined on the world market.

[6] An efficiency unit of public goods is $\left(\alpha^i g_t^{\frac{\phi-1}{\phi}} + (1-\alpha^i) f_t^{\frac{\phi-1}{\phi}}\right)^{\frac{\phi}{\phi-1}}$.

2.2.1 The Second Period

In period 2 the office holder, identified by α_2^J, allocates labor to production of each good. This party's problem is

$$\max_{n_2^g, n_2^f} u\left(g_t, f_t | \alpha_2^J\right)$$

subject to (1), and (3). Ignoring the specific functional forms in (4) and (1) to preserve space, we may write the first-order condition as

$$u_g\left(g_2, f_2 | \alpha_2^J\right) g_n\left(n_2^g, k_2^g\right) = u_f\left(g_2, f_2 | \alpha_2^J\right) f_n(n_2^f, k_2^f) \tag{5}$$

Together with the budget constraint (3), this equation implicitly defines the equilibrium choices n_2^{g*} and n_2^{f*} as functions of α_2^J, b, k_2^g and k_2^f. Define these functions as

$$n_2^{g*} = G\left(\alpha_2^J, b, k_2^g, k_2^f\right) \tag{6}$$

$$n_2^{f*} = F\left(\alpha_2^J, b, k_2^g, k_2^f\right). \tag{7}$$

Under mild restrictions, discussed in Natvik (2009), these reaction functions have the intuitive properties $G_{\alpha_2^J} = -F_{\alpha_2^J} > 0$ and $G_b = -1 - F_b \ \epsilon \ \langle 0, 1 \rangle$. However, the labor response to capital is ambiguous. With the specific functions in (1) and (4), second period labor choices depend on capital in the following way:

$$G_{k_2^g} = -F_{k_2^g} \gtreqless 0 \Leftrightarrow \varepsilon \gtreqless \phi \tag{8}$$

and equivalently for $F_{k_2^f} = -G_{k_2^f}$. The intuition here is that an extra unit of capital has two opposing effects on second period labor demand. On the one hand, an extra unit of k_2^g tends to increase the marginal productivity of labor in producing g_2, and more strongly so the higher is the complementarity (the lower is ε) between the two input factors in production. All else equal, this motivates the second period policymaker to increase employment in the g-sector. On the other hand, an extra unit of k_2^g will raise

the provision of g-goods relative to f-goods, all else equal. When the policymaker views the two goods as imperfect substitutes ($\phi < \infty$) this motivates a shift of labor from g-production to f-production. Hence, the use of labor in g-production increases with the amount of capital installed for that purpose if and only if the degree to which k_2^g substitutes for n_2^g in production (ε) is lower than the degree to which g_2 substitutes for f_2 in consumption (ϕ).

2.2.2 The First Period

The first-period policymaker, identified by α_1^J, solves the following problem:

$$\max_{n_1^g, n_1^f, k_2^g, k_2^f, b} E \sum_{t=1}^{2} u\left(g_t, f_t | \alpha_1^J\right)$$

subject to the production technology summarized by (1), the budget constraint (2) and the reaction functions (6) and (7). Thus, the office holder in period 1 internalizes how its investment choices will influence outcomes in period 2. The first-order conditions for the solution to this problem are given in the appendix.

2.2.3 Model Solution and Parametrization

Because the model does not have a general closed-form solution, we solve it numerically. Our procedure is to find the values of $\left\{n_1^g, n_1^f, n_2^g, n_2^f, k_2^g, k_2^f, b\right\}$ that satisfy the first-order conditions (5) and (13)-(16) (in the appendix) and the budget constraints.[7] As a benchmark, we set the parameter values as displayed in Table 1.

The choice of $\varepsilon = 0.7$ is motivated by evidence from estimated macro production functions, such as Klump et al. (2007). γ is set to 0.7, implying a labor share of about 65 percent if the government were cost minimizing. [8] The depreciation rate per election

[7] In order to solve the model, initial capital stocks $\left\{k_1^g, k_1^f\right\}$ must be specified. We set $\left\{k_1^g, k_1^f\right\}$ so that if $p_R = 1$ it is optimal to choose $k_2^h = k_1^h$ for $h = g, f$. As shown in Natvik (2009), these initial conditions for capital do not influence how anticipated turnover affects policy.

[8] Based on Cavallo (2005) this seems reasonable for the labor share of government production in the US.

term, δ, is set to 0.2, which implies a yearly depreciation rate slightly below 5 percent, consistent with what Blanchard and Giavazzi (2004) and Kamps (2004) argue is empirically reasonable for public capital. We set σ equal to 1, which is a standard value for households' intertemporal elasticity of substitution for private consumption in the macroeconomic literature (King and Rebelo (1999)) and in line with recent estimates in finance (Vissing-Jørgensen and Attanasio (2003)). For the intratemporal elasticity of substitution we have no evidence to guide us, and we set ϕ to 0.5. For further discussion, see Natvik (2009).

Importantly, σ, ϕ and ε are the parameters that determine the model's qualitative predictions which we will explore empirically. We therefore explain the role of these parameters below.

2.3 Key Implications

The key questions that we wish to explore empirically regard the following: How does the probability that an incumbent is re-elected affect its choices of current expenditure and investment?

We display the model's answers to these questions in Figure 1. The figures are plotted for an incumbent of type R. Since we study the case where party R is in office in period 1, the probability of re-election is p_R. Recall that in this numerical example $\alpha^R = 0.6$, which implies that the incumbent party prefers goods of type g more strongly than its competitor. The plots display the respective variables' percentage point deviation from the value they take when $p_R = 0$.

The figure gives us the following main predictions for how the re-election probability affects first period policies:

2.3.1 Investment

1. When the probability of re-election increases, an incumbent party increases investment in its most preferred purposes relative to its less preferred purposes. (I^g/I^f

increases with p_R, where $I^h \equiv k_2^h - (1-\delta)\, k_1^h$)

Intuition: An incumbent party that expects to lose the coming election will invest so as to influence how its successor allocates labor expenditure. Specifically, the incumbent will wish to motivate its successor to hire most labor in production of the good that the incumbent prefers relatively strongly (g in the example). From expression (8) we know that when $\phi < \varepsilon$, it follows that $dn_2^f/dk_2^f = -dn_2^g/dk_2^f < 0$ and $dn_2^f/dk_2^g = -dn_2^g/dk_2^g > 0$. Hence, when $\phi < \varepsilon$, as in the upper left plot in Figure 1, the incumbent party will tilt the investment composition *away from* its own most-preferred purpose as re-election becomes *less* likely, and *towards* it own most-preferred purpose as re-election becomes *more* likely. By the same logic, if $\phi > \varepsilon$ the investment composition becomes more tilted toward good f as p_R increases, as we see in the upper left plot of Figure 1. Hence, the prediction that I^g increases relative to I^f when p_R rises, holds only when $\phi < \varepsilon$.

2. When the probability of re-election increases, an incumbent increases total investments.

   Intuition: The incumbent party (R in the example) understands that if it is ousted from office, less labor will be employed to produce the good it prefers relatively strongly (good g in the example). Thus, when capital and labor complement each other, the returns to investment in the incumbent's most preferred purpose are lowered by political turnover. The effect on capital returns in the other purpose (f in the example) will of course go in the opposite direction, but since the incumbent derives relatively low utility from this good, that effect will not outweigh the first. Hence, the more likely an incumbent is to remain in office, the higher it will value future public capital, and the more it will invest. We will later refer to this effect as the 'aversion to inefficient capital utilization'. The lower left plot of Figure 1 illustrates that the essential assumption for this prediction is sufficient complementarity between capital and labor, i.e. that ε is small.

As consequence of predictions 1 and 2, it follows that:

(a) When the probability of re-election increases, the incumbent invests more in the project he prefers more strongly than his successor.

Note, however, that what happens to investment in the incumbent's least preferred purpose is less clear. In the numerical examples displayed in the upper panels of Figure 1 I^f increases with p_R, but this is highly sensitive to the value assigned to the parameter σ. With a lower value of σ, I^f may be unaffected by or decreasing in p_R, while a higher value of σ implies a more upward sloping relationship between I^f and p_R.

2.3.2 Wage Expenditure ("Current Expenditure")

1. The composition of wage expenditure across the two purposes is unaffected by the probability of re-election.

   Intuition: The employment composition (n_1^g/n_1^f) is determined by the initial capital stocks, as is evident from the first-order condition (13) in the appendix. Because these are beyond an incumbent's control, and because wages are exogenous, it follows that the wage spending is not influenced by re-election probabilities.

As shown in the lower right panel of Figure 1, an incumbent may also adjust the total level of wage spending to variation in the re-election probability. Wage expenditure increases with the re-election probability when $\sigma > 1$, decreases when $\sigma < 1$, and is unaffected when $\sigma = 1$.[9] However, because the Norwegian municipalities we explore

[9]On the one hand, turnover implies a "substitution effect": The incumbent will wish to shift labor expenditure from the second period to the first period, as this allows it to spend more on the purpose it prefers more strongly. On the other hand turnover implies an "income effect": Politicians want to smooth the instantaneous utility flow from publicly provided goods over time. Because turnover implies that in period 2 relatively little labor is allocated to the purpose that the incumbent derives most utility from, the way to smooth the utility flow is to cut labor expenditure in period 1 in favor of period 2. This income effect dominates the substitution effect if $\sigma < 1$, while the substitution effect dominates if $\sigma > 1$. If $\sigma = 1$, the two effects cancel out.

must balance current expenditure against income, as explained below, we do not believe that this dimension of the model is testable with our data.

In this theoretical model the key difference between capital and labor is that the latter is freely determined each period, while the former is not. Empirically we distinguish between capital and current expenditures. Current expenditures are dominated by wage expenditures. We believe that although these inputs are not completely flexible each period, they are considerably more flexible than physical capital.

3 The Institutional Setting and Data

The Norwegian political system consists of three layers of government: central government, counties and local governments. The local public sector is a substantial part of the Norwegian economy. Spending undertaken by local governments constitutes $15-20$ percent of (mainland) GDP, and around 25 percent of the work force is employed in the local public sector. The entities we will study in our analysis, are the Norwegian local governments.

The three main welfare services provided by Norwegian local governments are: child care, primary education and care for the elderly. In addition they have the responsibility for some other services, such as culture and infrastructure. The local governments face some regulations concerning coverage and standards of welfare services, but have considerable discretion concerning the composition of expenditures. On the revenue side they are more restricted. The local public sector is largely financed by bloc grants and regulated income taxation. In addition local governments have some discretion with respect to user fees and property taxation (Fiva and Rattsø (2007)). Rattsø (2003) offers an excellent description of this system characterized by vertical fiscal imbalance.

An important feature of the Norwegian system is that local governments are free to deficit finance investment, as long as current spending inclusive interest payments do not exceed revenues. The punishment for violating this requirement is to be set under

administration by the central government, but this happens extremely rarely. Budgets and borrowing must however be approved by the regional commissioner (*fylkesmannen*), the central government's representative in the county. If the balanced budget requirement is broken, the regional commissioner will act to restore economic balance (Borge (2005)).

3.1 Data from Local Government Accounts

In this analysis we utilize rich data from the local governments' accounts that allow us to distinguish between current expenditures and investment for different purposes. Our data set covers 7 electoral periods, from 1972 to 1999. We do not use data after 1999 because of a reform in the organization of the account data in the following election term. In the period we study, the number of local governments fluctuated between 434 and 454.

We focus on the main welfare services that local governments are responsible for: education, elderly care and child care.[10] On average, spending on these three purposes together constitute about 45 percent of total municipal spending. Local governments are the main providers of these services. The public sector faces little competition from the private sector, in particular for educational services. Almost all pupils are enrolled in public primary schools.

Investment is defined as maintenance and spending on new buildings and structures (including wage expenditure etc. in relation to these) minus sales of buildings and structures. On average, maintenance accounts for about 50 percent and sales account for about 2.5 percent of total investment in our data. Current expenditure is the sum of wages, equipment, external transfers and 'other current expenditures'. Table 2 displays spending per capita for the different purposes based on two-year averages. The descriptive statistics are based on the final data set that we utilize in our empirical analysis.[11]

[10]In preliminary investigations we also analyzed the impact of changes in re-election probabilities on other sectors, namely central administration, culture and infrastructure. We did not find any impact of re-election probabilities on these expenditure types. This aligns with the theory in section 2, since only spending on the purposes that parties disagree about should be influenced by re-election probabilities.

[11]We exclude local governments involved in mergers, secessions or borderchanges during an electoral period, local governments that do not have proportional election systems and the capital, Oslo, which has a different institutional structure than other local governments. We also exclude local governments

[Table 2 about here]

In our sample, the average local governments spend about NOK 11500 (approx. USD 2000) per capita on the production of education services, elderly care and child care each year. Current expenditures account for about 90 percent. The coefficients of variation for investments on education, elderly care and child care are 1.25, 2.29 and 2.28, which reflect that investments in welfare services are lumpy. The corresponding coefficients of variation for current expenditures are 0.25, 0.80 and 0.99.

3.2 Political System

Each local government is ruled by a locally elected council, based on proportional representation. Representatives represent political parties or local lists formed outside the party structure. Local lists are quite widespread in small municipalities, but rarely have a significant share of seats in larger municipalities. Most representatives represent one of the 7 major parties that are dominant at both the local and the national arena.

The mayor is the key player in the local council. The mayor is elected by the local council at the beginning of each election term. Under the New Local Government Act, implemented in 1992, the mayor cannot be removed within an election term. Before 1992 some local governments had a practice where the mayor and the deputy mayor changed positions after two years (Gravdahl (1998)).

The Norwegian policy space is well represented by a single left-right dimension (Strøm and Leipart (1993)). The main political divide goes between the socialist and the non-socialist camp and the political system is dominated by these two blocs. The left bloc is strongly dominated by the Labor Party, while the right bloc is more fragmented.[12] The same parties are dominant at both the national and the local level. At the local level

with less than 1000 inhabitants and local governments that have one or more representative from local lists. We also lose a limited amount of observations due to missing data from the local government accounts.

[12]We classify representatives that belong to the Socialist Left Party, the Labor Party, Red Electoral Alliance and the Communist Party as belonging to the left-wing bloc.

parties sometimes form joint lists, which are always from the same bloc in our data. In the average local council, 41 percent represent one of the parties in the left bloc, or joint lists of left bloc parties, 52 percent represent right bloc parties, or joint lists of right bloc parties, and 7 percent represent local lists that cannot immediately be categorized as belonging to the left or right bloc.

We exclude local governments with one or more representatives from local lists. We also exclude local governments before 1992 where the mayor and deputy mayor are from different blocs.[13]

County and local government elections are held in September every fourth year. National elections are also held every fourth year in September, but the electoral cycle differs from the local elections with two years, i.e. national elections are held exactly in the middle of two local elections. We will use this institutional feature in our empirical strategy.

The system of representation into the national parliament largely mirrors the system at the local level. Although local lists are sometimes formed at the national election, their electoral support is in most cases negligible. Between 1973 and 1997 only two representatives got elected from local lists. We exclude local governments from these counties in the relevant election periods.

Table 3 provides descriptive statistics on political variables in our final sample. These are dummies for the mayors' bloc (MayorLeft and MayorRight), share of representatives from each bloc (ShareLeft and ShareRight), support for the incumbent mayor at the local (SupportLocalElection) and national elections (SupportNationalElection), a dummy capturing whether the bloc of the incumbent is in power also the next election period (ReElect), and finally the change in support for the bloc of the incumbent from the local election to the national election, measured both at the local ($\Delta Support$) and county-wide levels ($\Delta Support^{County}$). $\Delta Support^{County}$ is key in our empirical strategy, and we

[13]The total number of available observations is 2933. 1093 observations are excluded because the local council has at least one representative from local lists, another 156 because the mayor and deputy mayor are from different blocs.

elaborate on this in Section 4.

[Table 3 about here]

In order for us to investigate the theory laid out in Section 2, it would be instructive to know whether politicians belonging to the left and right blocs politicians have divergent preferences over the composition of welfare services. However, to distinguish between party politics, inhabitants' preferences and other local characteristics is not straightforward. This is clearly pointed out by Lee et al. (2004), Ferreira and Gyourko (2007) and Petterson-Lidbom (2008), who rely on regression discontinuity (RD) designs to distinguish between them. While Petterson-Lidbom (2008) finds that parties care about the size of government in Swedish municipalities, Ferreira and Gyourko (2007) find no evidence of such partisan politics in U.S. cities (although traditional OLS estimates point strongly in that direction). However, a potential problem with RD design arises if parties are adjusting their policies to compete for swing voters. If this is the case and both political groups try to attract the same voters, their implemented policies may converge even though their preferences differ. It is exactly close to the discontinuity of 50 percent support by voters that this competition will be at its fiercest.

An alternative approach to reveal politicians' preferences would be to ask them how they would like to spend marginal revenues if they could choose freely. Sørensen (1995) does this for the Norwegian municipalities that we study, asking representatives in municipality councils in the election period from 1987 to 1991. His findings are that left-wing representatives want to increase the supply of child care services and cut back on education relative to what right-wing representatives want. Right-wing representatives, want to expand both education and elderly care at the expense of child care. Svaleryd (2009) documents a similar pattern based on survey data of elected representatives in Swedish local councils from 1980 and 1993. In contrast to right-wing politicians, left-wing politicians rank child care as the most important spending category. Since disagreement is most pronounced for child care and education, we would expect the strongest effects of

re-election probabilities on these expenditure components.

4 Empirical Strategy

To pin down how re-election probabilities affect policy-making we face three econometric challenges. First, we are interested in estimating the impact of a variable, the (perceived) re-election probability, which is inherently unobservable. Second, this variable may be correlated with other local government characteristics that influence political outcomes (omitted variable problem). And third, the (perceived) re-election probability may be a result, and not a cause, of political decisions (reverse causality problem).

Our empirical strategy is based on the following conjecture: The share of votes an incumbent bloc received when it was elected into office through the local election in year t contains information about how likely that bloc is to be re-elected through the local election at time $t+4$. Similarly, the share of votes an incumbent bloc receives in the national election in year $t+2$ also contains information about how likely re-election is. Denote these two vote shares as $S_{i,t}$ and $S_{i,t+2}$, respectively. If our conjecture is correct, then a change in support within election period T, $\Delta S_{i,T} \equiv S_{i,t+2} - S_{i,t}$, indicates that an incumbents' probability of being re-elected has changed. Hence, we consider the results from the national election as a "grand opinion poll" that captures ideological preferences of the electorate, while leaving the composition of the local council unaffected. The national election is a particularly useful tool as it contains information from each municipality separately and we can choose the level of aggregation at which we use this information. The empirical relevance of this idea is evaluated in the next section.

With the above logic in mind, we wish to estimate the following relationship:

$$\Delta Y_{i,T}^{j} = \psi \Delta S_{i,T} + \tau_T + \varepsilon_{i,T}, \tag{9}$$

where Δ is the first-difference operator, and $\Delta Y_{i,T}^{j}$ is the change in spending on purpose j from the two first years in election period T to the two last years in that election period.

We include election period fixed effects, τ_T, in order to allow for election cycles unrelated to changes in re-election probabilities. These take out national swings in partisan sentiment and other time effects.[14] The key parameter of our interest is ψ.

Note that with the specification in (9) our inference is based on changes in policymaking within election periods, and hence for given policymakers. One strength of this approach is that all time-invariant factors are netted out. Unobserved characteristics of the incumbents will not influence our results. However, an OLS regression run directly on Equation (9) is likely to suffer from an endogeneity problem: Parliamentary election results may depend on preceding local political decisions, i.e. $Cov\left(\Delta S_{i,T}, \varepsilon_{i,T}\right) \neq 0$. For instance, if a mayor is perceived sa having done a good job during his first two years in office, voters may be more inclined to support his bloc at the national election. This generates an endogeneity problem if spending is correlated with voters' perception of incumbents' performance. More generally, omitted variables that influence both local priorities and voting will bias direct OLS estimation of (9).

To address the endogeneity problem we use an instrumental variable approach. Our instrument is the population-weighted average of the support for the incumbent's bloc in all other municipalities in the county to which municipality i belongs. This county-level information, denoted $S_{i,T}^{county}$, is calculated as follows:

$$\Delta S_{i,T}^{county} = \frac{\sum_{j \neq i}^{C_i} pop_{j,t} \Delta S_{i,T}^{county}}{\sum_{j \neq i}^{C_i} pop_{j,t}},$$

where C^i denotes the number of other municipalities in the county to which municipality i belongs and $pop_{j,t}$ is the population size of municipality j in year t.

Our first stage equation is given by

$$\Delta S_{i,T} = \zeta \Delta S_{i,T}^{county} + \tau_T + \epsilon_{i,T}, \tag{10}$$

[14] Several studies have documented an election cycle in public policy, e.g. Drazen and Eslava (2005), Veiga and Veiga (2006) and Dahlberg and Mörk (2008), using data from Columbian, Portuguese and Swedish local governments respectively.

The idea behind this equation is that the change in support from the local election result at the county level ($S_{i,t}^{county}$) to the national election result at the county level ($S_{i,t+2}^{county}$) two years later captures regional swings in partisan sentiment, which can be treated as independent of local decisions. Our identifying assumption is that change in support for the incumbent's bloc at the county level does not influence the change in local decision making, except through its impact on perceived local re-election probabilities. In sensitivity analyses this assumption will be closely investigated.

We will estimate all equations separately for mayors from each of the two blocs. Hence, changes in the composition of parliament cannot be driving any results, as long as all incumbents from the same bloc are similarly effected.

5 Results

5.1 The National Election and Re-election Probabilities

The central element in our empirical strategy is that we consider the regional results of the national election for parliament as signals to local incumbents about their likelihood of being re-elected. A key question is then: Does the national election provide relevant information about the local incumbents' re-election probability? To answer this question, we run the following probit regressions that relate actual local election outcomes in $t+4$, denoted by $R_{i,t+4}$, to the incumbent blocs' support at the elections in t and $t+2$:

$$R_{i,t+4} = \nu_1 + \omega_1 S_{i,t} + \eta_{1,i} \tag{11}$$

and

$$R_{i,t+4} = \nu_2 + \omega_2 S_{i,t} + \theta S_{i,t+2} + \eta_{2,i}. \tag{12}$$

Here $R_{i,t+4} = 1$ if the incumbent bloc is re-elected, while $R_{i,t+4} = 0$ if the incumbent bloc is not re-elected. If θ in Eq. (12) is different from zero, then the parliamentary election brings new information to the incumbents about their support among the voters.

The results from regressions on (11) and (12) are provided in Table 4. The table shows that the estimates of ω_1 and θ are large and highly statistically significant, while ω_2 is not. Hence, while $S_{i,t}$ is a significant predictor of future re-election before $S_{i,t+2}$ is known, this is no longer the case once $S_{i,t+2}$ is included in the information set; the impact of $S_{i,t}$ is close to zero and statistically insignificant when we control for $S_{i,t+2}$. These results imply that a change in support from the local to the national election, $\Delta S_{i,t}$, indicates a change in incumbents' re-election probability.

[Table 4 about here.]

Predicted values from the probit specifications are shown graphically in Figures 2 and 3. As is evident, there is far from complete correspondence between predicted values at time t, and predicted values at time $t+2$.

[Figures 2 and 3 about here.]

5.2 The Effects of Changes in Re-election Probabilities

The results from the first stage regression, as specified in (10), are reported in Table (5). The excluded instrument, $\Delta S_{i,t}^{county}$, is a strong predictor of $\Delta S_{i,t}$. The F-statistics take values of 52 and 69 for the right and left blocs, respectively, indicating that the instrument is highly relevant. A one percentage point increase in the support for the bloc of the incumbent at the county level, translates into roughly 0.5 and 0.6 percentage points higher support for the right and left bloc incumbents at the local level, respectively.

[Table 5 about here.]

Our results for investment are presented in Table 6 and for current expenditure in Table 7. The results are obtained from separate regressions for each category of public expenditure (education, elderly care and child care), as well as the aggregates (i.e. the sum over the three categories). Each table presents results for right-bloc incumbents in

the upper panel (specification 1 to 4), and results for the left-bloc incumbents in the lower panel (specification 5 to 8). In order to facilitate interpretation, all spending variables are standardized by their standard deviation.

[Tables 6 and 7 about here.]

Table 6 shows that public investment varies with changes incumbents' support. For the right bloc, there is a positive aggregate effect that is statistically significant at the five percent level. This seems to be driven by investment responses in education and elderly care, although neither of these components' responses are significant at the five percent level when considered separately. Incumbents from the left bloc, on the other hand, tend to raise investment in child care when their re-election probability increases. This effect is statistically significant at the one percent level. Because these incumbents do not adjust spending on elderly care or education, which together dominate total spending, the aggregate investment is not significantly different from zero.

Quantitatively, the results show that a 5 percentage point increase in the support of a right bloc incumbent raises aggregate investment by 0.7 standard deviations. Similarly, a 5 percentage points increase in the support of an incumbent from the left bloc increases investment in child care by 0.8 standard deviations.

In the theoretical analyses of Glazer (1989) and Beetsma and van der Ploeg (2007), a prediction is that the less likely incumbents are to be re-elected, the more will they invest. Our finding that investments tend to increase with incumbents' support contradicts this prediction. On the other hand, this finding is more consistent with the theoretical predictions emphasized in Natvik (2009), and displayed in the lower left plot of Figure 1. The essential mechanism in this framework is that incumbents are averse to the inefficient capital utilization that will follow if they lose influence to someone with different preferences for public goods.

In light of the evidence in Sørensen (1995) on party-preferences, our results suggest that both left- and right-wing incumbents tend to tilt the composition of investment

toward their most preferred welfare service when their re-election probabilities increase. This tendency is strong for left bloc incumbents, who raise child care investments, while it is somewhat weaker for incumbents from the right bloc who more strongly prefer education and elderly care. Cast against theory, these findings are the opposite of what Glazer (1989) and Beetsma and van der Ploeg (2007) predict. They are more consistent with the theoretical prediction displayed in the upper left panel of Figure 1, which is obtained under the restriction that the elasticity of substitution between public goods in utility (ϕ) is lower than the elasticity of substitution between capital and labor in production (ε).

In contrast to the investment effects, current expenditures do not respond to variation in incumbents' support, as shown in Table 7. For all spending categories considered the estimated effects are far from significant. As shown in the lower right panel of Figure 1, this finding is consistent with the theoretical framework in Section 2 if politicians' intertemporal elasticity of substitution (σ) equals unity. However, due to the balanced budget requirement facing the policymakers we study, we do not place much emphasis on this result.

6 Sensitivity Checks

The results reported in the previous section capture the (average) causal effect of changes in re-election probabilities on local decision making as long as the instrument we apply is valid. To investigate our benchmark results we conduct a number of sensitivity checks. First, we include potentially relevant control variables. Second, we exclude local governments where the bloc of the incumbent received more than 2/3 support. Third, we investigate whether yardstick competition is a threat to our exclusion restriction. Finally, we vary the threshold size for municipalities to be included in our sample.

6.1 Control Variables

In our analysis we base our inference on changes in policymaking within election periods. As argued before, this nets out all time-invariant factors. There may however be time-varying factors that affect policymaking and should be included in our model.

Table (8) and (9) report results from specifications including changes in local economic conditions (the unemployment rate, $\Delta Unemp$) and the demographic composition of the population. The demographic variables consists of changes in the number of inhabitants (ΔPop), the share of children (0-6 years) ($\Delta Children$), the share of young (7-15)($\Delta Young$) and the share of elderly (67 years and older)($\Delta Elderly$). These variables are not included in our baseline specification because they may be endogenous due to Tiebout sorting.

The demographic variables mainly have the expected signs. We find that an increasing number of inhabitants in a particular age group is associated with an increase in current expenditures in the relevant sector. For instance, when the share of the population in school age increases, spending on schooling increases. Changes in demographics are less important for investment. Importantly, our key results on the impact of re-election probabilities are basically unaltered when we include control variables.

[Tables (8) and (9) about here.]

6.2 Popularity Shock and Re-Election Probabilities

Our empirical strategy is based on the conjecture that (changes in) the share of votes for the bloc of the incumbent indicates (changes in) re-election probabilities. Section 5.1 showed that this conjecture is reasonable. However, an increase in the support for the incumbent's bloc is unlikely to have the same impact on re-election probabilities for all local governments. For instance, the re-election probability of an incumbent who received 51 percent of the votes in the previous election will be more sensitive to shifts in support than an incumbent who received 81 percent of the votes. The probit regressions that

allow for non-linear effects indicate that this is indeed the case, as illustrated in Figures 2 and 3. Hence, we wish to ascertain whether our results are driven by observations where the bloc of the incumbent is very likely to be re-elected.

In Tables (10) and (11)we present results where local governments that received more than 2/3 of the votes in the previous election are excluded. The estimates are similar to our baseline estimates, indicating that our main results are not driven by local governments where the bloc of the incumbent is almost certain to be re-elected.

[Tables (10) and (11) about here.]

6.3 Yardstick Competition

Policymakers do not act in isolation. A large empirical literature, initiated by Case et al. (1993), documents that local policymakers respond strategically to other localities´ fiscal policies. Such fiscal competition is also found to be relevant in Norway (e.g. Fiva and Rattsø (2007)). Strategic interaction in spending and tax decisions may be driven by different mechanisms, notably expenditure spillovers, competition for mobile tax bases and yardstick competition, and it is empirically challenging to separate these from each other (as discussed by Revelli (2005)). Yardstick competition, implies that voters make use of information about political decisions in neighboring local governments (Salmon (1987), Besley and Case (1995)). The decisions of neighbors carry an information externality, as they provide information against which to evaluate the performance of one's own government (Fiva and Rattsø (2007)).

In the current setting, yardstick competition is a potential problem. If voters in local government i condition their choices at the national election on the performance of their own local incumbent relative to the incumbent in local government j, then the county-wide ideological sentiment (where votes in i are excluded) may be endogenous to local decision making in i. This implies that the exclusion restriction we impose, namely that the county-level change in support for an incumbent does not affect his spending decisions

except through the local re-election probability, may not hold.

To investigate whether yardstick competition does bias our IV estimates, we would like to exclude all local governments that voters in local government i are likely to use as a yardsticks. Empirically, it is not obvious how this should be operationalized. The existing literature estimating spatial econometric reaction functions offers relatively little guidance. The most commonly applied criteria of 'neighborhood' is based on geographic distance, in particular border-sharing, but more distant local governments that share demographic and economic characteristics, may also be relevant yardsticks.

We take two different approaches to investigate the importance of yardstick competition. First, we exclude local governments where the county administration is located. These 'county capitals' are considerably larger than the average local government and consequently get substantial weight when we generate our (population-weighted) instrument.[15] In addition, these local governments may be problematic to include if the county population pays attention to the politics of the 'county capital' (due to e.g. more media coverage). In Tables (12) and (13) we report results where 'county capitals' are excluded. The results are basically unaltered.

[Tables (12) and (13) about here.]

Our second approach is to rely on information on local labor market regions. The labor market regions, 90 in total, are defined by Statistics Norway on the basis of commuting flows across local government borders.

In Tables (14) and (15), we present results where the instrument is based on changes in the regional partisan sentiment, excluding election results from local governments belonging to the same labor market region.

[Tables (14) and (15) about here.]

As expected, the instruments become slightly weaker with the alternative instrument.

[15]The average population size of the 'county capitals' is 56.000.

The aggregate investment effect for right-wing incumbents and the child care effect for left-wing incumbents is still statistically significant at the five percent level.

Because results change little when we exclude local governments based on two plausible definitions of 'neighborhood', we conclude that it is unlikely that our main findings are severely biased by yardstick competition.

6.4 Population Size

In our baseline estimates we exclude local governments with less than 1000 inhabitants. The reason is two-fold. First, the political decision making process is likely to be more consensus oriented in very small municipalities. Second, the lack of volume in budgets of very small local governments limits the scope for strategic use of public capital, and is likely to introduce substantial noise to our estimation since investment in these municipalities will be dominated by single projects.

In this subsection we present results where we vary the threshold size for municipalities to be included in our sample. In Tables (16) and (17) we show results where all local governments are included. In Tables (18) and (19) we exclude local governments with less than 2500 inhabitants (approximately 20 percent of the sample). Finally in Tables (20) and (21) we exclude local governments with less than 4000 inhabitants (approximately 40 percent of the sample). As expected, we find more precise estimates of strategic investment when small local governments are excluded. The point estimates are fairly similar across all these specifications.

[Tables (16) to (21) about here.]

7 Discussion: Theory and the Results

The predictions from our theoretical model, taken from Natvik (2009), were determined by the specific parameter values for the production functions of the public sector and

utility function of the political parties competing for office. The way to evaluate our theory is therefore to ask if there exist reasonable parameter values under which its predictions are consistent with our empirical analysis. At this point, the most important finding is that incumbents tend to invest more when re-election becomes more likely, which is consistent with the model under the assumption that capital and labor are complements, i.e. when ε in the model is low. Based on the existing evidence on macro production functions (see f.ex. Klump et al. (2007) and Antràs (2004)) such a degree of complementarity is reasonable.

In terms of investment composition, our theory is consistent with the empirical findings only if the political parties have a low intratemporal elasticity of substitution (ϕ). For this parameter, we have no empirical evidence to lean on, and hence our finding that higher re-election probabilities make incumbents tilt the composition toward the purposes they prefer more strongly poses no strict test of our model. However, cast against the predictions from Glazer (1989) and Beetsma and van der Ploeg (2007), the composition effect in the data does point toward our framework where capital and labor are complementary inputs to government production.

While the empirical analysis was designed to explore the predictions from our simple theory, our findings may also be used to evaluate alternative models. In particular, a possible force behind strategic investments could be that incumbents attempt to influence their own re-election probability. Two recent studies that emphasize this mechanism are Aidt et al. (2007) and Drazen and Eslava (2005). Both assume that public investments are particularly visible types of public expenditure. Rent-seeking incumbents will therefore invest more when they need to boost their re-election probability, i.e. when electoral competition is perceived as high. Our evidence does not support this prediction because a higher support in the national election indicates a higher re-election probability, and thus less competition in the upcoming election (see Figures 2 and 3). Of course, this does not rule out that incumbents attempt to influence their re-election probabilities when choosing how to invest. But, to the best of our knowledge, existing frameworks cannot

explain our findings.

8 Conclusion

By studying highly comparable entities, municipalities in Norway, and utilizing the overlapping regularity of local and national election terms that characterizes this institutional setting, we have found that incumbent policymakers' adjust their investment policies in response to exogenous shifts in their popularity and re-election probability. Incumbents who experience increased popularity raise investment in the purposes they prefer relatively strongly, as compared to their competitors for office.

This result is interesting for two broad reasons. First, it provides a finding against which we can evaluate politico-economic hypotheses of public investment. We have focused on theoretical frameworks where re-election probabilities are exogenous, and argued that our evidence rejects theories where the returns to public capital are independent of other policy choices, as in Glazer (1989) and Beetsma and van der Ploeg (2007). On the other hand, our evidence is consistent with a framework where the returns to investment in public capital depend on the other inputs that such capital must be combined with to produce public goods, as in Natvik (2009). Hence, our results indicate that it may be important to account for complementarity between public capital and other inputs to public good provision when analyzing public investment in a political equilibrium. Furthermore, while we have not placed much emphasis on frameworks where incumbents choose the composition of investment so as to influence future voting, it may well be that such considerations are important. We believe that our study motivates theoretical investigation into how politicians may choose investment strategies to boost their likelihood of being re-elected.

Second, our results are important for normative considerations as well. A feature of democracies is that whoever is in government at a point in time faces the risk that he will lose influence in the future. It is important to know whether and how this feature

affects which policies are actually implemented, since such knowledge provides guidance as to whether democratically elected governments should face restrictions on the set of policies they may implement. On this issue the literature has traditionally emphasized deficit restrictions, as in Persson and Svensson (1989) and Tabellini and Alesina (1990). For investment, emphasis has been on the aggregate level of capital accumulation, with a central prescription being the "golden rule", which states that investment in physical capital should be exempted from deficit restrictions (f. ex. Bassetto and Sargent (2006)). The institutional setting in which Norwegian municipalities operate is very similar to such a 'golden rule'. Hence, our results show that such a rule is not sufficient to prevent politicians from manipulating the capital stock in response to altered prospects of re-election. Understanding the welfare consequences of such investment behavior seems an important subject for future research.

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A Appendix

A.1 First Period Choices

For notational convenience, and without loss of generality, assume that the incumbent is of type R. Let h_2^J and $n_2^{h,J}$ denote the quantities of good h and labor use for producing good h when party J is in office in period 2, and G^J denote the reaction function of party J. The incumbent's choices of $\left\{n_1^g, n_1^f, k_2^g, k_2^f, b\right\}$ must satisfy the first-order conditions

$$u_g\left(g_1, f_1|\alpha^R\right) g_n\left(n_1^g, k_1^g\right) = u_f\left(g_1, f_1|\alpha^R\right) f_n(n_1^f, k_1^f) \tag{13}$$

$$\left\{\begin{array}{c} u_g\left(g_1, f_1|\alpha^R\right) g_n\left(n_1^g, k_1^g\right) \\ -p_R\left[u_g\left(g_2^R, f_2^R|\alpha^R\right) g_n\left(n_2^{g,R}, k_2^g\right)\right] \\ +(1-p_R)\left[\begin{array}{c} u_g\left(g_2^L, f_2^L|\alpha^R\right) g_n(n_2^{g,L}, k_2^{g,L}) G_b^L \\ +u_f\left(g_2^L, f_2^L|\alpha^R\right) f_n(n_2^{f,L}, k_2^{f,L}) F_b^L \end{array}\right] \end{array}\right\} = 0 \tag{14}$$

$$\left\{\begin{array}{c} -u_g\left(g_1, f_1|\alpha^R\right) g_n\left(n_1^g, k_1^g\right) \\ +p_R\left[u_g\left(g_2^R, f_2^R|\alpha^R\right) g_k(n_2^{g,R}, k_2^g)\right] \\ +(1-p_R)\left[\begin{array}{c} u_g\left(g_2^L, f_2^L|\alpha^R\right) g_n(n_2^{g,L}, k_2^g) G_{k_2^g}^L \\ +u_f\left(g_2^L, f_2^L|\alpha^R\right) f_n(n_2^{f,L}, k_2^f) F_{k_2^g}^L \\ +u_g\left(g_2^L, f_2^L|\alpha^R\right) g_k(n_2^{g,L}, k_2^g) \end{array}\right] \end{array}\right\} = 0 \tag{15}$$

$$\left\{\begin{array}{c} -u_g\left(g_1, f_1|\alpha^R\right) g_n\left(n_1^g, k_1^g\right) \\ +p_R\left[u_f\left(g_2^R, f_2^R|\alpha^R\right) f_k(n_2^{f,R}, k_2^f)\right] \\ (1-p_R)\left[\begin{array}{c} u_g\left(g_2^L, f_2^L|\alpha^R\right) g_n(n_2^{g,L}, k_2^g) G_{k_2^f}^L \\ +u_f\left(g_2^L, f_2^L|\alpha^R\right) f_n(n_2^{f,L}, k_2^f) F_{k_2^f}^L \\ +u_f\left(g_2^L, f_2^L|\alpha^R\right) f_k(n_2^{f,L}, k_2^f) \end{array}\right] \end{array}\right\} = 0 \tag{16}$$

in addition to the budget constraint (2). These are the first-order conditions for labor hiring, debt accumulation, investment in purpose g and investment in purpose f.

Table 1: Parametrization

Parameter	Value	Parameter	Value	Parameter	Value
δ	0.2	γ	0.7	α^R	0.6
ε	0.7	σ	1	α^D	0.4
ϕ	0.5				

Table 2: Descriptive Statistics: Investment and Current Expenditures per Capita in NOK 1000 (deflated to 1998 levels)

Variable	Mean	Std. Dev.	Min.	Max.
InvAggregate	1.138	1.242	-15.632	12.247
InvEducation	0.663	0.820	-5.198	9.017
InvElderlyCare	0.396	0.901	-16.11	10.986
InvChildCare	0.08	0.183	-1.409	3.2
CurrAggregate	10.635	4.925	3.498	48.125
CurrEducation	5.822	1.462	2.551	16.267
CurrElderlyCare	3.95	3.181	0.106	34.124
CurrChildCare	0.864	0.844	0	4.922
N		3446		

Table 3: Descriptive Statistics: Political Variables.

Variable	Mean	Std. Dev.	Min.	Max.	N
mayor_left	0.456	0.498	0	1	1723
mayor_right	0.544	0.498	0	1	1723
voteshare_left	0.449	0.146	0.062	0.832	1723
voteshare_right	0.55	0.146	0.167	0.938	1723
SupportLocalElection	0.615	0.103	0.235	0.938	1723
SupportNationalElection	0.593	0.096	0.222	0.908	1723
reelection	0.825	0.38	0	1	1706
$\Delta Support$	-0.018	0.041	-0.243	0.192	1723
$\Delta Support^{county}$	-0.005	0.025	-0.066	0.072	1723

Table 4: Information from Parliamentary Election

	(1) reelection	(2) reelection	(3) reelection	(4) reelection
SupportLocalElection	4.61***	6.71***	0.14	-0.23
	(7.32)	(9.98)	(0.10)	(-0.17)
SupportNationalElection			5.31***	7.84***
			(3.54)	(5.70)
Constant	-1.89***	-2.83***	-2.24***	-3.23***
	(-4.79)	(-7.80)	(-5.43)	(-8.63)
N	929	777	929	777
pseudo R^2	0.077	0.156	0.093	0.199
Estimation Method	Probit	Probit	Probit	Probit
Block of Mayor	Right	Left	Right	Left

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: First Stage Regressions, the Dependent Variable is $\Delta Support$

	(1) Right	(2) Left
$\Delta Support^{County}$	0.48***	0.60***
	(7.24)	(8.29)
N	937	786
R^2	0.179	0.292
Estimation Method	OLS	OLS

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 6: Investment on Probability of Re-election

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	13.90***	9.59*	9.16*	2.85
	(2.61)	(1.81)	(1.73)	(0.54)
N	937	937	937	937
Block of Mayor	Right	Right	Right	Right
Est. Method	IV	IV	IV	IV
F-statistic from 1st.	52.45	52.45	52.45	52.45

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	5.86	1.22	3.45	16.58***
	(1.37)	(0.32)	(0.76)	(3.53)
N	786	786	786	786
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	68.75	68.75	68.75	68.75

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 7: Current Expenditures on Probability of Re-election

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	0.44	0.56	0.25	0.57
	(0.66)	(0.56)	(0.30)	(0.67)
N	937	937	937	937
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	52.45	52.45	52.45	52.45

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	0.07	-0.03	0.40	-1.06
	(0.11)	(-0.04)	(0.48)	(-1.63)
N	786	786	786	786
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	68.75	68.75	68.75	68.75

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 8: Control Variables Included: Investment

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	13.71**	9.25*	9.14*	3.18
	(2.57)	(1.75)	(1.71)	(0.60)
ΔPop	-0.12	-0.02	-0.12	-0.05
	(-0.80)	(-0.16)	(-0.80)	(-0.34)
$\Delta Children$	4.58	10.41	-5.63	6.96
	(0.43)	(0.98)	(-0.53)	(0.65)
$\Delta Young$	9.80	28.89***	-11.37	-12.20
	(1.00)	(2.96)	(-1.16)	(-1.24)
$\Delta Elderly$	-9.71	6.38	-14.75	-17.56
	(-0.88)	(0.58)	(-1.34)	(-1.59)
$\Delta Unemp$	-4.38	-10.44	3.62	-1.95
	(-0.50)	(-1.20)	(0.41)	(-0.22)
N	937	937	937	937
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	51.95	51.95	51.95	51.95

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	5.79	1.40	3.22	16.37***
	(1.36)	(0.37)	(0.72)	(3.50)
ΔPop	0.05	0.01	0.03	-0.02
	(0.28)	(0.07)	(0.14)	(-0.11)
$\Delta Children$	0.58	11.39	-9.23	-0.82
	(0.05)	(1.06)	(-0.72)	(-0.06)
$\Delta Young$	-11.48	-4.53	-8.80	-15.39
	(-1.03)	(-0.45)	(-0.74)	(-1.25)
$\Delta Elderly$	21.56*	10.93	17.19	7.40
	(1.71)	(0.97)	(1.29)	(0.54)
$\Delta Unemp$	8.77	-1.55	13.30	2.13
	(1.13)	(-0.22)	(1.63)	(0.25)
N	786	786	786	786
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	69.14	69.14	69.14	69.14

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 9: Control Variables Included: Current Expenditures

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	0.32	0.21	0.21	0.63
	(0.49)	(0.21)	(0.26)	(0.74)
ΔPop	-0.05**	-0.03	-0.05**	-0.01
	(-2.57)	(-1.10)	(-2.44)	(-0.43)
$\Delta Children$	-0.20	-5.85***	1.78	2.16
	(-0.15)	(-3.02)	(1.09)	(1.26)
$\Delta Young$	4.50***	7.24***	3.97***	-1.25
	(3.72)	(4.05)	(2.64)	(-0.79)
$\Delta Elderly$	2.08	-2.01	4.88***	-2.55
	(1.54)	(-1.00)	(2.89)	(-1.44)
$\Delta Unemp$	-1.19	-3.74**	0.27	-1.59
	(-1.10)	(-2.34)	(0.20)	(-1.13)
N	937	937	937	937
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	51.95	51.95	51.95	51.95

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	0.14	0.02	0.50	-1.08*
	(0.24)	(0.03)	(0.60)	(-1.68)
ΔPop	-0.05*	-0.04	-0.05	-0.00
	(-1.76)	(-1.18)	(-1.45)	(-0.09)
$\Delta Children$	-1.51	-4.73**	0.22	-1.51
	(-0.90)	(-2.22)	(0.09)	(-0.83)
$\Delta Young$	2.24	7.30***	0.78	-2.78*
	(1.43)	(3.69)	(0.36)	(-1.65)
$\Delta Elderly$	3.69**	-3.04	6.65***	1.43
	(2.10)	(-1.36)	(2.73)	(0.75)
$\Delta Unemp$	-3.90***	-2.68**	-3.70**	-3.96***
	(-3.62)	(-1.96)	(-2.47)	(-3.40)
N	786	786	786	786
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	69.14	69.14	69.14	69.14

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 10: Inc. Receiving More Than 2/3 of Votes in Last Election Excl.: Investment

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	15.10**	6.99	12.52	4.69
	(2.15)	(1.11)	(1.59)	(0.86)
N	550	550	550	550
Block of Mayor	Right	Right	Right	Right
Est. Method	IV	IV	IV	IV
F-statistic from 1st.	30.81	30.81	30.81	30.81

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	5.29	0.96	2.87	16.71***
	(1.04)	(0.21)	(0.53)	(3.28)
N	658	658	658	658
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	54.23	54.23	54.23	54.23

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 11: Inc. Receiving More Than 2/3 of Votes in Last Election Excl.: Current Exp.

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	-0.28	1.14	-0.88	-0.38
	(-0.33)	(0.87)	(-0.83)	(-0.37)
N	550	550	550	550
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	30.81	30.81	30.81	30.81

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	0.43	-0.54	0.97	-0.21
	(0.61)	(-0.61)	(1.00)	(-0.28)
N	658	658	658	658
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	54.23	54.23	54.23	54.23

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 12: County Administration Local Governments Excluded: Investment

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	12.29**	9.03*	8.22	-1.62
	(2.33)	(1.70)	(1.56)	(-0.30)
N	891	891	891	891
Block of Mayor	Right	Right	Right	Right
Est. Method	IV	IV	IV	IV
F-statistic from 1st.	53.02	53.02	53.02	53.02

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	4.49	-0.78	3.51	16.15***
	(1.12)	(-0.22)	(0.82)	(3.66)
N	749	749	749	749
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	76.76	76.76	76.76	76.76

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 13: County Administration Local Governments Excluded: Current Expenditures

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	0.68	0.48	0.51	1.10
	(1.02)	(0.48)	(0.62)	(1.27)
N	891	891	891	891
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	53.02	53.02	53.02	53.02

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	-0.29	-0.12	-0.01	-1.42**
	(-0.51)	(-0.17)	(-0.02)	(-2.31)
N	749	749	749	749
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	76.76	76.76	76.76	76.76

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 14: Alternative Instrument: Investment

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	12.08**	11.30*	5.51	0.39
	(2.00)	(1.83)	(0.92)	(0.06)
N	937	937	937	937
Block of Mayor	Right	Right	Right	Right
Est. Method	IV	IV	IV	IV
F-statistic from 1st.	39.05	39.05	39.05	39.05

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	8.25*	3.04	4.89	16.95***
	(1.69)	(0.71)	(0.96)	(3.21)
N	786	786	786	786
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	53.87	53.87	53.87	53.87

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 15: Alternative Instrument: Current Expenditures

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	0.53	0.50	0.45	0.48
	(0.70)	(0.44)	(0.48)	(0.49)
N	937	937	937	937
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	39.05	39.05	39.05	39.05

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	0.21	0.38	0.47	-1.16
	(0.31)	(0.43)	(0.50)	(-1.60)
N	786	786	786	786
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	53.87	53.87	53.87	53.87

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 16: Local Gov. With Population > 0 Included: Investment

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	14.65**	9.52	9.80*	5.08
	(2.41)	(1.60)	(1.69)	(0.92)
N	976	976	976	976
Block of Mayor	Right	Right	Right	Right
Est. Method	IV	IV	IV	IV
F-statistic from 1st.	45.01	45.01	45.01	45.01

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	4.58	1.59	1.38	16.20***
	(0.98)	(0.40)	(0.27)	(3.31)
N	798	798	798	798
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	58.38	58.38	58.38	58.38

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 17: Local Gov. With Population > 0 Included: Current Expenditures

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	0.45	0.56	0.09	1.21
	(0.63)	(0.53)	(0.10)	(1.28)
N	976	976	976	976
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	45.01	45.01	45.01	45.01

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	0.01	0.17	0.27	-1.27*
	(0.01)	(0.21)	(0.31)	(-1.82)
N	798	798	798	798
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	58.38	58.38	58.38	58.38

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 18: Local Gov. With Population > 2500 Included: Investment

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	19.79***	13.63**	13.71**	5.34
	(3.15)	(2.28)	(2.26)	(1.08)
N	763	763	763	763
Block of Mayor	Right	Right	Right	Right
Est. Method	IV	IV	IV	IV
F-statistic from 1st.	34.76	34.76	34.76	34.76

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	2.54	2.89	-1.48	9.94***
	(0.61)	(0.73)	(-0.34)	(2.86)
N	669	669	669	669
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	90.01	90.01	90.01	90.01

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 19: Local Gov. With Population > 2500 Included: Current Expenditures

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	-0.53	-0.66	-0.71	0.60
	(-0.77)	(-0.56)	(-0.82)	(0.62)
N	763	763	763	763
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	34.76	34.76	34.76	34.76

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	0.02	0.16	0.29	-1.35**
	(0.04)	(0.22)	(0.37)	(-2.17)
N	669	669	669	669
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	90.01	90.01	90.01	90.01

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 20: Local Gov. With Population > 4000 Included: Investment

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	16.92**	11.17	13.16*	-0.21
	(2.13)	(1.45)	(1.70)	(-0.03)
N	513	513	513	513
Block of Mayor	Right	Right	Right	Right
Est. Method	IV	IV	IV	IV
F-statistic from 1st.	18.83	18.83	18.83	18.83

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	-1.85	1.14	-5.48	7.62**
	(-0.45)	(0.31)	(-1.22)	(2.08)
N	557	557	557	557
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	89.01	89.01	89.01	89.01

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Table 21: Local Gov. With Population > 4000 Included: Current Expenditures

	(1) Aggregate	(2) Education	(3) Elderly Care	(4) Child Care
$\Delta Support$	0.06	-1.32	0.18	1.98
	(0.07)	(-0.82)	(0.17)	(1.47)
N	513	513	513	513
Block of Mayor	Right	Right	Right	Right
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	18.83	18.83	18.83	18.83

	(5) Aggregate	(6) Education	(7) Elderly Care	(8) Child Care
$\Delta Support$	-0.40	-0.18	-0.22	-1.30**
	(-0.82)	(-0.24)	(-0.36)	(-2.10)
N	557	557	557	557
Block of Mayor	Left	Left	Left	Left
Estimation Method	IV	IV	IV	IV
F-statistic from 1st.	89.01	89.01	89.01	89.01

Notes: t statistics in parentheses, * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$. Election period fixed effects included in all specifications.

Figure 1: The effect of a higher re-election probability on policy. All plots show the percentage point difference from the respective outcome when $p_R = 0$.

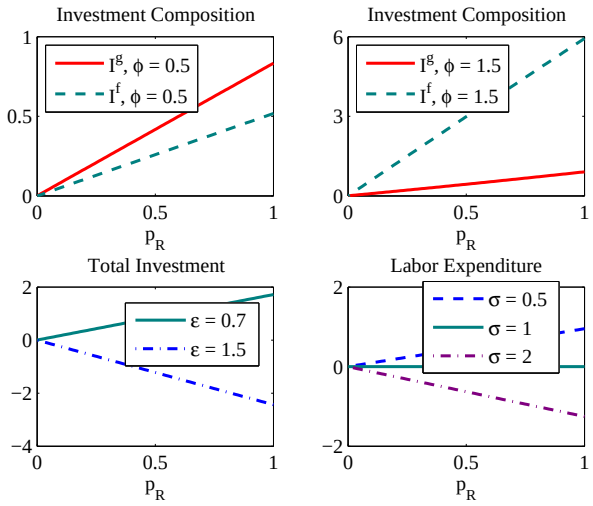

Figure 2: Predictions Based on Previous Election Outcomes, Right Bloc

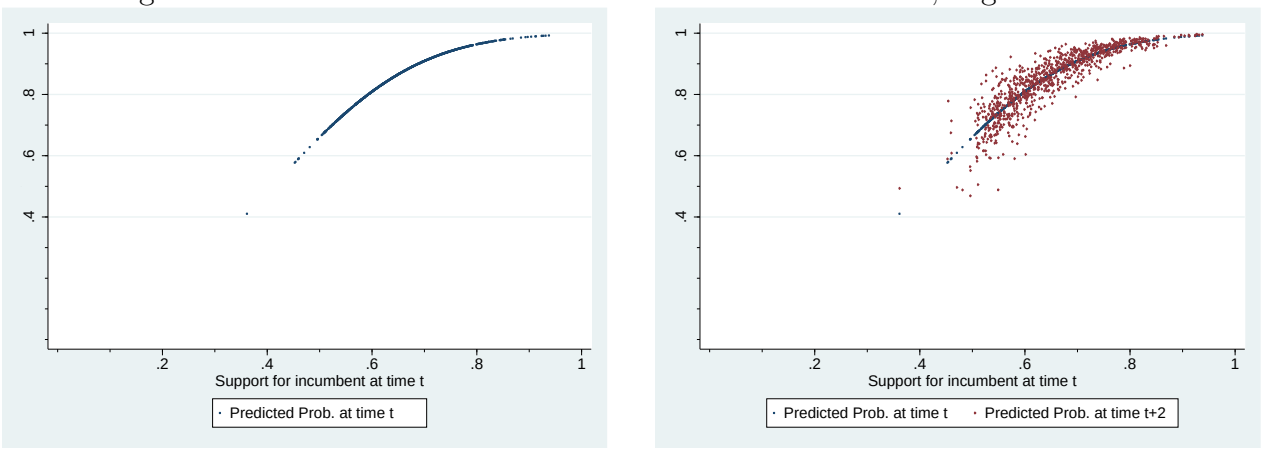

Figure 3: Predictions Based on Previous Election Outcomes, Left Bloc