

The (fiscal) price of diversity:
preference heterogeneity, electoral institutions
and budgetary performance

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Abstract**

The political and economic determinants of budgetary performance are still an intensely researched topic. This paper sheds new light on this theme by analysing the impact of economic preference heterogeneity stemming from income inequality and electoral institutions on fiscal performance of governments. The underlying argument is quite simple: strong heterogeneity of preferences among voters induces policy makers to use fiscal policy to "buy" as many societal groups as possible to secure (re-)election and a governing majority. More proportional systems enable even small groups to get their representatives elected, whereas majoritarian electoral systems restrict the range of preferences to be translated into the political arena. Therefore, changes in income inequality and the character of the electoral system interact to shape the budgetary performance of countries. We test our predictions using time-series cross-section analyses of OECD countries.

KEYWORDS: fiscal policy, social polarisation, income inequality, electoral institutions

JEL classification: E62, H61, H62

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1 Introduction

Over the last thirty years, a large literature has developed trying to explain the fiscal performance of governments (for overviews, see Alesina and Perotti (1994); Mueller (2003)). Of course, a country's budgetary performance comprises a number of dimensions on the revenue and the expenditure side, as well as with respect to the overall balance sheet. In this paper we shall look at the two most prominent aspects: the size of government (overall and with respect to social expenditures) and the existence of budget deficits in OECD countries since 1970s.

Naturally, fiscal performance cannot be explained by one single hypothesis (Mueller (2003)). Instead, there is a variety of factors influencing the budgetary policy, which are often divided into three categories (Brosens and Wiertz (2006), Woo (2003a)). Firstly, certainly economic factors affect countries' budgetary behaviour. For example, the probability of increasing budget deficits is higher in times of economic recessions, where economic growth stalls and unemployment is on the rise (Woo (2003a)).

Additionally, institutional features were found to influence fiscal policy. A great number of studies have focussed on economic institutional determinants like the creation of the Stability and Growth Pact (SGP) or the existence of fiscal rules (Buti, Martins, and Turrini (2006); Debrun and Kumar (2006); Brosens and Wiertz (2006); Wyplosz (2005); Strauch, Hallerberg, and von Hagen (2006)). Apart from these economic-institutional factors, electoral institutional factors are also extensively discussed (Persson and Tabellini (1999), Persson, Roland, and Tabellini (2006) among others).

Thirdly, there are few empirical and a few theoretical studies socio-political components like social polarisation are mentioned to influence the budgetary performance (Woo (1999), Woo (2003a), Alesina, Baqir, and Easterly (1999)).

While theoretical and empirical research on institutional determinants has been quite extensive, the "input"-side of the political process, that is the impact of voter's heterogeneity in their economic preferences, has been

less thoroughly examined. Especially, the impact of income inequality and electoral institutions on fiscal policy performance has so far been neglected. As economic polarisation is not translated automatically into preferences in the legislative arena, these preferences have to be aggregated through the electoral process. Elections therefore function as gate keepers, deciding which preferences will be realised and which preferences need to be taken into account to ensure majorities for parties and candidates. In a nutshell our paper investigates the impact of income inequality and electoral institutions on fiscal policy performance hypothesizing that social polarisation should only have a measurable impact on budgetary performance, if it is translated into the political arena. This should be the case in proportional electoral systems, whereas majoritarian (first-past-the-post) systems should be more restrictive, thus moderating the impact of economic preference heterogeneity.

We test our reasoning using time series cross-sectional data of OECD countries. Our analysis finds empirical evidence that, in general, increasing income inequality is statistically associated with higher government spending. However, once the electoral system is taken into account, we find that this effect is moderated depending on the electoral system in place. While in proportional systems social polarisation does indeed lead to higher spending, this does not hold for majoritarian systems. We also find some evidence, although somewhat weaker, that the same relationships hold when we look at social expenditure only. Finally, there is no evidence that the electoral system and income inequality affect the overall budget deficits, confirming previous claims that higher spending in proportional systems is usually met by higher revenues.

The remainder is structured as follows. Section 2 shortly reviews the main theoretical and empirical determinants of fiscal policy performance. Subsequently, section presents 3 our main theoretical argument. Section 4 introduces to the econometric framework used in the analysis and section 5 discusses the results of the empirical analysis. Finally, section 6 concludes.

2 Literature review: Determinants of fiscal policy performance

This section briefly reviews the main structural determinants of fiscal policy performance and presents empirical evidence gathered so far in the literature. Accordingly, this section is divided into three subsections each introducing different determinants of budgetary performance: (i) institutional, (ii) socio-political and (iii) economic factors.

2.1 Institutional variables

Fiscal performance is often explained by institutional variables. While many studies focus on the impact of economic institutional aspects like the creation of fiscal rules or the establishment of the Stability and Growth Pact (Alesina and Perotti (1996); Buti, Martins, and Turrini (2006); Debrun and Kumar (2006); von Hagen (1992); Kontopoulos and Perotti (1999); Strauch, Hallerberg, and von Hagen (2006); Brosens and Wierds (2006); Wyplosz (2005), among others) our analysis focuses on electoral institutional variables. To be more precise, we follow Persson and Tabellini (1999) in concentrating on the electoral rule, contrasting proportional and majoritarian electoral systems. Unlike them we do not consider explicitly the parliamentary regime type, as we are primarily interested in the "input"-side of the political process.

There are several theoretical arguments why the distinction between majoritarian and parliamentary regime types might indeed be useful. Under majoritarian regimes the increasing competition between parties focuses on some key marginal districts resulting in less public goods, less rents for politicians, more redistribution and larger government Persson and Tabellini (1999). In contrast, parliamentary regimes there is an increased competition between both politicians and voters leading to less public goods, less rents for politicians, less redistribution and smaller government Persson and Tabellini (1999).

Empirical studies show that electoral rules do influence fiscal policy. The

general finding is that majoritarian elections are associated with smaller government spending, smaller budget deficits and smaller welfare states than proportional elections (Persson, Roland, and Tabellini (2006)). Similarly, Persson and Tabellini (1999) find strong and robust support for the prediction that both the size of government and the size of government is smaller under presidential regimes, and weaker support for the prediction that majoritarian elections are associated with less public goods.

Additionally, it is often argued that coalition governments spend more (or run larger budget deficits) than single-party government. The theoretical conjecture usually advanced is the so-called "common pool problem" in fiscal policy (Weingast, Shepsle, and Johnson (1981); Persson, Roland, and Tabellini (2006); Hallerberg and von Hagen (1999); Tornell and Lane (1998); Velasco (1999, 2000); Krogstrup and Wyplosz (2006)). The common pool problem results when there is more than one decision maker involved in setting the budget. These decision makers represent different constituencies they care about and compete for their preferred public goods. In doing so they fail to internalise the costs of their choices on current and future costs in terms of higher taxes needed for debt service and payments, which results in a deficit bias. These theoretical aspects have been analysed also empirically. The general finding is that the common pool problem plays a crucial role in explaining budgetary performance (Fabrizio and Mody (2006); Persson, Roland, and Tabellini (2003); von Hagen (1992); von Hagen and Süppel (1994); Poterba and von Hagen (1999)). Note that there is a strong correlation between the electoral system and the number of government parties, with proportional systems usually leading to coalition governments, whereas majoritarian systems tend to produce single-party governments.

Recently, Persson, Roland, and Tabellini (2006) found empirical evidence that the regime type influences government spending. They conclude that parliamentary representation induces more government spending, but only indirectly, via party formation and the incidence of coalition governments. They show that the distinction between single-party and coalition govern-

ments is indeed central for the size of public spending. The central mechanism is that, at the polls, voters can discriminate between the parties of a coalition government while they cannot discriminate between different factions of a single party in government. This creates electoral conflict “an electoral common pool problem” (Persson, Roland, and Tabellini (2006, p. 3)) within a coalition government but not within a single-party government. Persson, Roland, and Tabellini (2006) conclude that a full scale shift from majoritarian to proportional elections raises overall public spending by about 5% of GDP. Similarly, Grilli, Masciandaro, and Tabellini (1991) find that public debts and primary deficits are much greater in the proportional parliamentary regimes in 18 OECD countries.

Consequently, we expect that fiscal performance depends on the type of electoral system (proportional versus majoritarian).

2.2 Socio-political variables

With regard to socio-political variables, one explanation found in the political economy literature is that social polarisation has a strong influence on fiscal policy performance. Social polarisation is often associated with both socio-political instability and coordination failure (Woo (2005)).

Tabellini and Alesina (1990) argue that budget deficits are the result of heterogeneous preferences concerning the size and the distribution of public goods. As the political party in office represents the preferences of its own constituency and voters are heterogeneously distributed within a society, the provision of public goods is biased (for a similar argument see Lambertini (2003)). Accordingly, the model of Tabellini and Alesina (1990) implies that the provision of public goods follows a political rationale and is connected to the probability of being reelected. Similarly, Persson and Svensson (1989) argue that the voters’ heterogeneous preferences result in different sizes of government spending. Furthermore, Woo (1999) develops a model of fiscal policy in which polarisation of preferences plays a crucial role in the evolution of fiscal deficits. In highly polarised societies, policy makers face greater

incentives to insist on higher spending for their preferred sectors, leading to larger overall deficits.

One way to operationalize social polarisation is to use data on income distribution. Generally, unequal income distribution may lead to populist fiscal policies and poor macroeconomic performance (Woo (2003a)). Alesina and Rodrik (1994) and Persson and Tabellini (1994) show in their models that strong social divergence, measured by unequal income distribution, leads a government to engage in redistributive policies that may be harmful for economic growth. Another explanation why high income inequality may lead to lower growth rates is given by Alesina and Perotti (1996), Perotti (1996) and Woo (2005). They show that a high degree of social polarisation may lead to shorter tenure in office of policymakers leading to an increasing probability of short-term policies at the expense of macroeconomic stability.

There are very few empirical studies on the impact of income inequality on fiscal deficits. This fact may be partly explained by the lack of high quality (time series) data for income distribution.¹ Some of the few empirical investigations are by Woo (1999), Woo (2003a) and Fischer (1993) who all find evidence that income inequality is positively associated with fiscal deficits.

Summing up, the evidence assembled so far in the literature finds that countries with a high degree of social polarisation, equivalent to a high degree of income inequality seem to have more unsustainable fiscal policies leading to budget deficits and volatile fiscal outcomes, respectively. Note however, that none of the studies we know of have yet investigated the interaction between polarisation and the electoral institutions.

2.3 Economic variables

There is strong empirical and theoretical evidence that fiscal performance is also determined by economic factors that need to be controlled for.

¹The only comprehensive data sets on income distribution are from Deininger and Squire (1996) and UNU-WIDER (2005).

Following existing studies (Woo (2003b) among others) the real GDP growth rate may influence the fiscal performance. The growth rate serves as a proxy for the economic condition of a country. Consequently, we expect the real GDP growth rate to have a positive impact on the fiscal performance, implying that the higher the growth rate the better the fiscal performance.

Moreover, inflation of consumer prices may affect the fiscal performance through several channels. Increasing inflation rates can have a positive impact on fiscal deficits via the payment of higher nominal interests and via lower real tax revenues. If the income taxes are not indexed to inflation, these effects may be partially offset by the positive impact of bracket creep on income tax revenue (Woo (2003a, p. 392)).

We expect the unemployment rate to have a positive impact on the fiscal performance. The higher the unemployment rate the higher the social expenditures, leading to higher fiscal deficits.

Finally, population aging is also an important factor. In the OECD countries under consideration in this paper, we observe a steady rise in the share of the elderly, which has profound implications for government budgets. Increasing longevity and falling fertility rates lead to an increasing ratio of retirees to workers. This in turn puts upward pressures on pension and health care spending. This effect is all the more pronounced, the heavier pension income relies on unfunded, state-run pay-as-you-go systems and the more health care is provided through public programmes. The impact of aging on overall government balances depends on whether it is possible to increase taxation sufficiently to finance these rising expenditure needs.

3 Theoretical argument: Preference heterogeneity and the electoral system

In this section we present our own theoretical reasoning about the conditional impact of income polarisation and electoral institutions. Our basic assumption is that increasing income inequality leads to increasing differences of

preferences for public goods, social transfers and taxation. The poorer the median voter is relative to the average income earner, the more he will prefer public over private goods, the more he will prefer income redistribution from high to lower income earners and the more he will support higher taxation on higher incomes. The intensity of political competition and the identity of the median voter, however, depends on the electoral system.

In majoritarian systems, only one candidate will be elected per district. This implies that parties may not need to win an absolute majority of votes to win a majority of parliamentary seats. Such a system also usually leads to two-party systems (see Lijphart (1999)), which naturally restricts the diversity of preferences that will be represented in parliament. This is in stark contrast to proportional systems, where usually more than one candidate per district gets elected. In the extreme case, there is only one district for the whole country and parliamentary seats are allocated according to the votes received. In other words, the correlation between votes received and seats earned is much stronger in such a system. As a result, proportional systems are usually associated with multi-party parliaments and coalition governments (see Lijphart (1999)). Thus, small parties stand a chance to also enter the legislative arena. This allows parties to ignore the preferences of the median voter but also to appeal to “special interest”-constituencies. In addition, in a one-district the median voter will be the median of the whole electorate. This need not be the case in a majoritarian system.

As Persson, Roland, and Tabellini (2000) have shown before, these properties of different electoral institutions shape fiscal policy. Proportional systems tend to produce broader redistribution and public goods, whereas majoritarian systems lead to more targeted spending. Once income inequality increases, the demand for redistribution and public good provision also increases. This change in preferences will be directly felt within a proportional system. The reason is twofold: first, the changes in the median voter’s preferences will have to be taken into account by (at least the big) parties and candidates when competing for votes. Second, more income diversity offers

opportunities for smaller parties to appeal to certain segments of the income distribution. Since single-party governments are unlikely in such a system, finding a stable coalition implies that a greater number of diverse constituencies needs to be accommodated. Intra-government log-rolling will be a likely outcome. In addition, large parties aiming for a relative majority in parliament will have to appeal to a more heterogeneous populace, which increases necessities to offer more diversified spending programmes.

In a majoritarian system, changes of preferences due to increasing social polarisation are not immediately translated into the political system. Even if the preferences or the identity of the median voter of the whole voting population changes, this may not affect candidates' election chances in different districts. Also, since only one candidate wins per district, newly emerging smaller voter segments and their preferences will hardly find chances to get representatives elected. Intra-government log-rolling does not occur. The necessity to "buy" many smaller groups does therefore not exist.

As a result, we expect increasing income inequality to lead to stronger upward pressures in government spending in proportional electoral systems. This effect should be much less pronounced in countries where preferences are "filtered" through a first-past-the-post election system. Similar reasoning might lead us to expect higher budget deficits as a result of increasing polarisation in proportional systems, but not in countries with majoritarian institutions.

4 Empirical analysis

To test the interaction of income inequality and electoral variables on fiscal performance, we use annual data on 20 OECD countries for the time period 1975-2004.²

²For an overview of the countries included in the analysis, see the appendix. Note that our theoretical argument presupposes a functioning democracy. That is why we dropped the years 1975 for Portugal and 1975-76 for Spain, since both countries were still dictatorships in these years.

4.1 Variables and Definitions

As indicators of fiscal performance, we will look at total government expenditure as a percentage of GDP (govexp), social expenditure as a percentage of GDP (socexp), government net lending as a percentage of GDP (govbalance) and total government liabilities as a percentage of GDP (govliab).³

As economic control variables, we employ the real growth in GDP (realgdp), unemployment rate (unemp) and the change in the consumer price indices (infl). To take the impact of population aging into account, we use the ratio of people aged 65 and older to the total population (pop65).

Two indicators are used to measure social polarisation.⁴ First, we take the Gini coefficient on gross income (ggini), that is, income *before* taxes and transfers. This is the socio-political variable of greatest interest to us, since a high degree of gross income inequality should increase the political pressure for redistributive measures via taxation and social transfers. In addition, we also look at the impact of the Gini coefficient measured on disposable income, that is, income *after* taxes and transfers. It has to be noted, however, that for both measures there exist quite a number of country-years, where no estimates were available, which in turn reduces the number of useable observations. This problem of missing values is somewhat more acute for the “gross” Gini coefficient. Also, the quality of these data is reduced because they are from different sources. Nevertheless, we tried as much as possible to ensure that the measuring approaches were always equivalent. In particular, we always tried to include only those Gini coefficients that used “household” or “family” as their income unit, that focused on “person” as unit of analysis and that adjusted their estimates for household size. For the gross Gini variable, we preferred estimates relying on gross income rather than market income. In a few cases, we resorted to “gross monetary income” and “earnings

³Definitions and sources for all dependent and independent variables are provided in the appendix.

⁴We used the data provided by UNU-WIDER (2005). To our knowledge this is the most extensive and up to date data set currently available.

gross”. Regarding the net Gini variable, we used only those entries that relied on “disposable income”. Only if that measure was not available did we, in a few cases, rely on “monetary disposable income”. Given our very conservative use of the data, we are quite confident that *ggini* and *ngini* provide theoretically and empirically sound estimates of income inequality in our sample.

With respect to the electoral system, we decided against using a simple dummy (or categorical) variable, which merely distinguishes between majoritarian and proportional (and semi-proportional) systems. Such a measure would be way too broad and would thus miss considerable differences that exist within each of the categories. The type of electoral formula⁵, district magnitude as well as existence and size of voting thresholds all combine to determine the proportionality of a given electoral system. This means that a more refined measure is needed to capture the subtle differences in proportionality that exist between different electoral systems. Therefore, we chose to employ a least squares index which has been proposed by Gallagher (1991) and has also become known as the Gallagher index . It measures the degree of disproportionality in a given electoral system. Its computation is quite straightforward:

$$disprop = \sqrt{\frac{1}{2} \sum_{i=1}^m (v_i^2 - s_i^2)} \quad (1)$$

v_i denotes the number votes obtained by party i , s_i is the share of seats i gets, and m is the number of parties. The idea behind this index is quite obvious: disproportionality is conceptualized as the difference between vote and seat shares of each party, weighted by the size of the deviations. Unlike other indices such as the Loosemore-Hanby index, it puts therefore a higher weight on a few large vote-seat-deviations, than on many small discrepan-

⁵The electoral formula determines how votes are translated into parliamentary seats. Broadly, one can distinguish between highest average methods such as d’Hondt, Sainte-Laguë and their modified versions, and the largest remainder approach that uses quotas such as the Hare- or Droop quota. For overviews, see Lijphart (1999) and Norris (1997).

cies (Gallagher (1991), p. 40), thus making the Gallagher disproportionality index score immune to the existence of many small parties. Estimates of this indicator were taken from the recently updated data set by Armingeon, Leimgruber, Beyeler, and Menegale (2006).⁶

Finally, to test our hypothesis that the impact of social polarization is conditioned by the electoral system, we interact our disproportionality indicator (disprop) with our gross Gini variable (ggini).

4.2 Specification and estimation

For each of the four dependent variables we ran panel regressions using two different estimation methods. Beck and Katz (1995) have argued for using OLS with panel corrected standard errors (PCSE) when dealing with typical small sample time-series cross-section data. They claim that this method produces more accurate standard errors than feasible generalized least squares (Parks, R. (1967)). However, in a very recent working paper, Chen, Lin, and Reed (2006) report Monte Carlo studies that suggest the opposite: in most cases PCSE is less efficient than FGLS (except when $N=T$). As the number of time periods increases relative to the number of cross sections, the efficiency advantage of the FGLS estimator vis-a-vis the PCSE approach becomes larger. Therefore, we decided to give primary emphasis to the results we obtained using FGLS. However, as a robustness check we also employed PCSE (see next section) but did not find any differences in the substantive results.

Since the Wooldridge test for autocorrelation in panel data (Wooldridge (2002)) clearly indicates the presence of first-order autocorrelation, all estimations specified a first-order autoregressive process in the disturbance term with a common autocorrelation coefficient (ρ) to all the panels.

⁶Note that from an econometric perspective, this index has another important advantage over a simple categorical variable: it offers sufficient within-country variation to allow controlling for unit heterogeneity (i.e. fixed-effects estimation strategies can be used).

The basic set-up of our empirical analysis is thus

$$y_{i,t} = \alpha + \beta_1 \mathbf{x}_{i,t} + \beta_2 w_{i,t} + \beta_3 z_{i,t} + \beta_4 w_{i,t} \times z_{i,t} + \nu_i + \eta_t + \epsilon_{i,t} \quad (2)$$

where the subscripts $i = 1, \dots, N$ and $t = 1, \dots, T$ denote the country and the year, \mathbf{x} is a vector of economic variables, w denotes the Gini variable and z stands for the disproportionality of the electoral system. To account for unit heterogeneity, we included country dummies (ν_i). In addition, we controlled for common shocks by including time dummies (η_t) that mark the decade under observation.⁷ The disturbance term is given by

$$\epsilon_{i,t} = \rho \epsilon_{i,t-1} + \mu_{i,t} \quad (3)$$

with the common autocorrelation parameter $\rho = \frac{\rho_1 + \rho_2 + \dots + \rho_n}{n}$ and $\mu_{i,t}$ being the part of the residual that is independent and identically distributed.

Since we want to test for a conditional effect using an interaction term, simply looking at the estimated coefficients is insufficient and possibly even misleading. Therefore, we calculated the marginal effects (and their standard errors and t-statistics) of the Gini variable on our dependent variables for different values of our disproportionality index. These values range from the sample minimum to the maximum in steps of 5 units. The marginal effects are obtained by taking the first derivative with respect to w :

$$\frac{\partial y}{\partial w} = \beta_2 + \beta_4 z \quad (4)$$

To facilitate interpretation, we also created graphs that visualize the impact and statistical significance of income inequality on budget performance for different degrees of disproportionality of the electoral system.

4.3 Results

Looking at the results of our analyses of overall government expenditures (Table 1), we find a clear-cut picture regarding the economic variables. Ris-

⁷We decided to include a dummy for the 1970s (time70) to account for the deterioration in government budgets due to the two oil price shocks; a dummy for the 1980s (time80) and, finally, a dummy that marks the period 1990-2004 (time90)

ing unemployment increases public expenditures, whereas strong economic growth reduces them. Also not very surprising given our explications in section 2.3 is the result that an increase in the relative number of people aged 65 and above is positively associated with higher spending. Note, however, that this finding is not quite significant in the full specification. The coefficient on `time70`, our time dummy for the 1970s, is strongly positive and highly significant, thus capturing the strong common impact that the two oil crises exerted on government spending. Finally, the inflation rate exhibits a negative influence in all specifications, but is only statistically significant in the economic baseline model (1).

Insert Table 1 here.

Turning to our inequality measures, we do not find an unconditional effect of the gross Gini variable (`ggini`). This is not surprising, since our theoretical argument hypothesized a conditional relationship. Hence, the partial specifications should suffer from an omitted variable bias. However, regardless of the proportionality of the electoral system, a high net Gini coefficient is indicative of a lack of fiscal income equalization via taxation and redistribution. This explains why an increase in `ngini` is associated with lower spending. This underlines why net gini variables are an inappropriate predictor of fiscal behaviour. They are to a large extent themselves determined by the tax and transfer system. As a result, only gross income inequality measures are useful independent variables, for only they avoid this problem of reverse causality. It seems that this point has been ignored in other studies testing the impact of Gini variables on fiscal policy (e.g. Woo (2003a,b)).

To analyse the conditioning effect of the electoral system, let's turn now to the full model containing the interaction term. As noted above, simply looking at the coefficients of the lower order terms and the interaction is insufficient. Interpreting the two lower-order terms (`ggini` and `disprop`) is meaningless, because they represent the effect if the other variable's value is zero. In other words, the coefficient on `ggini` denotes the effect of income inequality when `disprop` is zero. However, `disprop` is never zero in our sample,

there is no country with a perfectly proportional election system. Therefore, the coefficient of ggini is a hypothetical one. The same reasoning holds for disprop. Consequently, the coefficient on the interaction term indicates the impact of an increase in ggini on government spending, when disprop is not zero. Yet, to make meaningful statements, we need to consider the marginal effects of ggini for different values of disprop as explained above. Table 2, shows these marginal effects for values of disprop ranging from the sample minimum to maximum (see Figure 1). Column 1 denotes the marginal effect, while column 2 and 3 show the standard errors and t-statistics respectively. Figure 1 gives a visualization of these values. As is easily observable from the table and the graph, for low levels of disprop, that is, in systems with high proportionality, increasing income inequality is associated with increasing expenditures (although the effect is not quite statistically significant). However, as the disproportionality increases, the effects of ggini become negative, and increasingly so (see the downward sloping curve). Also, the significance of these negative effects increases as the values for disprop rise. This can be taken as a first indication that the proportionality of the electoral system conditions the impact of social polarization on government expenditures.

Insert Table 2 here.

If we look at a sub-category of government spending, namely social expenditures as dependent variable (Table 3, we can observe a similar pattern. As for the economic variables, we find the same coefficient signs as in the previous case. The negative impact of the inflation rate is more significant now however. Also, note the huge size of the coefficients on time70, reflecting the deep oil shock induced recessions of the 1970s, that led to an increase in social spending. In the incomplete specifications, ggini is very small and slightly negative. Yet only the full specification including the interaction term gives a complete picture. The same caveats regarding the interpretation of regression coefficients apply. When looking at the marginal effects (Table 2 and Figure 2), we again find that in the face of increasing income inequality, more majoritarian (i.e. disproportional) systems exhibit

ever smaller social expenditures. Again, the significance increases with disproportionality. The negative values for the marginal effects increase and the curve is again downward sloping.

Insert Table 3 here.

Let's turn next to the results regarding government balances (Table 4. Regarding the economic variables, *realgdp* and *unemp* behave as expected and are significant at conventional levels: increasing economic growth is associated with higher government balances (which is no surprise since we did not cyclically adjust our measure of the government balance), whereas increasing unemployment rates increase budget deficits. The behaviour of *pop65* is somewhat confusing. Not only does the significance vary greatly, but also the sign switches between different specifications. Unlike in the previous models, the time dummies remain insignificant. Looking at the complete specification, we find the coefficient of the interaction term positive and significant. This is a first hint that increasing inequality is not associated with higher deficits in disproportional systems. Studying the marginal effects and their standard errors confirms this first impression. In very proportional electoral systems (lowest value for *disprop*), increasing inequality leads to a decrease in government balances, the marginal effect is positive, though not quite significant at a conventional level. However, as the upward sloping curve indicates (see Figure 3), when the electoral system becomes less proportional, higher social polarisation is no longer associated with increasing deficits. Rather, more majoritarian institutional settings are associated with higher budget balances. Hence, again we find evidence for a conditional effect of income inequality on budgetary performance.

Insert Table 4 here.

Finally, the impact on government liabilities is tested. As expected, the unemployment rate is positively associated with the overall debt burden. Also not very surprising is the finding that inflation reduces the government debt. Interesting to note is the large positive coefficient and high statistical

significance of pop65. Therefore, population aging seems to have the biggest impact on the overall debt level, more so than on expenditure rates and budget balances. Regarding the Gini variable, in the partial specification it is significant and has a intuitive positive sign, suggesting that greater inequality leads to higher debt burdens. However, in the full specification, we do not find a significant coefficient on the interaction term. It has the negative sign, which would be in accordance with our theoretical argument. Looking at the marginal effects (Table 2, Figure 4), we find that the more proportional the electoral system, the higher the debt burden associated with increasing social polarisation. As disprop increases, the size of the marginal effect shrinks, indicating that higher income inequality leads to a smaller increase of the government debt in more majoritarian systems than in more proportional ones. However, these effects are never statistically significant at conventional levels, thus casting doubt on their validity.

Insert Table 5 here.

4.4 Robustness checks

To check the robustness of our results, we ran several alternative regressions. First, we repeated the whole empirical analysis using the PCSE estimator. This meant running a Prais-Winsten regression with panel corrected standard errors to account for panel heteroscedasticity and contemporaneous correlation. Again we specified a AR(1) process common to all panels. The results are explicated in table 6. To save space, the table contains only the full specification for each dependent variable. The results are very similar to the FGLS estimation, the standard errors are only slightly higher. We also calculated the marginal effects. They only slightly differ in their size and their standard errors are only slightly higher. Overall, our results are unaffected by the particular estimation strategy used.

Insert Table 6 here.

Many studies use five- or ten year averages instead of annual observations. To test whether this would change any of our results, we therefore re-estimated our models with data averaged over five years, using both PCSE and FGLS estimation. Again, to save space we only included the full specifications (see tables 7 and 8). While the sizes of the coefficients differ, their signs and significance remain broadly the same. There are only some minor changes in some cases in the economic variables. But that there are some differences is not too surprising, given that the averaged data set only offers around 50 observations, which is a dangerously low number given the use of time and country dummies. Nevertheless, the thrust of our argument is also confirmed in this analysis.

Insert Table 7 here.

Insert Table 8 here.

5 Conclusions

This paper focussed on the empirical impact of economic preference heterogeneity and electoral institutions on budgetary performance. Different economic preferences were assumed to stem from different levels of income. Thus, the more polarised income the more different are preferences for public goods and redistribution.

Analysing time-series cross-section data of 20 OECD countries over the time period of 1975-2004, we find a conditional effect of income inequality on the size of government budgets. While increasing social polarisation puts upward pressure on government expenditures, this effect is only borne out in systems that have very proportional electoral institutions. There, the more diverse economic preferences are translated into the political arena leading thus to higher government spending. In more disproportional systems, however, economic preferences are more strongly filtered by the voting system, thus preventing rising income polarisation to lead to higher government spending. Moreover, the institutional effect of the electoral system

seems even to dominate for higher values of disproportionality. These kind of electoral setting seem to be generally associated with smaller government, even in the face of increasing social polarisation. The same pattern we found for social expenditure: more majoritarian electoral institutions prevent an increase in social spending when inequality is on the rise.

With respect to budget deficits, we again observed this conditional relationship. In highly proportional systems, increasing income inequality tends to lead to higher budget deficits. Yet the more disproportional it becomes, the smaller are the budget deficits. Finally, we tested whether we could find a similar impact on the overall debt burden of a country. While the signs of the relevant coefficients and marginal effects suggests that rising polarisation leads to higher overall debts the more proportional the electoral system is, the lack of statistical leaves the validity of these findings in doubt.

As a result, our contribution to the few existing empirical studies also analysing the impact of social polarisation (Woo (1999), Woo (2003a)) is that this variable's effect is conditional on the existing electoral system. Different preferences can only affect government policy, if they find their way into the political arena. This important point has been missed in the previous literature.

Our results are still very preliminary so that further attention should be paid to several aspects: Firstly, our empirical results are still in their infancy. The robustness of our analysis should be checked further, especially by taking more countries from Latin America and Asia into account. Also, the used data of GINI coefficients contains a lot of missing values. Up to now there is no continuous time series data for GINI coefficients for all OECD countries (Atkinson (2003)). Even though we applied more cautious selection criteria, paying close attention to income definitions and adjustments than previous authors (Woo (2003b,a)), more frequent data should be created to obtain annual time series of GINI coefficients. Finally, it is necessary to find more time variant indicators for preference heterogeneity, also taking ethnic and religious factors into account, as well as opinion survey data. This is a natural

extension of this paper that we are currently working on.

Acknowledgement

We would like to thank Sebastian Hauptmeier, Friedrich Heinemann and Marcus Kappler for their valuable comments and Anna Schulze for her very helpful research assistance.

Appendix

Estimation outputs

Estimation results - FGLS

Table 1: Dependent variable: Government expenditure - FGLS

| dep. var: govexp | (1) | (2) | (3) | (4) | (5) |
|------------------|-----------------------|---------------------|----------------------|---------------------|-----------------------|
| realgdp | -0.189*** (0.029) | -0.179** (0.075) | -0.336*** (0.063) | -0.185** (0.076) | -0.196** (0.082) |
| unemp | 0.830*** (0.056) | 0.873*** (0.11) | 0.910*** (0.083) | 0.865*** (0.11) | 0.964*** (0.12) |
| infl | -0.0810*** (0.030) | -0.0809 (0.075) | -0.0245 (0.053) | -0.0810 (0.076) | -0.0494 (0.077) |
| pop65 | 0.331*** (0.11) | 0.410* (0.25) | 0.398* (0.21) | 0.400* (0.24) | 0.287 (0.24) |
| time70 | 1.576*** (0.38) | 3.006*** (0.77) | 1.132* (0.66) | 3.172*** (0.73) | 3.038*** (0.75) |
| time80 | -0.513* (0.28) | -0.762 (0.59) | -0.362 (0.44) | -0.842 (0.59) | -0.854 (0.60) |
| gini | | -0.0185 (0.078) | | -0.0225 (0.079) | 0.127 (0.100) |
| disprop | | | | 0.0299 (0.049) | 1.057*** (0.37) |
| gini × disprop | | | | | -0.0283*** (0.010) |
| ngini | | | -0.241*** (0.056) | | |
| Observations | 571 | 146 | 283 | 146 | 146 |
| Wald χ^2 | 2600.40 | 2024.53 | 1678.54 | 2926.30 | 18889.25 |
| Prob > χ^2 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Note: country dummies are not shown.

Table 2: Marginal effects for different values of disprop

| dep. var.: government expenditures | | | |
|------------------------------------|---------|--------|---------|
| disprop | dy/dx | s.e. | tstat |
| 0.37 | 0.1165 | 0.0974 | 1.1960 |
| 6.43 | -0.0549 | 0.0800 | -0.6862 |
| 12.49 | -0.2262 | 0.1034 | -2.1881 |
| 18.55 | -0.3975 | 0.1495 | -2.6589 |
| 24.61 | -0.5689 | 0.2035 | -2.7960 |
| dep. var.: social expenditures | | | |
| disprop | dy/dx | s.e. | tstat |
| 0.37 | -0.0131 | 0.0362 | -0.3620 |
| 6.43 | -0.1017 | 0.0339 | -3.0016 |
| 12.49 | -0.1903 | 0.0523 | -3.6364 |
| 18.55 | -0.2789 | 0.0780 | -3.5752 |
| 24.61 | -0.3675 | 0.1058 | -3.4742 |
| dep. var.: government balance | | | |
| disprop | dy/dx | s.e. | tstat |
| 0.37 | -0.1573 | 0.0884 | -1.7788 |
| 6.43 | 0.0701 | 0.0640 | 1.0962 |
| 12.49 | 0.2976 | 0.0745 | 3.9931 |
| 18.55 | 0.5250 | 0.1104 | 4.7538 |
| 24.61 | 0.7524 | 0.1550 | 4.8546 |
| dep. var.: government liabilities | | | |
| disprop | dy/dx | s.e. | tstat |
| 0.37 | 0.6407 | 0.2672 | 2.3975 |
| 6.43 | 0.5588 | 0.2519 | 2.2185 |
| 12.49 | 0.4769 | 0.3946 | 1.2087 |
| 18.55 | 0.3951 | 0.5901 | 0.6696 |
| 24.61 | 0.3132 | 0.8005 | 0.3913 |

Table 3: Dependent variable: Social expenditure - FGLS

| dep. var: socexp | (1) | (2) | (3) | (4) | (5) |
|------------------------|-----------------------|----------------------|-----------------------|----------------------|------------------------|
| realgdp | -0.118*** (0.018) | -0.182*** (0.042) | -0.143*** (0.031) | -0.180*** (0.043) | -0.168*** (0.043) |
| unemp | 0.353*** (0.031) | 0.262*** (0.049) | 0.293*** (0.036) | 0.262*** (0.050) | 0.288*** (0.052) |
| infl | -0.0760*** (0.017) | -0.161*** (0.033) | -0.158*** (0.026) | -0.159*** (0.033) | -0.160*** (0.032) |
| pop65 | 0.526*** (0.055) | 0.136 (0.100) | 0.343*** (0.086) | 0.137 (0.099) | 0.0615 (0.10) |
| time70 | 20.97*** (1.13) | | 18.42*** (1.66) | | 14.39*** (2.36) |
| time80 | -0.502*** (0.14) | -1.292*** (0.23) | -0.801*** (0.19) | -1.292*** (0.23) | -1.404*** (0.23) |
| ggini | | -0.0731** (0.032) | | -0.0722** (0.033) | -0.00771 (0.037) |
| disprop | | | | -0.00501 (0.025) | 0.499*** (0.17) |
| ggini \times disprop | | | | | -0.0146*** (0.0049) |
| ngini | | | -0.0879*** (0.027) | | |
| Observations | 472 | 115 | 260 | 115 | 115 |
| Wald χ^2 | 61482.76 | 5964.41 | 79436.90 | 5973.60 | 73670.67 |
| Prob > χ^2 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Note: country dummies are not shown.

Table 4: Dependent variable: Government balance - FGLS

| dep. var: govbalance | (1) | (2) | (3) | (4) | (5) |
|------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|
| realgdp | 0.164*** (0.032) | 0.113 (0.070) | 0.236*** (0.063) | 0.121* (0.070) | 0.157** (0.070) |
| unemp | -0.611*** (0.051) | -0.814*** (0.093) | -0.607*** (0.071) | -0.798*** (0.095) | -0.927*** (0.092) |
| infl | -0.0274 (0.031) | -0.148** (0.067) | -0.0676 (0.053) | -0.144** (0.068) | -0.164** (0.064) |
| pop65 | 0.449*** (0.12) | -0.0770 (0.18) | 0.646*** (0.19) | -0.0586 (0.21) | 0.0694 (0.20) |
| time70 | 0.206 (0.39) | 0.176 (0.62) | -0.461 (0.64) | 0.103 (0.67) | 0.465 (0.60) |
| time80 | 0.195 (0.29) | -0.0160 (0.54) | 0.372 (0.40) | 0.0116 (0.53) | -0.105 (0.48) |
| ggini | | 0.0965 (0.068) | | 0.0933 (0.068) | -0.171* (0.091) |
| disprop | | | | -0.0436 (0.047) | -1.398*** (0.31) |
| ggini \times disprop | | | | | 0.0375*** (0.0084) |
| ngini | | | -0.0404 (0.055) | | |
| Observations | 571 | 146 | 283 | 146 | 146 |
| Wald χ^2 | 351.71 | 527.71 | 240.91 | 270.10 | 322.00 |
| Prob $> \chi^2$ | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Note: country dummies are not shown.

Table 5: Dependent variable: Financial liabilities - FGLS

| dep. var: govliab | (1) | (2) | (3) | (4) | (5) |
|-------------------------------|---------------------|---------------------|---------------------|--------------------|--------------------|
| realgdp | 0.202* (0.11) | 0.140 (0.21) | 0.326* (0.19) | 0.150 (0.21) | 0.170 (0.21) |
| unemp | 2.529*** (0.19) | 2.224*** (0.27) | 2.425*** (0.22) | 2.222*** (0.27) | 2.239*** (0.27) |
| infl | -0.375*** (0.13) | -0.605*** (0.23) | -0.639*** (0.18) | -0.590** (0.23) | -0.588** (0.24) |
| pop65 | 7.451*** (0.51) | 7.928*** (0.72) | 6.048*** (0.71) | 8.067*** (0.81) | 7.972*** (0.84) |
| time70 | 4.202*** (1.40) | 1.354 (2.31) | 6.149*** (2.05) | 0.957 (2.46) | 1.121 (2.48) |
| time80 | -1.260 (1.00) | 0.281 (1.81) | -3.345*** (1.18) | 0.377 (1.82) | 0.166 (1.85) |
| ggini | | 0.580** (0.23) | | 0.582** (0.23) | 0.646** (0.27) |
| disprop | | | | 0.0598 (0.17) | 0.568 (1.37) |
| <i>ggini</i> × <i>disprop</i> | | | | | -0.0135 (0.037) |
| ngini | | | -0.442** (0.18) | | |
| Observations | 471 | 130 | 254 | 130 | 130 |
| Wald χ^2 | 1751.70 | 7000.17 | 1737.41 | 766.33 | 783.93 |
| Prob > χ^2 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Note: country dummies are not shown.

Graphical illustration of different marginal effects

Figure 1: Government expenditures

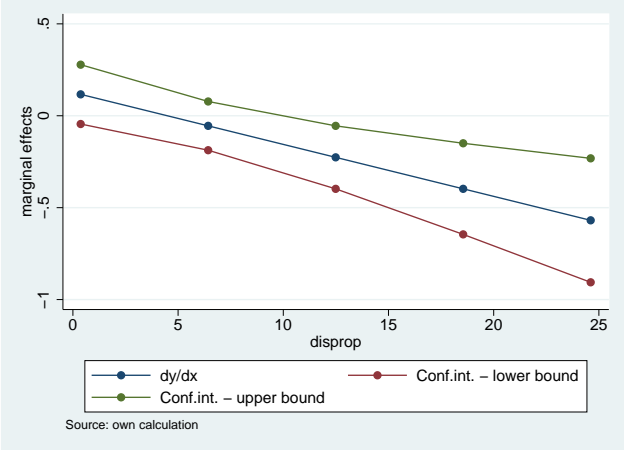


Figure 2: Social expenditures

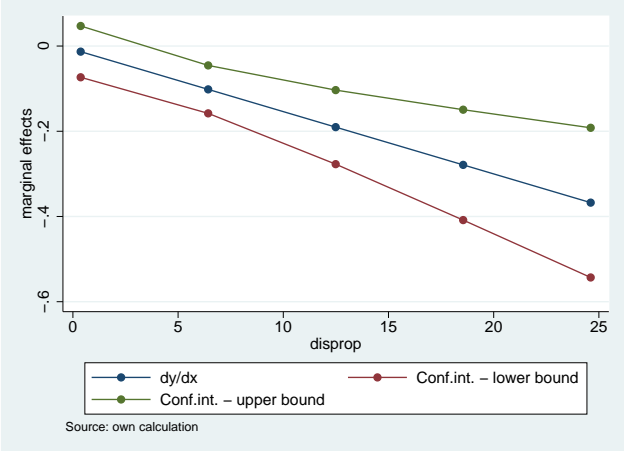


Figure 3: Government balance

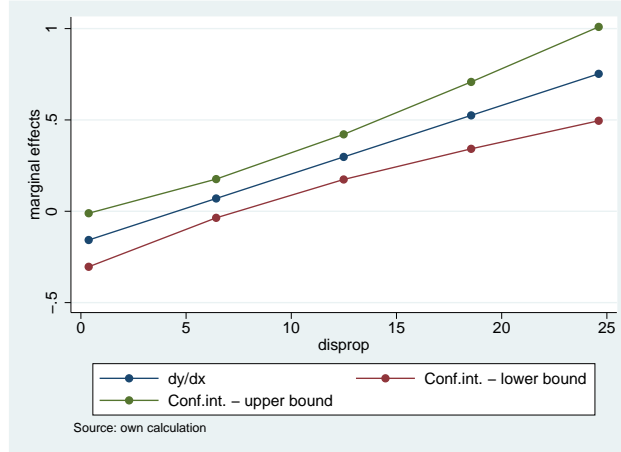
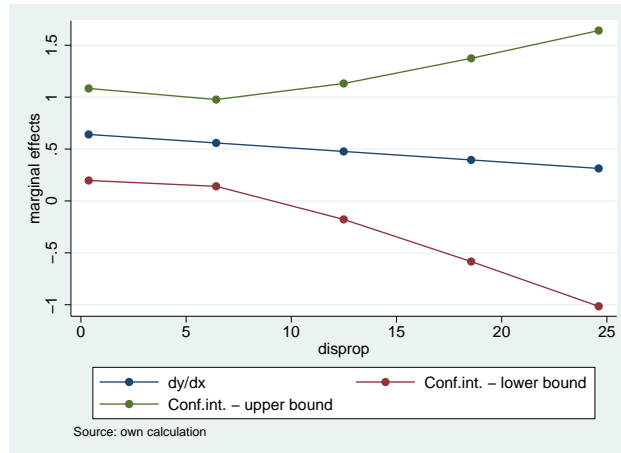


Figure 4: Government liabilities



Robustness check - full sample

Table 6: PCSE estimator

| | (1) | (2) | (3) | (4) |
|------------------------|---------------------|----------------------|-----------------------|--------------------|
| | govexp | socexp | govbalance | govliab |
| realgdp | -0.179 (0.11) | -0.203*** (0.069) | 0.183** (0.092) | 0.203 (0.26) |
| unemp | 1.053*** (0.16) | 0.332*** (0.087) | -0.941*** (0.13) | 2.136*** (0.30) |
| infl | 0.327*** (0.12) | -0.180*** (0.052) | -0.266*** (0.064) | -0.351 (0.30) |
| pop65 | 0.753** (0.33) | -0.155 (0.15) | -0.0541 (0.24) | 7.889*** (1.14) |
| ggini | 0.195* (0.11) | -0.120** (0.058) | -0.207** (0.087) | 0.344 (0.26) |
| disprop | 1.363** (0.63) | 0.319 (0.22) | -1.386*** (0.34) | -0.894 (1.50) |
| ggini \times disprop | -0.0346* (0.019) | -0.00903 (0.0061) | 0.0359*** (0.0098) | 0.0211 (0.040) |
| time70 | 3.477*** (1.31) | 21.70*** (4.07) | -0.0420 (0.85) | 2.807 (2.79) |
| time80 | -0.850 (1.05) | -1.779*** (0.35) | -0.234 (0.65) | 0.365 (2.08) |
| Observations | 146 | 118 | 146 | 130 |
| R^2 | 0.95 | 0.95 | 0.66 | 0.88 |
| Wald χ^2 | 3112.61 | 47917.91 | 267.09 | 18714.58 |
| Prob $> \chi^2$ | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Note: country dummies are not shown.

Robustness check - 5-year averages

Table 7: Robust Mean FGLS

| | (1) | (2) | (3) | (4) |
|------------------------|-----------------------|-----------------------|----------------------|--------------------|
| | govexp | socexp | govbalance | govliab |
| realgdp | 0.0965 (0.40) | -0.415*** (0.14) | -0.0280 (0.27) | 1.751* (0.94) |
| unemp | 1.061*** (0.20) | 0.243*** (0.092) | -1.013*** (0.13) | 2.608*** (0.43) |
| infl | 0.419** (0.18) | -0.292*** (0.047) | -0.631*** (0.11) | 0.288 (0.54) |
| pop65 | 0.304 (0.30) | -0.282** (0.14) | -0.0663 (0.20) | 6.045*** (1.19) |
| ggini | 0.432*** (0.16) | -0.0858 (0.074) | -0.333*** (0.10) | 0.954** (0.38) |
| disprop | 2.529*** (0.58) | 0.795** (0.33) | -2.457*** (0.43) | 3.561 (3.23) |
| ggini \times disprop | -0.0643*** (0.017) | -0.0207** (0.0097) | 0.0632*** (0.012) | -0.0767 (0.085) |
| time70 | 6.480*** (1.86) | 41.39*** (3.67) | -2.580** (1.15) | 12.11*** (4.33) |
| time80 | -2.712** (1.15) | -1.809*** (0.33) | 1.743** (0.76) | -4.370 (3.07) |
| Observations | 58 | 46 | 58 | 50 |
| R^2 | . | . | . | . |
| Wald χ^2 | 5682.66 | 247936.97 | 779.15 | 1625.68 |
| Prob $> \chi^2$ | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: Robust Mean PCSE

| | (1) | (2) | (3) | (4) |
|------------------------|----------------------|----------------------|----------------------|--------------------|
| | govexp | socexp | govbalance | govliab |
| realgdp | -0.327 (0.57) | -0.549*** (0.21) | 0.191 (0.35) | 1.198 (1.05) |
| unemp | 1.011*** (0.24) | 0.116 (0.15) | -0.919*** (0.13) | 2.201*** (0.52) |
| infl | 0.487** (0.22) | -0.324*** (0.090) | -0.570*** (0.091) | 0.419 (0.65) |
| pop65 | 0.575 (0.47) | -0.152 (0.18) | -0.151 (0.26) | 6.387*** (1.29) |
| ggini | 0.368** (0.14) | -0.188 (0.14) | -0.326** (0.14) | 0.759 (0.55) |
| disprop | 2.329*** (0.81) | 0.101 (0.56) | -2.101*** (0.32) | 3.115 (2.93) |
| ggini \times disprop | -0.0599** (0.030) | 0.000259 (0.015) | 0.0553*** (0.011) | -0.0726 (0.067) |
| time70 | 5.628*** (2.18) | 32.12*** (8.08) | -1.855* (1.00) | 12.25** (5.78) |
| time80 | -2.113* (1.17) | -1.378*** (0.53) | 1.054 (0.70) | -6.129** (2.81) |
| Observations | 59 | 49 | 59 | 51 |
| R^2 | 0.95 | 0.98 | 0.88 | 0.94 |
| Wald χ^2 | 5475.27 | 11329.58 | 954.09 | 1150.62 |
| Prob $> \chi^2$ | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Data description

Sample countries

The empirical analysis concentrates on the following OECD countries:

Australia (AUS), Austria (AUT), Belgium (BEL), Canada (CAN), Switzerland (CHE), Germany (GER), Denmark (DNK), Spain (ESP), Finland (FIN), France (FRA), United Kingdom (GBR), Greece (GRC), Ireland (IRL), Italy (ITA), Japan (JPN), Netherlands (NLD), New Zealand (NZL), Portugal (PRT), Sweden (SWE), United States (USA).

Variables: Definitions and Sources

Table 9: Description of the variables

| Variable | Time frame | Source | Description |
|---------------------------|------------|---|--|
| Economic variables | | | |
| socexp | 1975-2004 | OECD economic outlook | government social expenditure, % GDP |
| govexp | 1975-2004 | OECD economic outlook | total government disbursements, % GDP |
| govbalance | 1975-2004 | OECD economic outlook | government balance, % GDP |
| realgdp | 1975-2004 | OECD economic outlook | real GDP growth, % |
| unempl | 1975-2004 | OECD economic outlook | unemployment rate, % |
| infl | 1975-2004 | OECD economic outlook | inflation rate, % |
| govliab | 1975-2004 | OECD economic outlook | government gross liabilities, % GDP |
| pop65 | 1975-2004 | World Development Indicators | persons 65 and above, % total population |
| Socio-political variables | | | |
| ngini | | Deiningering et al. (1996), UNU-WIDER (2005) | net GINI coefficient |
| ggini | | Deiningering et al. (1996), UNU-WIDER (2005) | gross GINI coefficient |
| Institutional variables | | | |
| disprop | | Armingeon et al. 2006 | Index of disproportionality of the electoral system $\sqrt{\frac{1}{2} \sum_{i=1}^m (v_i^2 - s_i^2)}$ |

Summary statistics and correlations

Table 10: Summary statistics I

| Variable | Obs | Mean | Std.dev. | Min | Max |
|------------|-----|-------|----------|--------|--------|
| govexp | 571 | 45.93 | 8.54 | 27.39 | 72.45 |
| socexp | 472 | 20.55 | 5.26 | 10.30 | 36.20 |
| govbalance | 571 | -3.27 | 3.86 | -15.38 | 7.82 |
| govliab | 471 | 59.76 | 30.09 | 7.95 | 168.09 |
| realgdp | 597 | 2.54 | 2.21 | -7.28 | 10.84 |
| unemp | 597 | 6.88 | 3.59 | 0.18 | 19.11 |
| infl | 597 | 5.80 | 5.52 | -5.57 | 33.06 |
| pop65 | 597 | 13.65 | 2.34 | 7.88 | 19.67 |
| ggini | 154 | 35.64 | 5.85 | 23.40 | 46.40 |
| ngini | 285 | 29.26 | 5.19 | 19.40 | 40.50 |
| disprop | 597 | 6.25 | 5.48 | 0.37 | 24.61 |

Table 11: Summary statistics II

| Variable | | Mean | Std.dev. | Min | Max | Observations |
|------------|---------|-------|----------|--------|--------|---------------|
| govexp | overall | 45.93 | 8.54 | 27.39 | 72.45 | N = 571 |
| | between | | 7.38 | 33.76 | 61.46 | n = 20 |
| | within | | 4.68 | 31.87 | 68.08 | T-bar = 28.55 |
| socexp | overall | 20.55 | 5.26 | 10.30 | 36.20 | N = 472 |
| | between | | 4.91 | 13.01 | 30.85 | n = 20 |
| | within | | 2.16 | 13.58 | 30.19 | T = 23.6 |
| govbalance | overall | -3.27 | 3.86 | -15.38 | 7.82 | N = 571 |
| | between | | 2.34 | -7.93 | 2.06 | n = 20 |
| | within | | 3.11 | -13.66 | 6.06 | T-bar = 28.55 |
| govliab | overall | 59.76 | 30.09 | 7.95 | 168.09 | N = 471 |
| | between | | 24.80 | 27.84 | 123.16 | n = 20 |
| | within | | 19.77 | -1.36 | 143.80 | T-bar = 23.55 |
| realgdp | overall | 2.54 | 2.21 | -7.28 | 10.84 | N = 597 |
| | between | | 0.80 | 1.25 | 5.24 | n = 20 |
| | within | | 2.07 | -6.22 | 9.01 | T-bar = 29.85 |
| unemp | overall | 6.88 | 3.59 | 0.18 | 19.11 | N = 597 |
| | between | | 2.71 | 1.82 | 13.11 | n = 20 |
| | within | | 2.46 | -2.08 | 16.44 | T-bar = 29.85 |
| infl | overall | 5.80 | 5.52 | -5.57 | 33.06 | N = 597 |
| | between | | 2.88 | 2.40 | 13.08 | n = 20 |
| | within | | 4.76 | -7.49 | 26.75 | T-bar = 29.85 |
| pop65 | overall | 13.65 | 2.34 | 7.88 | 19.67 | N = 597 |
| | between | | 1.85 | 10.81 | 17.11 | n = 20 |
| | within | | 1.49 | 8.93 | 20.27 | T-bar = 29.85 |
| ggini | overall | 35.64 | 5.85 | 23.40 | 46.40 | N = 154 |
| | between | | 4.81 | 27.44 | 42.81 | n = 17 |
| | within | | 2.40 | 27.84 | 40.85 | T = 9.06 |
| ngini | overall | 29.26 | 5.19 | 19.40 | 40.50 | N = 285 |
| | between | | 4.44 | 22.18 | 37.72 | n = 20 |
| | within | | 2.46 | 22.52 | 35.77 | T = 14.25 |
| disprop | overall | 6.25 | 5.48 | 0.37 | 24.61 | N = 597 |
| | between | | 4.84 | 0.97 | 16.02 | n = 20 |
| | within | | 2.75 | -3.21 | 15.53 | T-bar = 29.85 |

| Variables | govexp | socexp | govbalance | govliab | realgdp | unemp | infl | pop65 | ggini | ngini | disprop |
|------------|--------|--------|------------|---------|---------|--------|--------|--------|--------|-------|---------|
| govexp | 1.000 | | | | | | | | | | |
| socexp | 0.855 | 1.000 | | | | | | | | | |
| govbalance | -0.228 | 0.033 | 1.000 | | | | | | | | |
| govliab | 0.326 | 0.222 | -0.403 | 1.000 | | | | | | | |
| realgdp | -0.266 | -0.231 | 0.207 | -0.064 | 1.000 | | | | | | |
| unemp | 0.196 | 0.142 | -0.362 | 0.291 | 0.085 | 1.000 | | | | | |
| infl | -0.170 | -0.290 | -0.307 | -0.335 | -0.132 | -0.078 | 1.000 | | | | |
| pop65 | 0.490 | 0.630 | 0.057 | 0.401 | -0.174 | 0.013 | -0.390 | 1.000 | | | |
| ggini | -0.383 | -0.448 | -0.177 | -0.083 | 0.220 | -0.084 | -0.104 | -0.177 | 1.000 | | |
| ngini | -0.646 | -0.672 | -0.312 | 0.017 | 0.174 | 0.175 | 0.060 | -0.258 | 0.733 | 1.000 | |
| disprop | -0.252 | -0.226 | -0.053 | -0.091 | 0.036 | 0.215 | 0.085 | -0.174 | -0.009 | 0.247 | 1.000 |

Table 12: Cross-correlation table

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