

Fiscal Policy, Government Polarization, and the Economic Literacy of Voters

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Abstract

We model a two-parties electoral game in an environment where voters are imperfectly informed on the administrative ability of each party. In equilibrium, parties try to manipulate voters' beliefs and implement fiscal policies that are looser than the socially optimal ones. The size of such a distortion increases with the incentive of parties to manipulate, the voters' information disadvantage, and the interaction between these two elements. We test our theoretical predictions on a sample of 23 OECD countries over the period 1999–2008. We measure the *incentive* to manipulate voters' beliefs through the ideological cohesion of the cabinet (i.e. government polarization), and the *scope* to manipulate such beliefs through voters' level of economic literacy. We find that polarized governments tend to worsen fiscal balances, and this is more likely in countries where the level of voters' economic literacy is low. However, such impact becomes negligible as literacy increases, suggesting that polarization leads to biased fiscal policies only when there is enough room for manipulation. As additional evidence, we find that right-wing tend to have higher deficits than left-wing governments. Our results remain stable after controlling for: cross-country exogenous variations in country size, political stability and ethnic fractionalization; potentially confounding differences across countries and over time (e.g., individuals' education attainments, electoral or institutional systems); several types of falsification tests.

Keywords: Budget balance; government polarization; electoral game; economic literacy.

JEL Codes: D72; E62; H62.

I. Introduction

Advanced democracies usually exhibit higher public deficits and debt accumulations than they would do with a social planner. The explanation generally advanced by economists is that policymakers are moved by political objectives in addition – or even in substitution – to the economic ones.¹ In this work, we contribute to this view by investigating the behavior of politicians in seeking consensus and how the contingencies associated with this behavior affect the conduct of fiscal policy.

The search for consensus has always been central in the political economy literature, and previous works have shown that such a search leads to an incentive to excessive spending. However, there is a distinctive difference between the early and the more recent literature. While early contributions assume that voters fail to understand the intertemporal budget constraint and thus politicians exploit this fiscal illusion to boost their consensus through profligate policies (Buchanan and Wagner 1977), more recent contributions assume that voters are fully rational. Notably, Rogoff (1990) assumes voters as rational but imperfectly informed on the administrative abilities of policymakers. Thus, to signal high abilities or induce the belief of high abilities, governments implement excessively loose policies before the election. In short, the incumbent uses fiscal discretion to manipulate voter's beliefs.

In this work, we follow the rational voter literature and stress the importance of the determinants of imperfect information. The novelty of this contribution lies in what makes a voter unable to assess the abilities of politicians: her/his poor understanding of economic affairs. We claim that voters with high levels of economic competence are able to access and properly process information on the ability of politicians. Thus, these voters may be assumed as being perfectly informed. Conversely, voters with low levels of economic competence are unable to get and process the available information on the quality of politicians and, therefore, such voters are imperfectly informed. Hence, for a given manipulation *incentive*, the incidence of economically incompetent voters represent the *scope* of manipulation.

In principle, the ability to assess the skills of politicians does not only rely on the economic competence of voters but also on the amount and the quality of information available to them. Yet, we prefer to focus on the economic competence for two reasons. First, since the burst of the sub-prime crisis in 2008, many economists have been becoming skeptical on the benefits of sheer

¹ Alesina and Tabellini (1990a) argue that the government in office creates excessive debt to limit the policy discretion of the next government. Weingast, Shepsle, and Johnsen (1981) and Battaglini and Coate (2008) argue that excessive spending comes from a common pool problem. This arises when expenditure items benefit single constituencies but are financed by all voters. Finally, Cukierman and Meltzer (1989) argue that governments are pressed to overspend by current generations because stabilization policies will stand on the shoulders of future generations.

information for rational judgement. Cognitive skills and specific knowledge appear to be at least as important as free access to unbiased and detailed information (Lusardi and Mitchell 2014). Second, the role of information quality and availability has already been studied in other works, which are complementary to ours (e.g. Alt and Lassen 2006; Shi and Svensson 2006; Alesina, Campante, and Tabellini 2008). In addition, previous studies did not use reliable data about economic competences because such data have only become available in recent years (Jappelli 2010).²

To cast the empirical evidence within a tailored theoretical framework we build a model where on the eve of an electoral round two parties compete for government and announce the fiscal policy they will implement after a successful electoral outcome. The two parties differ for their administrative ability but economically incompetent voters are unable to assess this difference. In this setting, we show that in equilibrium the two parties announce and implement fiscal policies that are looser than the socially optimal ones. The size of the distortion increases with the incentive to manipulate voters' beliefs, the share of illiterate voters, and the interaction between these two elements.

The empirical analysis is based on a sample of 23 OECD countries that are observed over the 1999-2008 period. As to the *incentive* to manipulate voters, we measure it with a variable indicating whether the government is polarized, that is whether cabinet members are ideologically cohesive.³ The rationale behind this choice is the following. In a polarized political environment, parties or party coalitions have very different preferences regarding both the size of the public sector and the nature of public goods to be produced (Alesina and Tabellini 1990a). Hence, parties or party coalitions have strong incentives to win the election because the loser party is bound to bear the implementation of policies that are highly distant from its own ideal. Then, parties or party coalitions compete fiercely and announce different policies.⁴ By contrast, in a non-polarized environment, political parties or coalitions have similar preferences in terms of policies to be implemented and so the incentive to win the election is lower. In the contributions close to ours (Alt and Lassen 2006; Shi and Svensson 2006), the incentive to win the election is ascribed to the ability of parties to extract rents once in office. Accordingly, this incentive is captured with some index of perceived corruption. In that context, the rationale is that perceived corruption measures how much

² Shi and Svensson (2006) explicitly acknowledge the role of cognitive skills in processing the available information but, due to the lack of data, they do not perform any empirical test.

³ It is worth noting that ideological polarization does not necessarily mean the presence of a single party in the cabinet, as in winner-take-all electoral systems (e.g. in the United States and in the United Kingdom). Indeed, a polarized government can be composed of many political parties which form a coalition by sharing the same political values and ideology to win the election (e.g. in Germany and in Italy left-wing and right-wing parties usually form left-wing and right-wing coalitions).

⁴ Borrowing the idea of “monitoring” from the corporate governance literature, it is worth noting that – after the election – strongly cohesive governments have sufficient political power to avoid the monitoring of the other parties not in office, and thus put effectively forward the policies they announced before the elections.

public officials can exploit their position for extracting private benefits. In our work, the focus on advanced economies has led us to discard rent extraction as the key driver behind political competition. In these countries, civic attitudes and law enforcement are generally strong, so that there is comparatively less room for rent extraction than in other (developing and/or underdeveloped) countries.

As to the *scope* to manipulate voters, we measure voters' economic competence by means of their economic literacy. In this respect, a valuable feature of our data is that economic literacy is highly variable across-countries. This adds a further reason to capture informational asymmetries through the ability of processing information instead of the mere diffusion of information. For, the latter is likely to exhibit a limited variability across advanced countries.

The picture arising from the empirical evidence is consistent with our priors. We find that higher polarization is associated to worsen fiscal balances, and this association is stronger in countries where the level of voters' economic literacy is low. In fact, the impact of polarization on the balance becomes negligible as literacy increases, suggesting that polarization leads to biased fiscal policies only when there is enough room for manipulation. As additional evidence, we find that right-wing tend to have higher deficits than left-wing governments. Our results remain stable after controlling for: cross-country exogenous variations in country size, political stability and ethnic fractionalization; potentially confounding differences across countries and over time (e.g., individuals' education attainments, electoral or institutional systems) and several types of falsification tests.

Our paper contributes to two lines of research. First, it enriches – and derives the main insights from – the “rational voter” literature opened by Rogoff and Sibert (1988) and Rogoff (1990). These seminal contributions are the first arguing that governments distort fiscal policies to signal high administrative skills to uninformed voters. Close to the spirit of our work, Alt and Lassen (2006) argue that signaling is relevant only in countries where the budget formation is not transparent. Building on this intuition, they develop a reliable method for measuring budgetary transparency and show that fiscal discipline tends to be looser in countries that are less transparent. In the same vein, Persson and Tabellini (2003) and Brender and Drazen (2005) find that political effects on public budgets would exist only in certain countries (respectively, developed economies and “new democracies”). Finally, Shi and Svensson (2006) argue that fiscal discipline depends on the share of informed voters and provide supportive empirical evidence on a sample of 85 (developed and developing) countries. However – differently from the present work – the authors proxy the share of informed voters with a measure of information diffusion (i.e. access to media measured by radios

per capita coupled with country's freedom of broadcasting), and not with a measure of voters' ability to process information.

Second, we aim to extend the literature on the effects of economic and financial literacy to a new dimension. To the best of our knowledge, this strand of literature – surveyed by Lusardi and Mitchell (2014) – has focused exclusively on the impact of economic literacy on a set of microeconomic decisions. For instance, a recent contribution by Jappelli and Padula (2013) explores the link between individual financial competence and saving behavior, while others focus on the role of financial competence for individual wealth accumulation, portfolio choice and retirement decisions (e.g., Lusardi and Mitchell 2007; Behrman et al. 2010; Jappelli and Padula 2015). In this paper, our contention is that economic competences are relevant not only for the individual behavior but also for collective actions. As to these latter, in this work we investigate government's implementation of fiscal policies but economic competences may be relevant for other welfare relevant collective decisions.

The paper proceeds as follow. Section II describes the model and derives the theoretical predictions. Section III describes the data, discusses the empirical strategy, and tests the predictions of the model. Section IV and Section V show a set of robustness checks and provide additional evidence. Finally, Section VI concludes.

II. The Model

II.A. Environment

The model studies the decisions of two political parties (A and B) and of a unit mass of voters in the eve of an electoral competition. The decision of each party concerns the design of a policy platform to propose to voters. This platform consists in announcing taxes that will be levied and public goods that will be provided in case of electoral win. The decision of each voter consists in choosing the party to vote for.

The events following the election are completely determined by these decisions. Indeed, after the election, the party that obtains the majority of votes runs the government and implements the announced policy. This amounts to assume that the reputational cost of deviating from pre-election announcements is prohibitively large.⁵

The welfare of voter i under the rule of party j is given by the sum of two terms: the first is the pure economic welfare, while the second represents her/his political preferences:

⁵ See Aragonès, Postlewaite, and Palfrey (2007).

$$U(c_j, g_j, s_j; \theta_j, \varepsilon_i, z) = V(c_j, g_j, s_j) + \theta_j(\varepsilon_i + z) \quad j = A, B \quad (1)$$

$$V(c_j, g_j, s_j) \equiv \frac{1 + \gamma}{\gamma} \cdot \min(c_j, \gamma g_j) - \frac{1}{2} [T - s_j]^2 \quad (2)$$

Economic welfare V is common to all individuals. The first component of V conveys the utility from consumption, while the second component conveys the concern for the sustainability of public finances. As to the first component, c_j and g_j represent the individual consumption of private and public goods respectively. These goods are perfect complements with parameter γ controlling for proportions. As to the second component, s_j represents the public budget surplus while T is a parameter that represents the desirable surplus from the perspective of financial markets and/or rating agencies. Thus, voters dislike discrepancies between the actual and the desired surplus.⁶

Turning to political preferences, θ_j is a dummy that takes value one if $j = A$, and zero otherwise. The sum $\varepsilon_i + z$ measures the preference of the individual i for party A. The term ε_i is non-stochastic and subjective, and may be interpreted as a personal trait that captures how close are the views of the individual to those of party A. Conversely, z captures elements of preference that are common to all individuals and whose electoral impact is *ex-ante* uncertain (the appeal of candidates, for instance). We assume that the cross-individual distribution of $\varepsilon_{(\cdot)}$ is zero-mean and symmetric. Further, we assume that z is extracted from a density distribution that is uniform over the support $[-\bar{z}/2, \bar{z}/2]$.

Each voter is endowed with resources y , which are used for private consumption after the government has levied lump sum taxes:

$$c_j = y - t_j \quad (3)$$

In turn, taxes are used to provide public goods and to finance the surplus. Public goods are produced through the following linear technology:

$$g_j = t_j - s_j + \eta_j \quad (4)$$

The difference $t_j - s_j$ represents the resources that are used as inputs in the provision of public goods, while η_j represents the ability of the government in generating output from given inputs.

We assume that parties are endowed with different abilities in the sense that, before the election, nature extracts the ability of each party from two identical but independent distributions. Crucially,

⁶ The quadratic form also implies a loss of welfare when the actual surplus is larger than the desired surplus. However, this occurrence is ruled out in equilibrium.

we also assume that not all voters are able to observe the abilities that have been extracted. A fraction $1 - \sigma$ of voters is composed of individuals with a poor understanding of economic affairs. These individuals are thus unable to assess the administrative competence of parties.

Finally, we use P^j to represent the probability for party j to get the majority of votes and assume that the objective of this party is:

$$V(c_j, g_j, s_j) + \rho P^j \quad j = A, B \quad (5)$$

This amounts to assume that party j is concerned with the aggregate social welfare and with the probability of winning the office. The relative weight associated to the two objectives depends on ρ .

The sequence of actions is the following. First, nature extracts the abilities of parties and privately reveals to each party its own type. Second, parties simultaneously announce their electoral platforms, i.e. taxes and public goods. Third, nature extracts z . Finally, voters observe the announced platforms and cast their vote. The party that obtains the majority of votes is entitled to run the government and to implement the announced policy.

II.B. Voters

Each voter casts her/his vote to the party that attains the better combination of economic welfare and political appeal. Thus, focusing on an individual that observes the abilities of parties and exhibits $\varepsilon = 0$ (median voter), she/he votes for the party j if:

$$V(c_j, g_j, s_j) - V(c_{j'}, g_{j'}, s_{j'}) \geq (\theta_{j'} - \theta_j)z \quad j, j' = A, B \quad (6)$$

Conversely, a median voter that does not observe the abilities of parties votes for the party j if:

$$V(c_j, g_j + E(s_j | t_j, g_j)) - V(c_{j'}, g_{j'}, E(s_{j'} | t_{j'}, g_{j'})) \geq (\theta_{j'} - \theta_j)z \quad (7)$$

Since abilities are unknown, the individual does not observe $s_j (= t_j - g_j + \eta_j)$ but she/he needs to form an expectation. This expectation is conditional on the announced policy as the policy is decided after the party has extracted its own ability and, henceforth, may convey information on it. Due to the symmetric distribution of ε_0 , the probability for party j to get the majority of votes coincides with the probability that the median voter votes for j . On the basis of equations (6) and (7), this probability reads as follows:

$$\begin{aligned}
P^j &= \frac{1}{2} + \frac{\sigma}{z} [V(c_j, g_j, s_j) - V(c_{j'}, g_{j'}, s_{j'})] \\
&+ \frac{1-\sigma}{z} [V(c_j, g_j + E(s_j|t_j, g_j)) - V(c_{j'}, g_{j'}, E(s_{j'}|t_{j'}, g_{j'}))]
\end{aligned} \tag{8}$$

The expression in the first square brackets refers to the probability that an informed median voter votes for j , while the expression in the second square brackets refers to the same probability for an uninformed median voter.

II.C. Parties

Party j announces the policy platform that solves the following problem:

$$\begin{aligned}
\langle t_j, g_j \rangle &= \operatorname{argmax} V(c_j, g_j, s_j) + \rho P^j \\
&s.t. \text{ eq. (3), (4) and (8)}
\end{aligned} \tag{9}$$

To solve this problem one needs a mechanism that describes how the uninformed voter forms the expectation on s_j or, equivalently, on η_j conditional on the announced policy platform. This means that, in equilibrium, expectations depend on the policy while the policy depends on how expectations are formed.

We tackle the interdependence between policy and expectations by resorting to the method of undetermined coefficients. This amounts to conjecture a policy function with unknown parameters and to derive expectations on the basis of this conjecture. Parameters are pinned down by imposing consistency between the conjecture and optimal behavior.

More in detail, we conjecture that the two policy functions are linear with respect to the ability of each party:⁷

$$t_j = \alpha_t + \beta_t \eta_j \quad g_j = \alpha_g + \beta_g \eta_j \tag{10}$$

This means that either t_j or g_j are sufficient statistics for η_j so that the uninformed voter may infer η_j either from t_j or from g_j . We conjecture that a fraction μ (< 1) of uninformed voters use t_j for inference and the complementary fraction $1 - \mu$ uses g_j . This implies the following expression for the average expected value of η_j :

$$E(\eta_j | t_j, g_j) = \mu \frac{t_j - \alpha_t}{\beta_t} + (1 - \mu) \frac{g_j - \alpha_g}{\beta_g} \quad 0 \leq \mu \leq 1 \tag{11}$$

⁷ Linearity represents an educated guess as the full information version of the model provides linear policy functions.

This equation illustrates the key mechanism of the model. Party j is aware that the uninformed voters use the announced policy platform to infer its type η_j . Thus, the party has an incentive to set a policy platform that foregoes some social welfare in case of electoral success in exchange of an increase in the chance of success.

Using the inference rule (11) in problem (9) and imposing consistency between the actual and the conjectured policy, one finds the following solution:⁸

$$t_j = t_j^{SW} - \frac{\gamma}{1+\gamma} B \quad t_j^{SW} \equiv \frac{\gamma}{1+\gamma} \left(\frac{y}{\gamma} + T - 1 \right) - \frac{\gamma}{1+\gamma} \eta_j \quad (12)$$

$$g_j = g_j^{SW} + \frac{1}{1+\gamma} B \quad g_j^{SW} \equiv \frac{1}{1+\gamma} (y - T + 1) + \frac{1}{1+\gamma} \eta_j \quad (13)$$

$$B \equiv \frac{\rho(1-\sigma)}{\bar{z} + \sigma\rho} \quad (14)$$

The policy is presented in terms of deviations from the policy that attains the maximum social welfare (denoted by SW). Firstly, notice that μ is irrelevant for the results. Thus, the equilibrium policy does not depend on the fraction of agents that use announced taxation or announced expenditure to infer the competence of politicians. More importantly, notice that the search for consensus imposes a deviation from the socially optimal policy. This deviation is uniquely conveyed by the non-negative term B , which is nil if party j is not concerned with the electoral outcome ($\rho = 0$) or, alternatively, if there are no voters whose inference can be manipulated ($\sigma = 1$). Finally, notice that the search for consensus moves the tax policy downward and the expenditure policy upward. As a result, the fiscal surplus turns out to be smaller than the socially optimum level:

$$s_j = s^{SW} - B \quad s^{SW} \equiv T - 1 \quad (15)$$

II.D. Comparative Statics

The theoretical mechanism underlying the policy distortion is standard in contexts of asymmetric information. If voters expected the implementation of the social optimum, parties would be tempted to announce, and implement, fiscal policies that are looser than the social optimum. This happens for two reasons. First, deviating from the social optimum entails a small welfare loss (second order). Second, announcing low taxes and/or large expenditure conveys the impression of being of a type that possesses high administrative skills. Clearly, the social optimum cannot be an equilibrium as the above temptation would be anticipated by voters. By the same token, the equilibrium policy

⁸ See the Appendix A for technical details.

must be such that voters' expectations are fulfilled or, equivalently, that parties are induced to reveal their true type. In the model, this truth-telling requirement is provided by the distortion from the social optimum.

The key message of the model is that the search for political consensus generates a bias towards a lower public balance. The size of the bias increases with the temptation to manipulate voters under the socially optimal policy. In turn, this temptation depends on the concern of parties for taking the office - captured by ρ - and on the fraction $1 - \sigma$ of voters that can be potentially manipulated. In the paper we refer to ρ as the *incentive* to manipulate and to $1 - \sigma$ as the *scope* for manipulation.

The following equations summarize the impact on the public balance of variations in the incentive and the scope for manipulation and of their interaction:

$$\frac{ds_j}{d\rho} = -\frac{\bar{z}(1-\sigma)}{(\bar{z} + \sigma\rho)^2} < 0 \quad \frac{ds_j}{d\sigma} = \rho_j \frac{\bar{z} + \rho}{(\bar{z} + \sigma\rho)^2} > 0 \quad (16)$$

$$\frac{d^2s_j}{d\rho d\sigma} = \bar{z} \frac{\bar{z} + \rho(2-\sigma)}{(\bar{z} + \sigma\rho)^3} > 0 \quad (17)$$

On the basis of these derivatives we expect fiscal policy to be looser in countries where parties have a stronger incentive to stay in office and where the fraction of informed voters is smaller. In addition, we expect that the negative impact of the incentive is attenuated in countries with a larger population of informed voters.

III. The empirical analysis

III.A. Data and Model Specification

Our empirical analysis is based on a balanced panel dataset of 23 OECD countries that are observed over the period 1999–2008. The sample coverage in terms of countries and years depends on the data availability about economic literacy and political variables.⁹ We use the following baseline specification:

⁹ The list of our countries is: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

$$BUDGET_{it} = \alpha + \beta \cdot LITERACY_{it-1} + \delta \cdot POLARIZATION_{it-1} + \gamma \cdot (POLARIZATION_{it-1} \cdot LITERACY_{it-1}) + \sum_{j=1}^N \theta_j \cdot CONTROLS_{jit-1} + \omega_i + \tau_t + \varepsilon_{it} \quad (18)$$

Here, i denotes the country, t the year, and j the control variables.

In the most preferred specification, the dependent variable *BUDGET* is the general government primary balance as percentage of GDP. We prefer the primary balance because it does not include the cost for servicing the debt and, henceforth, represents a more direct measure of the whole stance of fiscal policy in the hands of policy-makers. In any case, we also use the overall financial balance over GDP for robustness purposes. Moreover, to control for the sensitivity of fiscal outcomes to the aggregate cycle, we provide robustness checks by using the cyclically-adjusted primary and overall balances as dependent variables. Finally, to detect whether manipulation of voters' beliefs occurs more through the expenditure channel of the budget as opposed to the taxation one, we also run separate regressions for total outlays and total tax and non-tax receipts. In both cases, these variables are computed as percentage of GDP. All dependent variables are sourced from the OECD Economic Outlook database (for more details see Table I).

The variable *LITERACY*, which captures the *scope* for manipulating voters' beliefs, is a survey indicator based on the opinions of experts and business leaders who are annually interviewed by the International Institute for the Management Development (IMD). Participants are asked to evaluate on a 0–10 scale the sentence “Economic literacy among the population is generally high”. Responses are aggregated at country level to provide an overall economic literacy score for the population, and published by the IMD World Competitiveness Yearbook (for more details see also Jappelli 2010). In our sample, this variable exhibits a noticeable degree of variation both cross-country and over time as shown in Figure I. In detail, values range from 3.01 (Spain in 2008) to 8.16 (Finland in 2003 and Iceland in 2004).

We regard this cross-country variation as an additional reason to prefer economic literacy to variables capturing information diffusion. Since our panel is composed of advanced economies only, measures of information diffusion are likely to exhibit a low degree of variation. In Figure II we show the evolution of internet usage and broadband diffusion in each single country over our time span and we note that there are very small differences across countries in both the levels and the growth rates of such variables. Thus, economic literacy does not only allow a better measurement of information asymmetry, due to its focus on the cognitive skills of voters, but it also displays a larger variation with respect to more conventional measures of information diffusion.

[Figures I and II about here]

Previous studies dealing with the determinants and consequences of economic literacy have used more direct methods to elicit the literacy of individuals.¹⁰ However, data collected so far are limited to a few countries and short time periods. The variable used in our study relies on a less direct measurement of literacy but it is methodologically comparable across a large number of OECD countries over a time period of ten years. Not surprisingly, this variable has also been used in other economic studies dealing with the international heterogeneity of literacy (Jappelli 2010).

The variable *POLARIZATION*, which captures the *incentive* for manipulating voters' beliefs, is a dummy that equals one when cabinet components are ideologically homogeneous – regardless of their ideology, that could be right-wing, left-wing or center-oriented. Conversely, the dummy takes value zero when the cabinet composition shows some degree of heterogeneity. More in detail, the dummy is computed from an index which measures the ideological homogeneity of the cabinet along a three-level scale (Schmidt 1992):¹¹ hegemony (level 1), dominance (level 2) and balance (level 3). Within a cabinet, an ideology is hegemonic if all cabinet components adhere to it. An ideology is instead dominant if less than one third of cabinet components do not adhere to it. Otherwise, a cabinet is termed as ideologically balanced. Our dummy *POLARIZATION* takes value one only if an ideology is hegemonic within the cabinet (i.e. level 1), and zero otherwise (i.e. either level 2 or level 3).

Beyond the above manipulation issue, fiscal policy is driven by a set of 'fundamentals'. In our theoretical model, such fundamentals are embedded in preferences and technological constraints as well as in the parameter T. Since these fundamentals change across countries and over time, their impact can be investigated and estimated.

Drawing upon the interpretation of the parameter T, among these fundamentals there are all those variables that affect the sustainability of debt. Indeed, we insert as regressors both the debt-to-GDP ratio (*DEBT*) and the long-term interest rate on the stock of debt (*INTEREST*). On the one hand, both variables should exert a disciplinary impact on fiscal policies – due to fiscal prudence motivations and the scrutiny of international financial markets. On the other hand, a government's may react to a large debt/GDP ratio by stimulating the economy through expansionary fiscal measures (Mauro et al. 2015). This implies that the sign of the estimated coefficient of DEBT can be either positive or negative.

¹⁰ Typically, individuals are asked questions on basic concepts such as inflation, interest compounding and risk diversification (Lusardi 2008).

¹¹ The original index in the Comparative Political Dataset (CPD) is based on a five-level scale. In our sample of 23 advanced economies, we only have three levels.

Away from normal times, the fiscal policy is also required to smooth the economic cycle through automatic mechanisms and discretionary budgetary measures. Hence, to capture the impact of the cycle, we include among regressors the rate of unemployment, the rate of real growth, and the rate of inflation. Unemployment (*UNEMP*) is expressed as a percentage of civilian labor force. Real growth is measured through the annual growth rate of real per capita GDP (*GDP GROWTH*). Inflation (*INFLATION*) is the annual growth rate of the consumer price index.

We also account for other variables that the literature suggests as potential determinants of fiscal policy. First, we include the degree of openness to external trade, which is captured through the sum of imports and exports over GDP (*OPEN*). In principle, the expected sign of trade openness is uncertain. Openness may be positively associated with the budget balance because of the effect of foreign direct investments on government revenues. However, more open economies can also be more prone to fiscal profligacy if they attempt to attract investors through corporate tax benefits.

Second, we include the country population (*POP*) to account for possible country-size effect, especially in the expenditure side of the budget. The expected sign of the coefficient, however, is uncertain. Larger countries may exhibit lower expenditures to GDP ratios if the production of public goods is characterized by scale economies. On the other hand, a large population implies more heterogeneous preferences and the quest for a wider variety of public goods. As a result, the production of public goods may turn out to be less efficient.

Third, the specific cognitive skills that are relevant for electoral behavior might be also captured by a more general measure of voters' education. However, the two notions of economic literacy and education should not be confused and overlapping (Lusardi and Mitchell 2014). More importantly, substantial individual heterogeneity in economic competences remains even for the same level of education. To deal with these issues empirically, we add among regressors the average number of years of education for individuals aged 25 and older (*EDUCATION*), which captures a different aspect of knowledge among individuals.¹² In addition, in the robustness section we run regressions in which *LITERACY* is substituted by *EDUCATION*.

Finally, politicians and bureaucrats may use their discretion to pursue personal gains and extract rents. Thus, we would expect more fiscal profligacy in countries characterized by more corruption and weaker institutions. To this extent, we use an index of perceived corruption in the public sector (*CPI*) – defined as the abuse of public office for private gains. The index quantifies and aggregates perceptions of corruption expressed by a country's population (more precisely: business people, risk analysts and the general public) and it ranges between 0 (pervasive corruption) and 10 (no

¹² As pointed out by Jappelli (2010), OECD-PISA test scores and educational achievements are positively associated with economic literacy across countries as they normally share some common 'deep' determinants. Analogously, in our sample the correlation between *LITERACY* and *EDUCATION* is not negligible (0.61).

corruption) in our sample.¹³ Variables' definitions, their sources and summary statistics are reported in Table I.

All the right-hand-side variables are included at year $t-1$ as the budget balance at time t is normally set up on the basis of the previous year's socio-economic information. More generally, a lag between fiscal outcome and its determinants is likely to occur due to adjustment mechanisms during the policy-making process. Finally, the use of lagged values of explanatory variables allows us to alleviate potential reverse causality issues.

Equation (18) includes country-specific time-invariant effects (ω_i), time effects (τ_t), and the idiosyncratic component (ε_{it}). We estimate our models by means of panel fixed-effects (FE) estimator with heteroscedasticity-robust standard errors.¹⁴

[Table I about here]

III.B. Main Results

Table II shows our empirical results when we use general government primary balance over GDP as dependent variable.

[Table II about here]

In column (1) we only insert the variables related to the incentive and scope for manipulating voters' beliefs (*LITERACY* and *POLARIZATION*) and their interaction. In column (2) we extend the model specification to account for the main fundamentals of fiscal policy (*DEBT* and *INTEREST*). In column (3) we add variables representing the economic cycle (*UNEMP*, *GDP GROWTH* and *INFLATION*). Finally, in the last columns we sequentially add *OPEN* and *POP* (column (4)), *EDUCATION* (column (5)) and *CPI* (column (6)).

¹³ A similar approach is adopted by Shi and Svensson (2006), who use an index measuring each country's "degree of corruption as seen by business people and risk analysts". Moreover, they consider other five institutional indicators designed to provide private investors with measures of governmental rent-seeking activities. As they point out, all these variables "are subjective measures of corruption in general and not specifically a measure of politicians' rents of being in power. However, to the extent that corruption reflects an underlying institutional framework, different forms of corruption are likely to be correlated" (p. 1380). The underlying assumption, in their case, is that such indices capture the incentive to manipulate voters' beliefs. Politicians are expected to manipulate voters more intensively in more corrupt environments, because being in power in these environments affords larger personal gains. While these arguments are very likely in the sample used by Shi and Svensson – that includes advanced and developing countries during 1975-1995, and thus it is widely heterogeneous in terms of quality of institutions across countries over time –, they are less likely in our sample of advanced countries only, where formal and informal institutions are in general very effective in limiting the extraction of personal rents.

¹⁴ The FE estimator is more efficient than the first-differences OLS one (Wooldridge 2002). Moreover, in our data setting, first-differences OLS estimator shows a "too short memory" problem (Laporte and Windmeijer 2005).

Across the different specifications, the estimated coefficients of the variables related to the incentive and scope for manipulating voters are consistent with our theoretical priors. The estimated impact of *POLARIZATION* ranges between -2.51% (significant at 5%) in column (5) and -6.07% (significant at 10%) in column (1). Such marginal impact refers to a situation where *LITERACY* equals zero. However, in our sample such value of *LITERACY* is not observed as its minimum is 3.01. Corresponding to this minimum, the marginal effect of *POLARIZATION* on primary balance is still significantly negative ranging from -1.01% in column (5) to -2.55% in column (1) but with a lower magnitude than before. This suggests that passing from an economically illiterate population to a minimum level of economic literacy contributes to lower the government's scope to manipulate voters. By the same mechanism, for increasing values of *LITERACY*, the overall effect of *POLARIZATION* on primary balance becomes negligible: for sufficiently large values of economic literacy, the term $(\delta + \gamma \cdot literacy)$ is not statistically significant at conventional confidence levels.¹⁵

To sum up, polarized political environments are associated with less fiscal discipline in countries with low levels of economic literacy. Conversely, in countries with high economic literacy, polarization does not affect public finance outcomes. Thus, our evidence is consistent with the view that polarization tends to loosen fiscal policy if and only if there is enough scope for manipulating voters' beliefs.

In the same vein, economic literacy seems to impose fiscal discipline only in countries where the political environment is polarized and, as a consequence, there is some incentive for manipulating voters. More in detail, since *POLARIZATION* is a dummy, β conveys the impact of *LITERACY* under no polarization while $\beta + \gamma$ conveys the same impact under polarization. Results imply that while β is consistently not significant across specifications, the sum $\beta + \gamma$ is statistically positive at conventional significance levels in all regressions. The value ranges from 0.87 in column (3) to 0.90 in column (5).

As to the control variables, estimated coefficients are largely consistent with theoretical priors and quite stable across model specifications. In detail, high public debt-to-GDP ratios provide an incentive to fiscal discipline (Bohn 1998). Likewise, economic growth improves the primary balance over GDP (Lane 2003). This confirms that the fundamental drivers of fiscal policy are at work. Public budgets tend to improve with the intensity of external trade (Corsetti and Müller

¹⁵ For very high values of *LITERACY* (i.e. beyond the 83rd percentile), the sum $(\delta + \gamma \cdot literacy)$ turns out to have a positive statistically significant impact on primary balance over GDP. Nevertheless, regardless the chosen model specification, a very few observations show economic literacy levels that are high enough to change the sign of the overall effect of *POLARIZATION* on *BUDGET*.

2008), while countries with larger populations tend to show a worse fiscal stance. Finally, a lower perceived corruption is associated with tighter fiscal policies (Arin et al. 2011).

In Table III we use the overall financial balance over GDP instead of the primary one as dependent variable. Results are fully in line with those of Table II. This is due to the fact that payments for debt servicing are largely stable within countries in the decade under scrutiny, and thus the cross-country heterogeneity in debt servicing turns out to be part of the fixed effect. In fact, the two balance variables are highly correlated: their pairwise correlation is 0.91 and it is statistically significant at 1%.

[Table III about here]

One concern is that our results may be driven by the correlation between our main explanatory variables and the cyclical component of the primary (and overall) balance. Thus, we replace the observed two balance measures with the cyclically-adjusted counterparts. Results are reported in Tables B.I and B.II in the Appendix B and confirm the main findings of Tables II and III. Hence, we can be confident that our results are not driven by the response of the budget to aggregate economic conditions.

Due to the assumption of perfect complementarity between private and public consumption, in the theoretical model voters' manipulation is conducted with the same intensity along the tax and the expenditure component of the budget. In the real world, however, these two channels may be used with different intensity. To account for this possibility, in Table IV, we split the budget balance into its two components – total outlays, and total tax and non-tax receipts – and run separate regressions based on the most comprehensive model specifications in Table II (the last three columns). In this way, we try to identify the channels through which the incentive and scope for manipulating voters' beliefs materialize. As to total outlays (columns from (1) to (3)), we get no results about *POLARIZATION* and its interaction with *LITERACY*. By contrast, in columns from (4) to (6) we find a negative coefficient on government total revenues of *POLARIZATION* – ranging from -1.44% in column (5) to -1.72% in column (6) – and a positive and statistically significant coefficient of the interaction term between *LITERACY* and *POLARIZATION* in the same specifications. A sort of “smooth effect” of economic literacy in government hegemony would appear passing from totally financially illiterate to partially economic educated people in the case of revenues. For the minimum value of *LITERACY* over the whole sample, the overall effect of *POLARIZATION* on revenue items is still negative, but with a lower magnitude (i.e. -0.45 in column (5) and -0.58 in column (6)).

[Table IV about here]

To sum up, results in Table IV show that political hegemony in the cabinet is not associated with changes in public expenditures whichever the level of voters' economic literacy, but it is negatively associated with tax and non-tax receipts – in countries with low levels of economic literacy. In a nutshell, this suggests that voters are more sensitive to tax reductions than to expenditure expansions. Accordingly, with low levels of economic literacy, polarization is associated to less fiscal discipline on the revenue side rather than on the expenditure side.¹⁶

As to the control variables, high public debt-to-GDP ratios provide an incentive to fiscal discipline in the form of tax and non-tax receipts (Leeper 1991). Likewise, economic growth improves the primary balance over GDP in the form of lower public expenditures. As claimed by Shelton (2007): “Equilibrium country size emerges as a tradeoff between the costs of increasingly heterogeneous preferences and the benefits of sharing non-rivalrous public goods over larger populations”. In our sample, it seems that the first effect prevails and thus country size – measured by *POP* – leads to higher government expenditures. Finally, we find that the average number of years of education positively affects government size in the form of government revenues over GDP. This latter finding is consistent with the evidence shown by Alesina, Baqir, and Easterly (1999).

IV. Robustness checks

IV.A. On the economic literacy

The first robustness check consists in substituting the variable *LITERACY* with *EDUCATION* in equation (18) in order to test whether economic literacy is a mere proxy for general knowledge in determining the scope for manipulation. Results are shown in Table B.III in the Appendix B and they confirm that the two variables capture different aspects of voters' competence and refer to different skills. Indeed, when a general level of individuals' education is used, instead of their financial and economic competences, key results do not hold anymore. Coefficients on *POLARIZATION* and on its interaction with *EDUCATION* are not statistically significant across

¹⁶ This sounds quite familiar to findings by Brender and Drazen (2008) showing that, for voters, the effect of revenue reductions is somewhat larger than the effect of expenditure increases in creating deficits at least in developed countries. Differently from us, Brender and Drazen do not consider voters' heterogeneous ability in processing information.

specifications. More importantly, these results are consistent with the core assumption of our argument: asymmetric information depends on economic knowledge rather than on general knowledge.

The second robustness check we perform deals with the randomization of economic literacy. In this perspective, we apply three falsification tests and randomize the variable *LITERACY* across: i) pooled observations in the dataset; ii) years within countries; and iii) countries within years. As expected, our main results vanish. This seems to exclude that the causality we found is spurious. Results are reported in Table B.IV in the Appendix B.

Finally, we test for potential endogeneity between economic literacy and budgetary policy. One may expect that our results are driven by unknown correlation between our variables of interest (*POLARIZATION* and *LITERACY*) and variables which are omitted in our models and potentially correlated with fiscal balance (Altonji et al. 2005; Chetty et al. 2014a, 2014b). It follows that our results are reliable if and only if one assumption holds: *POLARIZATION* and *LITERACY* are uncorrelated with unobserved determinants of public budgets. As determinants we choose: i) the interaction between country size (i.e. land area in squared kilometers; source: the World Bank – Food and Agriculture Organization) – as proxy of fiscal decentralization (Panizza 1999) – and political stability, that is an overall indicator about perceptions of destabilization or overthrowing of the government in power (source: the World Bank – Governance Indicators); and ii) ethnic fractionalization (Alesina et al. 2003).¹⁷

The first determinant is the interaction between fiscal decentralization and the political stability. Fiscal federalism literature shows that larger countries exhibit a higher degree of fiscal decentralization (Panizza 1999), and this latter leads to less central fiscal discipline (Velasco 2000). Alesina and Tabellini (1990a) show that lower political stability – as proxied by conflicts among different groups of citizens – leads to less fiscal discipline (see also Alesina and Perotti 1995).¹⁸ As to the interaction between fiscal decentralization and the political stability, Huther and Shah (1998) show that there is a positive correlation among them. Thus, we choose to interact them because the extant literature does not prove causation between them, and the two variables may reinforce each other in explaining a country's fiscal discipline.

¹⁷ It reflects probability that two randomly selected people from a given country will not belong to the same ethnolinguistic group. The higher the number, the more fractionalized society. The definition of ethnicity involves a combination of racial and linguistic characteristics. Robustness checks are performed using religion fractionalization reflecting probability that two randomly selected people from a given country will not belong to the same religious group.

¹⁸ To note that in our sample of advanced countries, political stability needs to be interpreted as the rate of conflicts among different groups of citizens, and not in terms of likelihood of destabilization or overthrowing of the government in power.

The second determinant is the ethnic fractionalization. Alesina, Baqir, and Easterly (1999) show that “fiscal discipline is more problematic in ethnically fragmented localities” (p. 1254), and ethnic fractionalization influences the composition of public expenses, i.e. more ethnically fragmented countries show a lower share of public goods spending. We do not interact ethnic fractionalization with country size and/or political instability because – to the best of our knowledge – the extant literature does not show potential direct interactions among them in explaining fiscal discipline (for instance, Easterly and Levine (1997) show that ethnic fractionalization influences a country’s economic performance, which is associated with political stability – but there are no direct interactions between ethnic fractionalization and political stability). To note that reverse causality between a country’s public budget and its determinants (fiscal decentralization, political stability, ethnic fractionalization) is very unlikely (for more details, see Acemoglu, Johnson and Robinson 2005).

We implement the tests developed by Chetty et al. (2014a, 2014b). First, we show the lack of any statistically significant correlation at 1% level between *POLARIZATION* and *LITERACY*, and the predicted value of primary balance based on the above new variables – originally excluded from our baseline models – as reported in Table B.V (part a). More in detail, for each year of our sample we estimated OLS regressions where the dependent variable is the primary budget and the covariates are the above variables, that is the interaction between country’s land area and political stability, and ethnic fractionalization. We find that there is no statistically significant correlation between them. Second, we estimate our main models substituting the dependent variable with its prediction. In this case we find that our main results do not hold, and thus that such results do not seem to be driven by unobserved correlation between fiscal budget and its components. Third, we include the predicted primary balance in our main models, and we find that: i) the excluded variables are strong predictors of the fiscal budget; but ii) our main results hold, and thus the degree of bias in our baseline models is likely to be small. The last two estimates are reported in Table B.V, part b).

IV.B. On government polarization

To check whether our results are driven by confounding factors such as cross-country heterogeneity in either electoral or institutional systems, we provide the following set of robustness checks.

First, we remove presidential democracies (i.e. France, Switzerland, the United States) from our sample. The results (not reported in the paper but available upon request) turn out to be fully in line with the main models. This would suggest that our findings are not affected by parliamentary/presidential regime.

Second, we split our sample between constitutional/parliamentary monarchies and republics.¹⁹ Even though in almost all parliamentary monarchies in our sample the Royal Family has been experiencing a drastic reduction of his powers – e.g. appointment of governments, termination of parliaments –, many parliaments in constitutional monarchies are partially non-voted (e.g. the Chamber of Lords in the UK). This non-voted part of the parliament may interfere with the voted part of the parliament by means of veto rights or other “softer actions”, and thus influence the behavior of the elected party (or party coalition). Hence, after the election, (even) strongly cohesive governments could have less freedom to put forward the policies they announced before the elections. As expected, our main results are confirmed for the republics, whereas they do not remain for the parliamentary monarchies.

Third, we remove majoritarian democracies (i.e. Australia, Canada, France, New Zealand, the United Kingdom, and the United States). Following Persson and Tabellini (1999), one might theoretically expect that majoritarian as opposed to proportional elections increase competition between parties/party coalitions in certain “marginal” electoral districts, leading to a more targeted wealth redistribution and, at the end, larger governments. Estimations (not reported in the paper but available upon request) without countries with majoritarian electoral rules continue to hold. Thus, our main findings do not seem to be driven by the electoral system.

Finally, in the contributions close to ours, the incentive to win the election is ascribed to the ability of politicians to extract rents once in office. Accordingly, this incentive is captured by some indexes of perceived corruption. The rationale is that perceived corruption measures how much public officials can exploit their position for private benefits (Shi and Svensson 2006). Hence, perceived corruption might play the same role of polarization as a determinant of the *incentive* to manipulate voters. For this reason, we estimate Eq. (18) by replacing *POLARIZATION* with the *CPI* index. Results are not reported but are available upon request, and confirm that the two variables address different issues. Coefficients of *CPI* and its interaction with *LITERACY* are not statistically significant at the conventional level across different specifications.

V. Additional evidence

¹⁹ Among monarchies we have: Australia, Belgium, Canada, Denmark, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Spain, Sweden and the United Kingdom. The rest of the countries in the sample are coded as republics. The results are not reported in the paper but are available upon request.

V.A. The role of ideology in government polarization

For many years the question of whether government ideology influences economic policy-making has been debated and many empirical contributions have demonstrated that government ideology influences somehow public policies as political parties should gratify the needs of their constituencies (Schmidt 1996 and Potrafke 2016 for a fresh survey on empirical works on OECD countries). More importantly for us, political parties normally exhibit diverging fiscal platforms, which are more diverse when political polarization increases (e.g., in the United States between the Democrats and the Republicans; in the United Kingdom between the Labor and the Tories).

Empirical evidence is, however, not conclusive on the fiscal effect of government ideology for OECD countries and results are mixed. For instance, leftwing governments do not seem to always increase public debt and budget deficits (Alesina et al. 1999) and, when it is the case, such effect would depend on adverse economic conditions (e.g., Cusack 1999).²⁰

To test whether political parties do matter in our framework, we provide additional results by estimating equation (18), wherein we replace the dummy *POLARIZATION* with three different dummy accounting for political ideology among cohesive governments. In detail, the new variable *PARTY POLARIZATION* can assume three “colours” (marked by $k = 1, 2, 3$) depending on which is the political party having the hegemony in the cabinet, i.e. right-wing, center-wing or left-wing governments.²¹

$$\begin{aligned} BUDGET_{it} = & \alpha + \beta \cdot LITERACY_{it-1} + \sum_{k=1}^3 \delta_k \cdot PARTY\ POLARIZATION_{kit-1} + \\ & \sum_{k=1}^3 \gamma_k \cdot (PARTY\ POLARIZATION_{kit-1} \cdot LITERACY_{it-1}) + \sum_{j=1}^N \theta_j \cdot CONTROL_{jit-1} + \\ & \omega_i + \tau_t + \varepsilon_{it} + \end{aligned} \quad (19)$$

In detail, “Left” denotes social democratic parties and political parties to the left of social democrats; “Right” denotes liberal and conservative parties; “Center” denotes center parties (in

²⁰ More recently Raess and Pontusson (2015) and Müller, Storesletten and Zilibotti (2016) have investigated whether government ideology influences fiscal policies in OECD countries during the financial crisis starting in 2007. The former find that government ideology hardly influence any of the fiscal stimulus packages in the 2008-2009 recession. The latter conclude that, during the financial crisis, government ideology did not help to predict budget deficits.

²¹ The three dummies can be included together in the regressions as they are mutually exclusive, being possible only totally right-, or totally center- or totally left-wing hegemony.

particular Christian Democratic or Catholic parties).²² The rest of the RHS variables is unchanged as well as the estimation methodology.

Results are provided considering the primary balance and the overall financial balance as dependent variables and reported, respectively, in Tables V and VI. In both cases, the baseline findings hold only in the case of right-hegemony (*RIGHT POLARIZATION*) and its interaction with the level of economic literacy. On the other hand, no statistically significant coefficients emerge for hegemony of either left- or center-wing government party.

[Tables V & VI about here]

These results are consistent with previous contributions (e.g., Alesina and Tabellini 1990b; Persson and Svensson 1989; Alt and Lassen 2006) stating that right-wing governments, at least for strategic reasons - i.e. to reduce the possibilities for spending should a successor government be left-wing -, tend to have higher deficits than left-wing governments. This should be due to the more likely manipulation of voters put forward by right-wing governments. Another explanation provided by some authors (Song, Kijetil and Zilibotti 2012; Alesina and Passalacqua 2015) is that when right-wing parties are in power, they are less concerned with the provision of public goods in the future but they are more likely to push up current debt today in order to use the resources as subsidies for private consumption.²³

VI. Conclusions

After decades of research, economists now take for granted that the pursuit of political objectives lead to public deficits and debts that are somehow excessive with respect to the levels dictated by economic rationality. However, the mechanisms through which this political influence unfolds represent an issue still under scrutiny. Mechanisms advocated in early studies were based on a deviation from full rationality. According to these studies, voters fail to understand that large current deficits induce a temporary demand expansion at the cost of a future demand contraction (Buchanan and Wagner 1977). As a consequence, politicians tend to behave strategically by indulging in large deficits and by being reluctant to impose plans of fiscal consolidation.

²² According to Schmidt (1996: 160), center parties favor a “moderate social amelioration in a location to the left of conservative or conservative-neoliberal parties.”

²³ In particular, right-wing governments run larger deficits and accumulate more debt because increasing debt today can finance a current tax break at the cost of crowding out future public good provision. Such a cost is of little importance to right-wing voters.

In contrast with these early contributions, more recent studies have devised a set of mechanisms fully consistent with voters rationality. According to them, politicians use their budget discretion strategically to tie the hands of possibly adverse future cabinets (Alesina and Tabellini 1990a), to manipulate the beliefs of imperfectly informed voters (Rogoff 1990) and to redistribute resources across constituencies (Battaglini and Coate 2008) or generations (Song, Kijetil and Zilibotti 2012).

This paper is inspired by such modern literature borrowing two key ideas from it. First, in line with Rogoff (1990) we assume that voters are imperfectly informed on the ability of politicians, so that the latter try to manipulate citizens' beliefs to gain consensus. Second, close in spirit with Alesina and Tabellini (1990a), we hold that consensus is more valuable if political competitors are ideologically more distant. Accordingly, we assume that the incentive to manipulate voters increases with the ideological polarization of cabinets.

The distinctive contribution of the paper relates to what lies at the hearth of voters' imperfect information. In this respect, we argue that voters are able to make an informed judgement on the ability of politicians only if they possess an adequate economic knowledge. Therefore, we assume that imperfect information depends on the extent of voters' economic competence. Ludwig von Mises (1949) would probably agree: "All present-day political issues concern problems commonly called economic. In joining a political party and in casting his ballot, the citizen implicitly takes a stand upon essential economic theories" (chapter 38).

By means of a formal model built on these assumptions, we predict that the actual fiscal balance exhibits a downward bias with respect to the balance resulting from economic fundamentals. In addition, we predict that this bias depends on the interaction between cabinet polarization and the level of economic knowledge among voters. For given economic knowledge, the balance is expected to worsen with polarization. In addition, this relationship is expected to become weaker as economic knowledge becomes more diffuse.

In the second part of the paper, we test these predictions by exploiting time and cross-country variability of key variables. By using standard estimation methods and a wide set of robustness checks, we document that the above theoretical predictions are consistent with the evidence exhibited by a large sample of advanced economies observed along the first decade of the new century.

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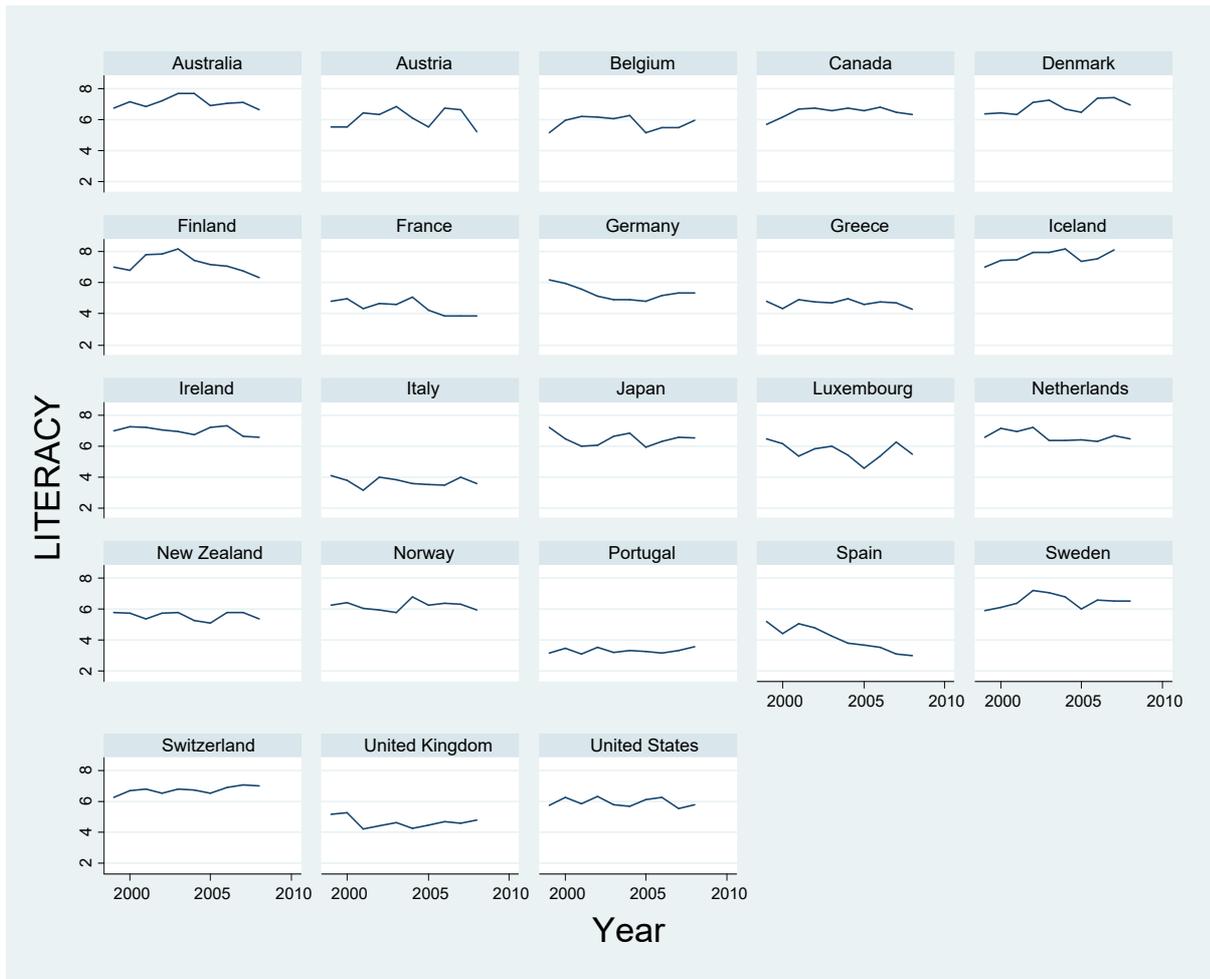
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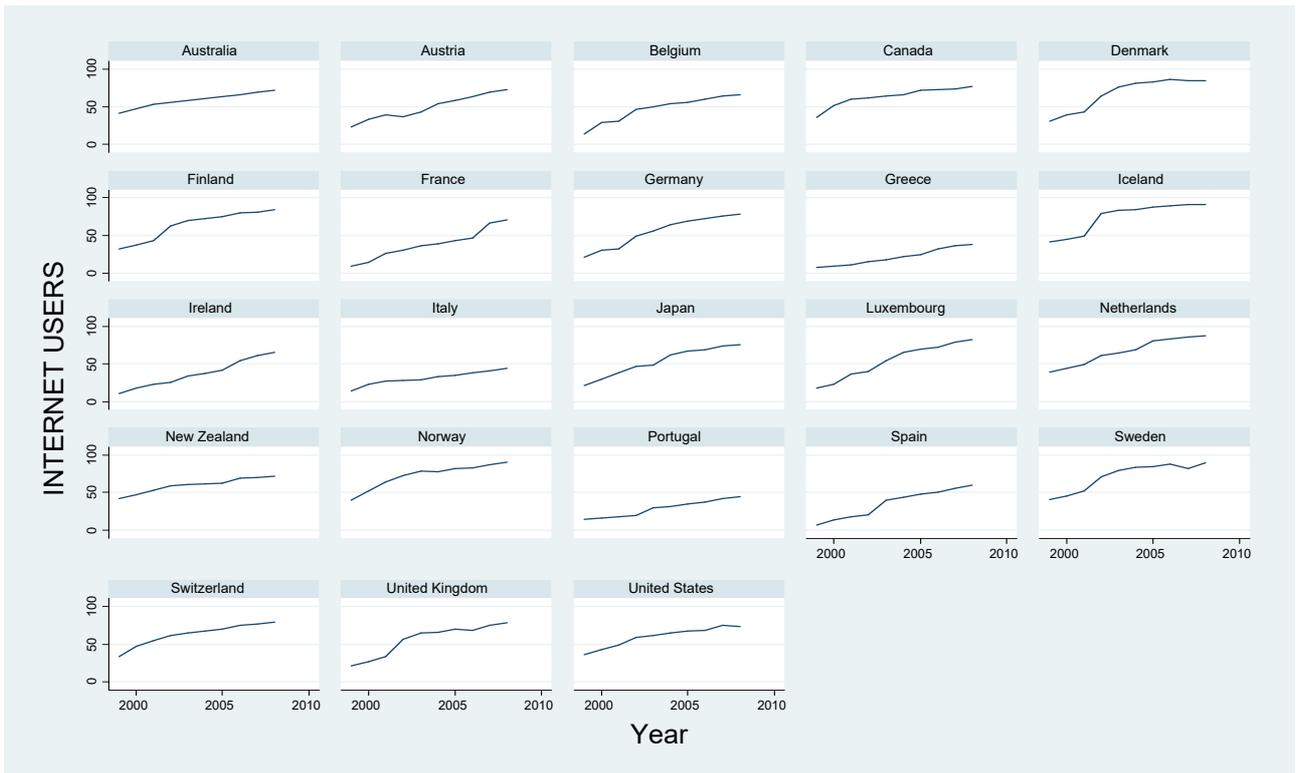
Figures

Figure I – *Economic literacy by country (average values, 1999–2008)*.

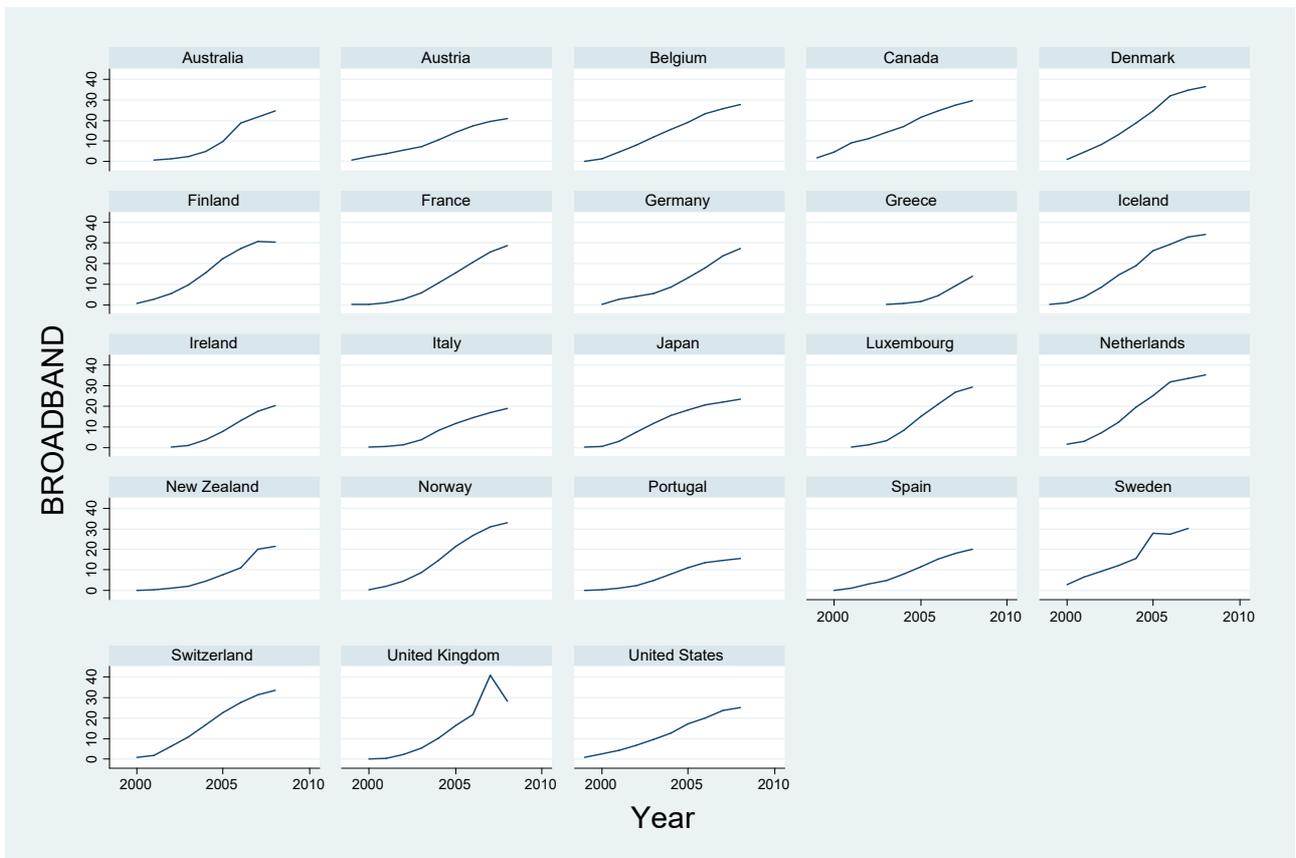


Notes: Authors' elaboration on World Competitiveness Yearbook.

Figure II – *Internet users and broadband subscribers by country (average values, 1999–2008).*



Notes: Authors' elaboration on World Development Indicators (Source: World Bank).



Notes: Authors' elaboration on World Development Indicators (Source: World Bank).

Tables

Table I – Variables' definition and descriptive statistics

Variables	Definition	Source	Mean	Std. Dev.	Min	Max
PRIMARY BALANCE	Government primary balance (excluding net interest payments), % GDP.	OECD Economic Outlook	1.673	3.672	-13.528	16.102
OVERALL FINANCIAL BALANCE	Government financial balance, % GDP.	OECD Economic Outlook	-0.039	4.379	-13.507	18.787
TOTAL OUTLAYS	Government total outlays, % GDP.	OECD Economic Outlook	43.644	6.521	31.219	58.112
TOTAL TAX & NO-TAX RECEIPTS	Government total tax and non-tax receipts, % GDP.	OECD Economic Outlook	43.606	7.399	30.121	58.898
LITERACY	Economic literacy. Survey indicator (on a 0-10 scale) based on the opinions of experts and business insiders being interviewed on the sentence "Economic literacy among the population is generally high".	World Competitiveness Yearbook	5.820	1.227	3.010	8.160
POLARIZATION	Dummy equal to 1 if hegemony in the cabinet composition	Own elaborations on Comparative Political Dataset	0.661	0.474	0.000	1.000
DEBT	Gross government debt (financial liabilities), % GDP.	OECD Economic Outlook	65.272	33.032	11.280	171.128
INTEREST	Long-term interest rate on government bonds.	OECD Economic Outlook	4.651	1.435	1.003	11.195
UNEMP	Unemployment rate as a percentage of civilian labour force.	OECD Employment and Labour Market Statistics	5.964	2.493	2.007	15.692
GDP GROWTH	Annual percentage growth rate of GDP per capita based on constant local currency.	OECD Main Economic Indicators	1.971	1.760	-4.507	9.484
INFLATION	Growth of consumer price index (CPI), all items, percent change from previous year.	OECD Main Economic Indicators	2.359	1.403	-0.900	12.655
OPEN	Total trade (sum of import and export), % GDP, in current prices.	Penn World Table 8.0	85.576	54.435	18.756	319.554
POP	Total population (millions)	OECD Employment and Labour Market Statistics	37.842	62.650	0.277	304.094
EDUCATION	Average number of years of education of women and men aged 25 and older.	Gakidou et al. (2010)	22.518	3.269	12.500	28.200
CPI	Corruption perception index. Score relates to perceptions of the degree of corruption seen by business people, risk analysts and the general public (0= highly corrupt; 10= highly clean).	Transparency International Organization	7.943	1.403	4.200	10.000
CYCLICALLY-ADJUSTED PRIMARY BALANCE	Cyclically adjusted government primary balance (excluding net interest payments), % potential GDP.	OECD Economic Outlook	0.388	2.994	-17.532	7.899
CYCLICALLY-ADJUSTED OVERALL BALANCE	Cyclically-adjusted government financial balance, % potential GDP.	OECD Economic Outlook	-1.309	3.149	-16.318	6.261
RIGHT POLARIZATION	Dummy equal to 1 if right hegemony in the cabinet composition	Own elaborations on Comparative Political Dataset	0.296	0.457	0.000	1.000
CENTER POLARIZATION	Dummy equal to 1 if center hegemony in the cabinet composition	Own elaborations on Comparative Political Dataset	0.100	0.301	0.000	1.000
LEFT POLARIZATION	Dummy equal to 1 if left hegemony in the cabinet composition	Own elaborations on Comparative Political Dataset	0.217	0.413	0.000	1.000

Notes: Summary statistics are provided on a yearly base for the whole sample.

Table II – Primary balance, government polarization and economic literacy

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dep. Var.: PRIMARY BALANCE (% GDP)</i>					
<i>LITERACY</i> _{<i>t</i>-1}	-0.29 (0.71)	-0.20 (0.68)	-0.26 (0.71)	-0.24 (0.71)	0.40 (0.53)	0.38 (0.50)
<i>POLARIZATION</i> _{<i>t</i>-1}	-6.07* (3.23)	-5.85* (2.96)	-5.60* (2.84)	-5.35* (2.78)	-2.51** (1.17)	-3.12** (1.19)
<i>(POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	1.17* (0.65)	1.16* (0.60)	1.13* (0.58)	1.08* (0.57)	0.49** (0.23)	0.60** (0.24)
<i>DEBT</i> _{<i>t</i>-1}		0.068* (0.036)	0.061 (0.037)	0.071* (0.036)	0.071* (0.040)	0.070 (0.041)
<i>INTEREST</i> _{<i>t</i>-1}		-0.099 (0.66)	-0.21 (0.81)	-0.22 (0.79)	0.29 (1.14)	0.14 (1.09)
<i>UNEMP</i> _{<i>t</i>-1}			-0.18 (0.28)	-0.30 (0.27)	-0.22 (0.28)	-0.26 (0.27)
<i>GDP GROWTH</i> _{<i>t</i>-1}			0.60*** (0.16)	0.50** (0.19)	0.38** (0.16)	0.35** (0.15)
<i>INFLATION</i> _{<i>t</i>-1}			-0.025 (0.30)	-0.097 (0.34)	-0.16 (0.39)	-0.18 (0.37)
<i>OPEN</i> _{<i>t</i>-1}				0.049** (0.018)	0.051** (0.020)	0.052*** (0.017)
<i>POP</i> _{<i>t</i>-1}				-0.17** (0.071)	-0.15* (0.087)	-0.13 (0.084)
<i>EDUCATION</i> _{<i>t</i>-1}					0.78 (1.13)	0.77 (1.09)
<i>CPI</i> _{<i>t</i>-1}						0.97* (0.52)
Observations	207	207	207	207	198	198
R-squared	0.331	0.366	0.433	0.460	0.476	0.492
Number of countries	23	23	23	23	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland (columns 5 and 6). **p* < 0.10; ***p* < 0.05; ****p* < 0.01.

Table III – Overall financial balance, government polarization and economic literacy

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dep. Var.: OVERALL FINANCIAL BALANCE (% GDP)</i>					
<i>LITERACY</i> _{<i>t</i>-1}	-0.13 (0.71)	-0.064 (0.71)	-0.12 (0.72)	-0.13 (0.72)	0.52 (0.54)	0.49 (0.51)
<i>POLARIZATION</i> _{<i>t</i>-1}	-5.48* (3.12)	-5.31* (2.95)	-5.15* (2.84)	-4.93* (2.77)	-2.16* (1.21)	-2.78** (1.26)
<i>(POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	1.08* (0.63)	1.07* (0.60)	1.05* (0.58)	1.02* (0.57)	0.44* (0.24)	0.55** (0.25)
<i>DEBT</i> _{<i>t</i>-1}		0.044 (0.041)	0.040 (0.040)	0.050 (0.038)	0.050 (0.043)	0.049 (0.042)
<i>INTEREST</i> _{<i>t</i>-1}		-0.12 (0.67)	-0.28 (0.78)	-0.30 (0.76)	0.079 (1.15)	-0.082 (1.10)
<i>UNEMP</i> _{<i>t</i>-1}			-0.29 (0.26)	-0.39 (0.27)	-0.32 (0.28)	-0.37 (0.28)
<i>GDP GROWTH</i> _{<i>t</i>-1}			0.65*** (0.14)	0.56*** (0.17)	0.46*** (0.16)	0.43*** (0.15)
<i>INFLATION</i> _{<i>t</i>-1}			-0.00016 (0.30)	-0.053 (0.33)	-0.13 (0.38)	-0.16 (0.36)
<i>OPEN</i> _{<i>t</i>-1}				0.041** (0.017)	0.043** (0.020)	0.044** (0.018)
<i>POP</i> _{<i>t</i>-1}				-0.21*** (0.071)	-0.19** (0.088)	-0.16* (0.084)
<i>EDUCATION</i> _{<i>t</i>-1}					0.69 (1.07)	0.68 (1.03)
<i>CPI</i> _{<i>t</i>-1}						1.00** (0.47)
Observations	207	207	207	207	198	198
R-squared	0.299	0.314	0.403	0.433	0.434	0.453
Number of countries	23	23	23	23	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland (columns 5 and 6). **p* < 0.10; ***p* < 0.05; ****p* < 0.01.

Table IV – Total outlays, tax and non-tax receipts, government polarization and economic literacy

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	TOTAL OUTLAYS (% GDP)			TOTAL TAX & NON-TAX RECEIPTS (% GDP)		
<i>LITERACY</i> _{<i>t</i>-1}	0.053 (0.76)	-0.44 (0.46)	-0.43 (0.46)	-0.072 (0.29)	0.077 (0.28)	0.065 (0.25)
<i>POLARIZATION</i> _{<i>t</i>-1}	3.71 (3.05)	0.72 (1.08)	1.06 (1.12)	-1.22 (0.77)	-1.44* (0.76)	-1.72** (0.63)
<i>(POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	-0.74 (0.61)	-0.11 (0.21)	-0.17 (0.22)	0.27* (0.14)	0.33** (0.15)	0.38*** (0.13)
<i>DEBT</i> _{<i>t</i>-1}	-0.023 (0.036)	-0.011 (0.037)	-0.010 (0.037)	0.027 (0.022)	0.039*** (0.013)	0.039*** (0.012)
<i>INTEREST</i> _{<i>t</i>-1}	1.02* (0.56)	1.51* (0.79)	1.60** (0.76)	0.72 (0.57)	1.59*** (0.48)	1.52*** (0.47)
<i>UNEMP</i> _{<i>t</i>-1}	0.23 (0.20)	0.25 (0.22)	0.28 (0.22)	-0.16 (0.16)	-0.071 (0.11)	-0.092 (0.11)
<i>GDP GROWTH</i> _{<i>t</i>-1}	-0.43*** (0.12)	-0.42*** (0.14)	-0.40*** (0.13)	0.13 (0.17)	0.040 (0.11)	0.028 (0.11)
<i>INFLATION</i> _{<i>t</i>-1}	0.046 (0.25)	0.11 (0.30)	0.12 (0.29)	-0.0071 (0.20)	-0.023 (0.19)	-0.036 (0.19)
<i>OPEN</i> _{<i>t</i>-1}	-0.088*** (0.026)	-0.084** (0.031)	-0.084*** (0.030)	-0.047** (0.022)	-0.041** (0.018)	-0.041** (0.019)
<i>POP</i> _{<i>t</i>-1}	0.11* (0.062)	0.20** (0.092)	0.18* (0.095)	-0.092** (0.035)	0.012 (0.042)	0.024 (0.041)
<i>EDUCATION</i> _{<i>t</i>-1}		1.87 (1.25)	1.87 (1.25)		2.56*** (0.78)	2.56*** (0.76)
<i>CPI</i> _{<i>t</i>-1}			-0.54 (0.45)			0.46 (0.32)
Observations	207	198	198	207	198	198
R-squared	0.397	0.444	0.451	0.285	0.449	0.460
Number of countries	23	22	22	23	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The dependent variable is: total outlays over GDP for columns from (1) to (3); total tax and non-tax receipts over GDP for columns from (4) to (6). The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland (columns 2, 3 5 and 6). * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table V – Primary balance, partisan government polarization and economic literacy

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dep. Var.: PRIMARY BALANCE (% GDP)</i>					
<i>LITERACY</i> _{<i>t</i>-1}	-0.15 (0.69)	-0.055 (0.69)	-0.058 (0.65)	-0.073 (0.67)	0.49 (0.60)	0.47 (0.57)
<i>RIGHT POLARIZATION</i> _{<i>t</i>-1}	-7.43** (2.95)	-8.27** (3.31)	-7.15** (3.21)	-6.96** (3.11)	-3.78** (1.49)	-4.54*** (1.60)
<i>(RIGHT POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	1.35** (0.60)	1.55** (0.66)	1.34** (0.62)	1.32** (0.61)	0.64* (0.32)	0.78** (0.32)
<i>LEFT POLARIZATION</i> _{<i>t</i>-1}	-2.15 (2.35)	-1.40 (2.59)	-1.88 (2.79)	-2.28 (2.85)	-0.65 (2.67)	-1.03 (2.67)
<i>(LEFT POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	0.39 (0.50)	0.34 (0.57)	0.40 (0.62)	0.51 (0.64)	0.18 (0.60)	0.24 (0.61)
<i>CENTER POLARIZATION</i> _{<i>t</i>-1}	0.95 (3.29)	-1.41 (3.65)	-1.63 (3.54)	-3.11 (3.51)	-1.45 (3.18)	-2.14 (3.27)
<i>(CENTER POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	-0.075 (0.61)	0.35 (0.68)	0.40 (0.66)	0.53 (0.67)	0.20 (0.57)	0.31 (0.61)
<i>DEBT</i> _{<i>t</i>-1}		0.091** (0.034)	0.084** (0.035)	0.095*** (0.031)	0.080** (0.035)	0.080** (0.036)
<i>INTEREST</i> _{<i>t</i>-1}		-0.21 (0.70)	-0.28 (0.83)	-0.23 (0.82)	0.27 (1.20)	0.11 (1.15)
<i>UNEMP</i> _{<i>t</i>-1}			-0.23 (0.29)	-0.31 (0.27)	-0.21 (0.27)	-0.25 (0.27)
<i>GDP GROWTH</i> _{<i>t</i>-1}			0.43*** (0.14)	0.32* (0.17)	0.31 (0.20)	0.28 (0.19)
<i>INFLATION</i> _{<i>t</i>-1}			-0.088 (0.30)	-0.16 (0.33)	-0.16 (0.39)	-0.18 (0.37)
<i>OPEN</i> _{<i>t</i>-1}				0.054** (0.021)	0.052** (0.024)	0.052** (0.020)
<i>POP</i> _{<i>t</i>-1}				-0.22*** (0.056)	-0.19** (0.090)	-0.17* (0.086)
<i>EDUCATION</i> _{<i>t</i>-1}					0.43 (1.33)	0.38 (1.27)
<i>CPI</i> _{<i>t</i>-1}						1.04* (0.53)
Observations	207	207	207	207	198	198
R-squared	0.344	0.400	0.437	0.470	0.485	0.504
Number of countries	23	23	23	23	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland (columns 5 and 6). * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table VI – Overall financial balance, partisan government polarization and economic literacy

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dep. Var.: OVERALL FINANCIAL BALANCE (% GDP)</i>					
<i>LITERACY</i> _{<i>t</i>-1}	0.0068 (0.71)	0.077 (0.72)	0.081 (0.66)	0.051 (0.68)	0.60 (0.61)	0.57 (0.59)
<i>RIGHT POLARIZATION</i> _{<i>t</i>-1}	-7.14** (3.03)	-7.74** (3.37)	-6.61* (3.24)	-6.41** (3.09)	-3.38** (1.58)	-4.17** (1.75)
<i>(RIGHT POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	1.33** (0.60)	1.46** (0.66)	1.25* (0.61)	1.24** (0.59)	0.59* (0.33)	0.73** (0.35)
<i>LEFT POLARIZATION</i> _{<i>t</i>-1}	-1.53 (2.43)	-0.99 (2.65)	-1.55 (2.88)	-1.91 (2.92)	-0.32 (2.74)	-0.71 (2.75)
<i>(LEFT POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	0.30 (0.51)	0.27 (0.57)	0.33 (0.63)	0.44 (0.65)	0.12 (0.61)	0.19 (0.62)
<i>CENTER POLARIZATION</i> _{<i>t</i>-1}	0.22 (3.26)	-1.46 (3.59)	-1.45 (3.47)	-3.29 (3.48)	-1.81 (3.37)	-2.53 (3.47)
<i>(CENTER POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	0.029 (0.59)	0.34 (0.65)	0.35 (0.63)	0.53 (0.66)	0.24 (0.60)	0.35 (0.64)
<i>DEBT</i> _{<i>t</i>-1}		0.066 (0.040)	0.061 (0.039)	0.074** (0.034)	0.060 (0.038)	0.059 (0.037)
<i>INTEREST</i> _{<i>t</i>-1}		-0.20 (0.72)	-0.33 (0.82)	-0.28 (0.81)	0.089 (1.26)	-0.079 (1.21)
<i>UNEMP</i> _{<i>t</i>-1}			-0.33 (0.28)	-0.40 (0.27)	-0.31 (0.28)	-0.35 (0.27)
<i>GDP GROWTH</i> _{<i>t</i>-1}			0.48*** (0.13)	0.39** (0.16)	0.39* (0.20)	0.35* (0.19)
<i>INFLATION</i> _{<i>t</i>-1}			-0.067 (0.29)	-0.12 (0.32)	-0.13 (0.39)	-0.16 (0.37)
<i>OPEN</i> _{<i>t</i>-1}				0.045** (0.021)	0.044* (0.025)	0.044** (0.021)
<i>POP</i> _{<i>t</i>-1}				-0.26*** (0.054)	-0.24** (0.091)	-0.22** (0.086)
<i>EDUCATION</i> _{<i>t</i>-1}					0.22 (1.30)	0.17 (1.23)
<i>CPI</i> _{<i>t</i>-1}						1.08** (0.46)
Observations	207	207	207	207	198	198
R-squared	0.318	0.350	0.405	0.444	0.444	0.466
Number of countries	23	23	23	23	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland (columns 5 and 6). **p* < 0.10; ***p* < 0.05; ****p* < 0.01.

Appendix A

In this appendix we solve problem (9) and derive equations (12) and (13).

Lemma

The consumption of private goods is a γ -fraction of the consumption of public goods:

$$c_j = \gamma g_j \quad (A1)$$

Proof

By contradiction. Use (11) in program (9) and compute the f.o.cs for t_j and g_j :

$$\frac{1 + \gamma \frac{d \min[c_j, \gamma g_j]}{dt_j}}{\gamma} \left(1 + \frac{\rho}{\bar{z}}\right) + [T - t_j + g_j - \eta_j] \left(1 + \frac{\rho}{\bar{z}} + \rho \frac{1 - \sigma}{\bar{z}} \frac{\mu}{\beta_t}\right) = 0 \quad (A2)$$

$$\frac{1 + \gamma \frac{d \min[c_j, \gamma g_j]}{dg_j}}{\gamma} \left(1 + \frac{\rho}{\bar{z}}\right) - [T - t_j + g_j - \eta_j] \left(1 + \frac{\rho}{\bar{z}} - \rho \frac{1 - \sigma}{\bar{z}} \frac{1 - \mu}{\beta_g}\right) = 0 \quad (A3)$$

We now show that if we start by assuming that $c_j > \gamma g_j$ we end up with the contradictory conclusion that $c_j < \gamma g_j$. In fact, if $c_j > \gamma g_j$, the derivative $d \min[c_j, \gamma g_j]/dt_j$ is nil and, due to (A2), it holds $T - t_j + g_j - \eta_j = 0$. However, because of (A3), the latter implies that the derivative $d \min[c_j, \gamma g_j]/dg_j$ is also nil, i.e. that $c_j < \gamma g_j$.

Analogously, if we start by assuming $c_j < \gamma g_j$ we end up with the contradictory conclusion that $c_j > \gamma g_j$. This proves the lemma.

Solution

Equation (A1) allows us to restate program (9) only in terms of the control variable t_j :

$$V(c_j, g_j, s_j) = \frac{1 + \gamma}{\gamma} \cdot (y - t_j) - \frac{1}{2} [T - s_j]^2 \quad (A4)$$

$$s_j = t_j - g_j + \eta_j = -\frac{y}{\gamma} + \frac{1 + \gamma}{\gamma} t_j + \eta_j \quad (A5)$$

$$E(\eta_j | t_j, g_j) \equiv \mu \frac{t_j - \alpha_t}{\beta_t} + (1 - \mu) \frac{g_j - \alpha_g}{\beta_g} = \frac{t_j - \alpha_t}{\beta_t} \equiv E(\eta_j | t_j) \quad (A6)$$

Notice that equation (A6) suggests that μ is immaterial for the solution. The reason is that (A1) and the conjectured policy - equations (10) in the main text – imply the following restriction as for the unknown coefficients:

$$\alpha_g = \frac{1}{\gamma}y - \frac{1}{\gamma}\alpha_t \quad \beta_g = -\frac{1}{\gamma}\beta_t \quad (A7)$$

Use (A4)-(A6) in program (9) and compute the f.o.c. with respect to t_j :

$$\left[-1 + \left(T + \frac{y}{\gamma} - \frac{1+\gamma}{\gamma}t_j - \eta_j\right)\right] \frac{1+\gamma}{\gamma} \left(1 + \frac{\rho}{\bar{z}}\right) + \rho \frac{1-\sigma}{\bar{z}} \left(T + \frac{y}{\gamma} - \frac{1+\gamma}{\gamma}t_j - \eta_j\right) \frac{1}{\beta_t} = 0 \quad (A8)$$

Notice that this expression requires $-\frac{1+\gamma}{\gamma}t_j - \eta_j$ to be independent from η_j . For this to be the case, it must hold

$$\beta_t = -\frac{\gamma}{1+\gamma} \quad (A9)$$

Substitute (A9) in (A8) and solve with respect to t_j :

$$t_j = \frac{\gamma}{1+\gamma} \left(T - 1 + \frac{y}{\gamma} - \eta_j\right) - \frac{\gamma}{1+\gamma} \frac{\rho(1-\sigma)}{\bar{z} + \sigma\rho} \quad (A10)$$

Finally, substitute (A10) in (A1) and solve for g_j :

$$g_j = \frac{1}{1+\gamma} (-T + 1 + y + \eta_j) + \frac{1}{1+\gamma} \frac{\rho(1-\sigma)}{\bar{z} + \sigma\rho} \quad (A11)$$

Equations (A10) and (A11) correspond to equations (12) and (13) in the main text.

Appendix B

Table B.I – *Cyclically-adjusted primary balance, government polarization and economic literacy*

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dep. Var.: CYCLICALLY-ADJUSTED PRIMARY BALANCE (% potential GDP)</i>					
<i>LITERACY</i> _{<i>t</i>-1}	-0.68 (0.76)	-0.63 (0.68)	-0.70 (0.73)	-0.68 (0.73)	0.10 (0.47)	0.080 (0.43)
<i>POLARIZATION</i> _{<i>t</i>-1}	-6.86* (3.44)	-6.86** (3.14)	-6.48* (3.18)	-6.28* (3.12)	-2.91*** (0.92)	-3.46*** (0.98)
<i>(POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	1.36* (0.70)	1.38** (0.64)	1.32* (0.66)	1.28* (0.65)	0.58*** (0.19)	0.68*** (0.20)
<i>DEBT</i> _{<i>t</i>-1}		0.055* (0.028)	0.043 (0.032)	0.049 (0.032)	0.036 (0.033)	0.035 (0.035)
<i>INTEREST</i> _{<i>t</i>-1}		0.23 (0.65)	0.31 (0.81)	0.29 (0.79)	1.26 (0.85)	1.12 (0.80)
<i>UNEMP</i> _{<i>t</i>-1}			0.096 (0.31)	0.0026 (0.31)	0.17 (0.27)	0.13 (0.27)
<i>GDP GROWTH</i> _{<i>t</i>-1}			0.33** (0.14)	0.25 (0.17)	0.18 (0.14)	0.16 (0.13)
<i>INFLATION</i> _{<i>t</i>-1}			-0.13 (0.27)	-0.19 (0.29)	-0.20 (0.35)	-0.23 (0.33)
<i>OPEN</i> _{<i>t</i>-1}				0.040* (0.021)	0.036 (0.022)	0.036* (0.019)
<i>POP</i> _{<i>t</i>-1}				-0.10 (0.089)	-0.075 (0.10)	-0.051 (0.10)
<i>EDUCATION</i> _{<i>t</i>-1}					1.21 (1.41)	1.20 (1.39)
<i>CPI</i> _{<i>t</i>-1}						0.90* (0.51)
Observations	207	207	207	207	198	198
R-squared	0.346	0.372	0.398	0.414	0.432	0.448
Number of countries	23	23	23	23	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland (columns 5 and 6). **p* < 0.10; ***p* < 0.05; ****p* < 0.01.

Table B.II – *Cyclically-adjusted overall balance, government polarization and economic literacy*

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dep. Var.: CYCLICALLY-ADJUSTED OVERALL BALANCE (% potential GDP)</i>					
<i>LITERACY</i> _{<i>t</i>-1}	-0.53 (0.69)	-0.51 (0.66)	-0.57 (0.70)	-0.56 (0.70)	0.17 (0.46)	0.15 (0.43)
<i>POLARIZATION</i> _{<i>t</i>-1}	-6.14* (3.14)	-6.20** (2.98)	-5.90* (3.00)	-5.74* (2.95)	-2.63** (0.96)	-3.22*** (1.05)
<i>(POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	1.24* (0.64)	1.25* (0.61)	1.21* (0.61)	1.18* (0.61)	0.54** (0.20)	0.64*** (0.22)
<i>DEBT</i> _{<i>t</i>-1}		0.027 (0.030)	0.018 (0.032)	0.024 (0.033)	0.015 (0.034)	0.013 (0.034)
<i>INTEREST</i> _{<i>t</i>-1}		0.21 (0.59)	0.22 (0.73)	0.21 (0.71)	0.99 (0.83)	0.84 (0.78)
<i>UNEMP</i> _{<i>t</i>-1}			-0.0041 (0.29)	-0.085 (0.29)	0.058 (0.27)	0.015 (0.26)
<i>GDP GROWTH</i> _{<i>t</i>-1}			0.38*** (0.13)	0.31* (0.16)	0.24* (0.14)	0.22* (0.13)
<i>INFLATION</i> _{<i>t</i>-1}			-0.084 (0.27)	-0.13 (0.29)	-0.16 (0.35)	-0.19 (0.33)
<i>OPEN</i> _{<i>t</i>-1}				0.032 (0.021)	0.029 (0.023)	0.030 (0.021)
<i>POP</i> _{<i>t</i>-1}				-0.13 (0.086)	-0.10 (0.10)	-0.076 (0.10)
<i>EDUCATION</i> _{<i>t</i>-1}					1.12 (1.33)	1.11 (1.30)
<i>CPI</i> _{<i>t</i>-1}						0.94* (0.46)
Observations	207	207	207	207	198	198
R-squared	0.270	0.279	0.314	0.332	0.308	0.331
Number of countries	23	23	23	23	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland (columns 5 and 6). **p* < 0.10; ***p* < 0.05; ****p* < 0.01.

Table B.III – Primary balance, government polarization and education

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dep. Var.: PRIMARY BALANCE (% GDP)					
<i>EDUCATION</i> _{<i>t</i>-1}	-0.21 (1.30)	0.15 (1.37)	0.78 (1.22)	-0.20 (1.01)	-0.27 (1.02)	0.66 (1.09)
<i>POLARIZATION</i> _{<i>t</i>-1}	0.55 (3.47)	0.081 (3.21)	-0.42 (3.32)	-1.07 (3.21)	-1.60 (3.15)	-1.54 (3.04)
<i>(POLARIZATION*EDUCATION)</i> _{<i>t</i>-1}	-0.027 (0.17)	0.0025 (0.16)	0.030 (0.16)	0.059 (0.16)	0.082 (0.16)	0.080 (0.15)
<i>DEBT</i> _{<i>t</i>-1}		0.068* (0.035)	0.053 (0.040)	0.068* (0.040)	0.067 (0.041)	0.068 (0.040)
<i>INTEREST</i> _{<i>t</i>-1}		0.41 (1.01)	0.47 (1.17)	0.27 (1.15)	0.13 (1.12)	0.091 (1.07)
<i>UNEMP</i> _{<i>t</i>-1}			-0.031 (0.26)	-0.21 (0.29)	-0.25 (0.28)	-0.23 (0.27)
<i>GDP GROWTH</i> _{<i>t</i>-1}			0.53*** (0.14)	0.37** (0.17)	0.35** (0.16)	0.36** (0.16)
<i>INFLATION</i> _{<i>t</i>-1}			-0.11 (0.34)	-0.20 (0.39)	-0.22 (0.38)	-0.19 (0.38)
<i>OPEN</i> _{<i>t</i>-1}				0.051** (0.020)	0.052*** (0.018)	0.055*** (0.018)
<i>POP</i> _{<i>t</i>-1}				-0.20** (0.084)	-0.18** (0.083)	-0.13 (0.083)
<i>CPI</i> _{<i>t</i>-1}					0.80* (0.45)	0.85 (0.50)
<i>LITERACY</i> _{<i>t</i>-1}						0.78 (0.47)
Observations	198	198	198	198	198	198
R-squared	0.305	0.354	0.409	0.451	0.462	0.479
Number of countries	22	22	22	22	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table B.IV – *The falsification test: randomization of LITERACY*

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dep. Var.: PRIMARY BALANCE (% GDP)</i>					
<i>LITERACY</i> _{<i>t</i>-1}	-0.26 (0.43)	-0.28 (0.41)	-0.22 (0.41)	-0.18 (0.39)	-0.086 (0.40)	-0.12 (0.41)
<i>POLARIZATION</i> _{<i>t</i>-1}	-0.52 (1.47)	-1.04 (1.50)	-1.14 (1.38)	-0.93 (1.39)	-0.014 (1.29)	0.058 (1.35)
<i>(POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	0.11 (0.30)	0.21 (0.30)	0.23 (0.28)	0.22 (0.28)	0.035 (0.26)	0.017 (0.27)
<i>DEBT</i> _{<i>t</i>-1}		0.049 (0.040)	0.035 (0.040)	0.046 (0.039)	0.066 (0.040)	0.065 (0.041)
<i>INTEREST</i> _{<i>t</i>-1}		0.25 (0.61)	0.24 (0.72)	0.24 (0.71)	0.32 (1.15)	0.19 (1.12)
<i>UNEMP</i> _{<i>t</i>-1}			-0.027 (0.24)	-0.16 (0.25)	-0.22 (0.29)	-0.25 (0.29)
<i>GDP GROWTH</i> _{<i>t</i>-1}			0.60*** (0.13)	0.50*** (0.17)	0.36** (0.16)	0.34** (0.15)
<i>INFLATION</i> _{<i>t</i>-1}			-0.10 (0.32)	-0.17 (0.37)	-0.22 (0.42)	-0.24 (0.40)
<i>OPEN</i> _{<i>t</i>-1}				0.048** (0.020)	0.052** (0.022)	0.052** (0.020)
<i>POP</i> _{<i>t</i>-1}				-0.20*** (0.065)	-0.20** (0.088)	-0.18** (0.086)
<i>EDUCATION</i> _{<i>t</i>-1}					-0.20 (1.04)	-0.25 (1.05)
<i>CPI</i> _{<i>t</i>-1}						0.77 (0.48)
Observations	206	206	206	206	198	198
R-squared	0.302	0.326	0.412	0.450	0.451	0.461
Number of countries	23	23	23	23	22	22

Notes: The table reports regression coefficients and (in brackets) the associated robust standard errors with FE estimator. The constant, a set of time dummies and of country dummies are included in the estimations but not reported in the table. The values of *EDUCATION* are not available for Iceland (columns 5 and 6). **p* < 0.10; ***p* < 0.05; ****p* < 0.01.

Table B.V – *Unobservable variables*

a) First test by Chetty et al. (2014a, 2014b)

	<i>Predicted PRIMARY BALANCE</i>
<i>LITERACY</i>	0.0412
<i>POLARIZATION</i>	-0.077
<i>LITERACY*POLARIZATION</i>	-0.0595

Notes: *Predicted PRIMARY BALANCE* is the predicted value of a series of yearly OLS regressions where the dependent variable is the general government primary balance over GDP and the regressors are the: i) the interaction between country size (i.e. land area in squared kilometers; source: the World Bank – Food and Agriculture Organization) – as proxy of fiscal decentralization (Panizza 1999) – and political stability, that is an overall indicator about perceptions of destabilization or overthrowing of the government in power (source: the World Bank – Governance Indicators); and ii) ethnic fractionalization (Alesina et al. 2003). We report the pairwise correlations between *Predicted PRIMARY BALANCE* and our main independent variables (*LITERACY*, *POLARIZATION* and their interaction) included in our main model. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

b) Second test by Chetty et al. (2014a, 2014b)

VARIABLES	(1)	(2)
	<i>Dep. Var.: Predicted PRIMARY BALANCE</i>	<i>Dep. Var.: PRIMARY BALANCE</i>
<i>LITERACY</i> _{<i>t</i>-1}	-0.099 (0.063)	-0.19 (0.68)
<i>POLARIZATION</i> _{<i>t</i>-1}	-0.35 (0.26)	-5.37* (2.71)
<i>(POLARIZATION*LITERACY)</i> _{<i>t</i>-1}	0.069 (0.054)	1.08* (0.56)
<i>DEBT</i> _{<i>t</i>-1}	-0.00039 (0.0034)	0.062 (0.036)
<i>INTEREST</i> _{<i>t</i>-1}	0.080 (0.11)	-0.26 (0.79)
<i>UNEMP</i> _{<i>t</i>-1}	0.017 (0.038)	-0.19 (0.27)
<i>GDP GROWTH</i> _{<i>t</i>-1}	0.073** (0.032)	0.55*** (0.16)
<i>INFLATION</i> _{<i>t</i>-1}	0.049 (0.050)	-0.058 (0.30)
<i>Predicted PRIMARY BALANCE</i>		0.67* (0.35)
Observations	207	207
R-squared	23	23
Number of countries	0.909	0.445

Notes: The dependent variables are the predicted primary balance over GDP in column (1), and the primary balance over GDP in column (2). Time dummies are included in the estimates (coefficients are omitted in the table). Estimates are derived from FE regressions with standard errors robust to heteroscedasticity. All regressions are estimated with an intercept term. Standard errors in round brackets. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.