Fiscal performance and income inequality: Are unequal societies more deficit-prone? Some cross-country evidence

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Abstract

A bias towards running deficits is an entrenched feature of fiscal policy making in most developed economies. Our paper examines whether this tendency is in any way associated with the personal distribution of income of a country. It takes inspiration from theoretical work according to which distributional conflicts may give rise to deficit spending or to delayed fiscal adjustment. Although these theories have been around for years the empirical literature on the determinants of fiscal performance has so far paid little or no attention to the possible role played by different degrees of income inequality. Our results suggest that this neglect was not justified. Using cross-country data we find evidence that a more unequal distribution of income can weigh on a country's fiscal performance. These findings can be relevant in the aftermath of the post-2007 global financial and economic crisis in particular when designing fiscal exist strategies. The success and sustainability of such strategies may *inter alia* depend on their distributional implications.

1. Introduction

Since the 1970s, fiscal policy making in a large number of OECD economies has run afoul of one central prediction of Barro's tax smoothing paradigm (1979), namely that budget balances would even out over time. Persistent deficits in peacetime, which over the years accumulated to sizeable levels of government debt, have become an entrenched feature of fiscal policy. On the back of these developments, a rich political economy literature has developed examining the determinants of fiscal profligacy. An early and comprehensive review of the respective branch of the literature is by Alesina and Perotti (1995).

Among the competing models that seek to explain the persisting deficit bias two dominate the empirical literature and the political debate: fiscal illusion and geographically or other wise dispersed interests. Fiscal illusion, which includes the issue of political business cycles, essentially assumes that voters do not grasp that deficits will have to be financed by future tax increases or expenditure cuts. The model of dispersed interests is somewhat more involved. It is an application of the 'fishing-from-a-common-pool' problem, where political representatives, when assessing spending proposals, consider only the costs and benefits for their respective constituency ignoring the effect on the overall tax burden: the aggregate result is overspending. By now, the 'common pool' problem has become the main starting point of the growing strand of the literature examining ways to tackle the deficit bias. One of the first and particularly active scholars to empirically investigate the interaction between the 'common pool' problem oin public finances and institutional arrangements is von Hagen and his co-authors (see for instance von Hagen, 1992, von Hagen and Harden, 1994, and von Hagen and Poterba, 1999).

Explanations other than the fiscal illusion and 'common pool' problem, in particular distributional conflicts and intergenerational redistribution, which are part of the standard repertoire of the political economy of the budget deficit, have, to our knowledge, inspired

comparatively little or no empirical work. Our paper ventures into this less travelled road of the empirical literature and investigates the link between fiscal performance and income inequality. The basic idea underlying the models on which we stage our work is that political 'struggles' between different social groups, including the 'poor' and the 'rich', can delay fiscal adjustment towards balanced budgets and/or lead to the accumulation of debt to be born by future generations.

Possible reasons why distributional conflicts and intergenerational distribution have so far received relatively little attention in the empirical literature dealing with the political economy of the budget deficit include: (i) data on income distribution are less readily available and potentially less reliable than other macroeconomic indicators; (ii) the relationship between income distribution and fiscal performance is likely to be complex in the sense that income inequality as such may not necessarily lead to overspending; rather it may involve a number of interactions with other variables such as political institutions; and (iii) more generally and importantly, issues of income distribution have for a long time been marginalized in mainstream economics. Only recently, after decades of increasing inequality of income in some developed countries and a visibly skewed distribution of income gains generated in boom periods - such as the ITC boom in the second half of the 1990s as well as the expansion of the financial industry up until the onset of the post-2007 global financial and economic crisis - the public eye and the economic profession are gradually rediscovering the personal distribution of income as a relevant economic issue. To take an example from the public debate that is particularly close to the topic of our paper, the view that income distribution may feed back onto fiscal policy was also hypothesised in the financial press.[1]

Against this background, our empirical analysis concentrates on the relationship between fiscal performance and income inequality. Our prior is that income inequality may give rise to stronger distributional conflicts which in turn can lead to some kind of 'soothing' increase

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[1] *'There is little evidence that inequality affects the societies' desire for redistribution at the ballot box. However, there is evidence that if those in the middle of the income distribution feel greater affinity with the poor, democracies tend to vote for more redistribution';* Chris Giles in Financial Times, 16 December 2009, FT.COM: Social scars from an unequal crisis.

in spending unmatched by revenue increases. The results of our analysis warrant conclusions that complement the conventional lessons about how to deal with the deficit bias. In fact, we find evidence that income inequality can weigh on public finances through various channels. For instance, income inequality seems to dampen the effect of economic growth on the budget. As a result, income inequality can hamper fiscal discipline and adjustment.

Admittedly, we do not expect distributional conflicts or income distribution to be the dominant determinant of the deficit bias or for that matter to be more important than the 'common pool' problem. However, we argue that the distribution of income can and is playing a significant role, a role that so far has been overlooked and that is likely to be of importance for ongoing and prospective fiscal adjustment processes aimed at correcting the dismal and unsustainable fiscal situation that has build up in the wake of the Great Recession.

The remainder of our paper is organized as follows. Section 2 reviews models in the political economy literature that postulate or imply that distributional conflicts or income inequality may lead to excessive spending and to an accumulation of debt. Section 3 describes our data set, including five different sources of inequality measures. Section 4 discussed the results of our empirical analysis which is divided into two parts. The first part, based on a simple analysis of variance, presents a number of stylized facts concerning fiscal performance, political institutions, social conflicts and income distribution. The second part reviews the results of panel regressions examining the link between fiscal performance as measured by the budget balance to GDP ratio and indicators of personal income distribution while controlling for other possible determinants of the budget balance. Section 5 discusses policy implications of our empirical findings and concludes.

2.   The political economy of the budget deficit: the role of distributional conflicts

As highlighted eloquently by Atkinson (1997), the analysis of personal income distribution has for a long time not been at the core of main stream or modern neoclassical economics: it was, to use his own words, out in the cold. Allocation and efficiency have 'naturally'

dominated the focus of attention. Income inequality was largely considered to be a social or political issue. The only area of modern neoclassical economics that has consistently addressed issues of income distribution is growth theory, and related to that, development economics. A particularly striking piece of evidence for the relative neglect of main-stream economics vis-à-vis income inequality is that none of the widely used macroeconomic textbooks on the market features sections on the possible interactions between income distributions and key macroeconomic variables.

Nonetheless, there is one branch of the economic literature, where the distribution of income has typically featured somewhat more prominently: public choice or political economy. The analysis of how the interplay between conflicting interests and collective decision making shapes economic outcomes includes models where the heterogeneity across individuals is in the level of income. These models examine how varying degrees of income inequality can affect economic policy making and, in turn, economic outcomes. Overall, the variety of political economy models involving income distribution can be divided into two broad groups.

The first focuses on the redistribution of pre-tax income via the political process. The key questions addressed by this class of models is when and how the political process generates tax and transfer programs that lead to a re-distribution of income across the currently alive generations, typically but not necessarily, from the rich to the poor. Prominent examples are Meltzer and Richards (1981) and Dixit and Londregan (1996). One prime conclusion of this type of research is that an unequal income distribution (as measured by the median voter's relative income) will produce the necessary political majority in favour of redistributive expenditure and tax programmes; more specifically, the more unequal the distribution of income the higher the level of redistributive spending.

Obviously, redistribution *per se* does not necessarily entail fiscal profligacy, as governments can well implement redistribution with balanced budgets. However, there is a possible interaction between the degree of redistribution and economic growth that may make the balancing of the budget more difficult when redistribution is large. In particular, Bertola (1993) and Person and Tabellini (1994) have, among others, argued that redistributive spending will affect growth because of the distortive effect of taxation and

the crowding out of investment. On this basis, one could reasonably hypothesise that in a more unequal society with higher demand for redistributive spending lower economic growth may complicate the government process aimed at accommodating competing claims on the budget as compared to a more equal society with lower redistributive spending and higher growth.

In the second group of political economy models involving income inequality the focus is less on the determinants of traditional redistributive policies. Rather, the heterogeneity across individuals in the level of income represents an element that may affect macro outcomes, including fiscal performance. Very often the main difference compared to the first group of models is an intergenerational dimension where income inequality can lead to redistribution from living to future generations by running government deficits and accumulating debt.

Cuckierman and Meltzer (1989), for instance, developed a framework where poor and liquidity constrained households want to run government deficits while rich households can adjust their economic plans to any fiscal policy profile. In a similar vein, Tabellini (1991) proposes a setup where debt is accumulated because future generations are not present when new government debt is issued. Government debt is nonetheless honoured because the old and the children of the wealthy (who hold a large quantity of the debt) chose to do so.

Beyond the intergenerational framework, distributional conflicts can affect fiscal performance also by delaying necessary reforms. It is a fact of modern political life that a multitude of social and political constraints hampers and defers the implementation of reform programs, such as fiscal consolidation, even when the economic case is clear and compelling. One of the main and, after all, evident findings of the relatively rich literature on inaction and delay is that procrastination is a function of how the costs of reform are distributed: the more unequal the distribution of the costs of reform the stronger the resistance to change. This point is for instance made by Alesina and Drazen (1991) in connection with fiscal stabilization. Using a war of attrition model, they show that (i) struggles among social groups over the distribution of the required fiscal adjustment delays the consolidation effort and (ii) the delay increases if the consolidation programme is

'inequitable'. Distributional aspects feature even more prominently in the model of delayed fiscal stabilisation by Hsieh (1997) where 'workers' bargain with 'capitalists' over the respective share of the adjustment costs.

In spite of the relatively rich theoretical political economy literature involving issues of income distribution or distributional conflicts there are, to our knowledge, very few empirical studies examining in a systematic way the possible link between income distribution and fiscal policy performance. In the empirical macro literature, the distribution of personal income has, together with a plethora of other candidates, been mainly examined as potential determinant of economic growth in cross-country growth regressions. A useful review of that type of research, which boomed in 1990s, and unambiguously concluded that inequality reduces economic growth, is provided in Aghion et al. (1999).

Empirical studies closer to the economic policy models discussed above do exist but generally try to establish whether and how income inequality affects the size of government or the composition of government expenditure; see for instance Perotti (1996). By contrast, the question of whether inequality may lead to higher deficits and, in turn, to a stronger accumulation of debt has not been investigated so far.

3. Our dataset(s)

Our dataset covers over 30 middle-income and industrial countries, mostly OECD members, over the period 1960-2008 and comprises three different types of data: data on income inequality, national accounts including fiscal variables and data on political and societal institutions. The choice of countries was essentially dictated by the availability of public finance data. The list of countries considered in our study and a detailed description of all the variables used, including their respective source, is provided in the Annex.

While quality is a pervasive issue with all kinds of data, it is thought to be particularly severe for measures of the personal distribution of income. Reflecting, among other things, the relative inattention devoted to the subject of income distribution by the economic profession and, more generally, by politics in developed countries, there is no commonly agreed methodological basis for the construction of distribution data. In spite of some recent progress in the EU and the OECD, the availability of comparable data is still limited.

All existing secondary datasets covering a sufficiently long period of time and a sufficiently large cross-section of countries suffer, to varying degrees, from the same type of caveat: the comparison of income inequality across time and countries is hampered by methodological breaks, differences in coverage, units of reference and or/income concept. The corresponding pitfalls have been examined in the literature; for a very comprehensive discussion see Atkinson and Brandolini (2001).

Our approach to dealing with the likely quality issues of distribution data is to carry out our empirical analysis for a series of common and readily available secondary data sets, in particular, the 2008-update of the UNU-WIDER database, the data-set constructed by Deininger and Squire (1996), figures from the Luxembourg Income Study (LIS), the OECD and EUROSTAT.

Evidently, the main idea of our approach is to check the robustness of our results across alternative sources of distribution data. This tactic may not be fail-safe, as alternative data sources may share common problems. However, it gives us a higher degree of confidence compared to existing studies involving distribution data that rely on one secondary data source only.

Among the alternative measures of income inequality (Gini coefficient, quintile, decile, or percentile group shares) we concentrate on the Gini-coefficient as it offers the broadest coverage across time and countries across the different sources considered. The exception is the OECD dataset where the 9th to the 1st decile ratio allows for a larger coverage compared to the Gini-coefficient.[2]

The availability of Gini coefficients within the individual datasets is uneven both across time and countries, especially in the 1960s, the 1970s and, to some extent, also in the 1980s. Consecutive annual figures are generally available only from the early 1990s onward. A detailed description of the time and cross-section dimension of the different distribution datasets is provided in the Annex.

The by far most comprehensive set of figures is the one provided by the 2008-update of the UNU-WIDER project. For the 35 countries considered in our study it offers more than 2300

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[2] The decile ratio measures average income of decile i in terms of average income of decile j.

Gini estimates over the period 1960-2008. The large number of observations is explained by the fact that UNU-WIDER collects estimates from a whole variety of different sources, which means that in many years more than one estimate per country is provided. Hence, when constructing our panel we had to discriminate among the available figures for individual years. As the source of the alternative estimates changes across time, within countries and across countries our choice could only be heuristic. Nevertheless, we followed the following principle: whenever possible we chose estimates that are based on disposable income, for which households are the recipient unit and that provide for a full coverage of the population. No selection of alternative estimates was necessary for the other distribution datasets, as they provide only one inequality measure for a given year in a given country.[3]

Surprisingly or not, the inequality measures from different sources tend to be strongly correlated. Except for the OECD decile ratios, cross-correlations are close or above 0.8. The relatively weak co-movement of the decile ratios with respect to the Gini coefficients may be explained by the fact that (i) the former capture only a part of the distributional spectrum while the latter represents a synthetic measure of the entire distribution and (ii) the income concept underlying the decile ratios is gross earnings of employees as opposed to disposable income of all households for the other four datasets.

4. Empirical analysis

Our empirical analysis aimed at testing the link between fiscal performance and personal income distributions proceeds in two steps. We first take a preliminary look at the data performing some simple statistical inference to find out whether countries with an, on average, more uneven distribution of income exhibit statistically significant differences with regard to a selection of fiscal and political variables compared to countries with a more even distribution of income.

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[3] This is not entirely true for the Deininger Squire (1996) set, which in some cases offers multiple estimates for a given year and country. However, the 'over-determination' can be avoided by selecting the estimates marked as 'accept' indicating a high data quality.

After that we proceed to a more involved statistical examination of how a country's personal distribution of income may impact on fiscal performance controlling for a range of other potential determinants of fiscal performance and possible interactions among them.

Analysis of variance: comparing means

An admittedly crude but still useful way to commence our empirical examination is a one-way analysis of variance (ANOVA). To that end we first divide our sample(s) into two groups using the average Gini coefficient as discriminators. We then compare means across the groups to check whether they exhibit statistically significant differences with respect to the variables of interest. For the sake of convenience, the variables of interest are divided into three groups: fiscal variables, political/institutional variables and measures of the degree of conflict. The full list is provided in the tables below.[4]

Table 1: Equal versus unequal distribution of income - comparing means

UNU-WIDER inequality measures (Gini coefficients)
1960-2008

| Code | Variables | Gini above average | | Gini below average | | | Test for equality |
		Mean	Count	Mean	Count	Total	prob. Value
BB	Budget balance (% of GDP)	-2.64	172	-1.94	376	548	0.08
SS	Social spending (% of GDP)	13.80	119	16.27	313	432	0.00
DEBTR	General government debt (%of GDP)	52.99	195	58.84	342	537	0.02
EXECRR	Political orientation of government (1=right, 0=centre-left)	0.53	241	0.38	418	659	0.00
MAJ	Margin of majority	0.52	227	0.59	433	660	0.00
GOVSP	Largest party of government with special interests (Dummy)	0.04	254	0.14	450	704	0.00
HERFGO	Herfindhal index of government	0.79	227	0.68	433	660	0.00
LEGEL	Economic freedom (index)	0.27	253	0.27	435	688	0.99
FR	Legislative elections (Dummy)	0.21	81	0.10	243	324	0.42
ECOFR	Fiscal rules (index)	6.41	259	6.77	427	686	0.00
BNKV1052	Number of anti-government demonstrations	1.14	307	0.72	449	756	0.01
SFTPUHVL	Number of major political crises, conflicts	1.42	307	0.46	454	761	0.00
STABS	Number of veto players leaving office	0.13	229	0.13	426	655	0.80

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[4] A more detailed description of all the non-fiscal variables used in the empirical analysis, including their source, is provided in the Annex.

Deininger and Squire (1997) inequality measures (Gini coefficients - quality score=accept)
1960-1996

Code	Variables	Gini above average		Gini below average			Test for equality
		Mean	Count	Mean	Count	Total	prob. Value
BB	Budget balance (% of GDP)	-4.28	67	-3.39	71	138	0.23
SS	Social spending (% of GDP)	11.44	49	14.37	62	111	0.00
DEBTR	General government debt (%of GDP)	50.16	90	58.01	83	173	0.03
EXECRR	Political orientation of government (1=right, 0=centre-left)	0.57	96	0.36	115	211	0.00
MAJ	Margin of majority	0.54	89	0.65	115	204	0.00
GOVSP	Largest party of government with special interests (Dummy)	0.00	99	0.08	118	217	0.00
HERFGO	Herfindhal index of government	0.85	89	0.75	115	204	0.01
ECOFR	Economic freedom (index)	5.87	107	6.31	101	208	0.00
LEGEL	Legislative elections (Dummy)	0.31	98	0.29	117	215	0.81
FR	Fiscal rules (index)	-0.57	9	-0.79	19	28	0.43
BNKV1052	Number of anti-government demonstrations	1.07	118	1.27	154	272	0.50
SFTPUHVL	Number of major political crises, conflicts	0.38	118	1.22	154	272	0.01
STABS	Number of veto players leaving office	0.13	84	0.13	108	192	0.97

OECD inequality measures (decile ratios - D9/D1)
1970-2008

Code	Variables	Decile ratio above average		Decile ratio below average			Test for equality
		Mean	Count	Mean	Count	Total	prob. Value
BB	Budget balance (% of GDP)	-1.77	156	-1.54	216	372	0.55
SS	Social spending (% of GDP)	13.61	140	17.72	185	325	0.00
DEBTR	General government debt (%of GDP)	47.90	174	60.40	213	387	0.00
EXECRR	Political orientation of government (1=right, 0=centre-left)	0.49	158	0.51	232	390	0.77
MAJ	Margin of majority	0.54	159	0.55	238	397	0.15
GOVSP	Largest party of government with special interests (Dummy)	0.01	162	0.10	240	402	0.00
HERFGO	Herfindhal index of government	0.86	159	0.62	238	397	0.00
ECOFR	Economic freedom (index)	6.57	178	6.70	204	382	0.21
LEGEL	Legislative elections (Dummy)	0.31	162	0.27	240	402	0.44
FR	Fiscal rules (index)	0.15	65	0.51	107	172	0.03
BNKV1052	Number of anti-government demonstrations	1.65	109	0.46	206	315	0.00
SFTPUHVL	Number of major political crises, conflicts	1.19	109	0.27	206	315	0.00
STABS	Number of veto players leaving office	0.10	157	0.14	234	391	0.09

Luxembourg income study inequality measures (Gini coefficients)
(1967-2005)

Code	Variables	Gini above average Mean	Count	Gini below average Mean	Count	Total	Test for equality prob. Value
BB	Budget balance (% of GDP)	-2.62	*54*	-1.67	*71*	*125*	0.23
SS	Social spending (% of GDP)	11.59	*48*	18.18	*61*	*109*	0.00
DEBTR	General government debt (%of GDP)	62.30	*43*	58.20	*71*	*133*	0.51
EXECRR	Political orientation of government (1=right, 0=centre-left)	0.39	*62*	0.41	*83*	*145*	0.79
MAJ	Margin of majority	0.54	*64*	0.57	*86*	*150*	0.12
GOVSP	Largest party of government with special interests (Dummy)	0.02	*65*	0.18	*88*	*153*	0.00
HERFGO	Herfindhal index of government	0.79	*64*	0.59	*86*	*150*	0.00
ECOFR	Economic freedom (index)	7.01	*64*	6.88	*79*	*143*	0.40
LEGEL	Legislative elections (Dummy)	0.23	*65*	0.25	*87*	*152*	0.75
FR	Fiscal rules (index)	-0.32	*23*	0.13	*43*	*66*	0.09
BNKV1052	Number of anti-government demonstrations	1.08	*50*	0.99	*85*	*135*	0.83
SFTPUHVL	Number of major political crises, conflicts	2.46	*50*	0.19	*81*	*131*	0.01
STABS	Number of veto players leaving office	0.15	*64*	0.08	*85*	*149*	0.09

EUROSTAT inequality measures (Gini coefficients)
1995-2008

Code	Variables	Gini above average Mean	Count	Gini below average Mean	Count	Total	Test for equality prob. Value
BB	Budget balance (% of GDP)	-2.02	*110*	0.02	*129*	*239*	0.00
SS	Social spending (% of GDP)	16.28	*94*	19.70	*116*	*210*	0.00
DEBTR	General government debt (%of GDP)	73.30	*96*	58.40	*119*	*215*	0.00
EXECRR	Political orientation of government (1=right, 0=centre-left)	0.40	*86*	0.32	*99*	*185*	0.31
MAJ	Margin of majority	0.54	*92*	0.57	*101*	*193*	0.08
GOVSP	Largest party of government with special interests (Dummy)	0.13	*92*	0.23	*101*	*193*	0.08
HERFGO	Herfindhal index of government	0.80	*92*	0.52	*101*	*193*	0.00
ECOFR	Economic freedom (index)	7.28	*93*	7.02	*102*	*195*	0.01
LEGEL	Legislative elections (Dummy)	0.26	*92*	0.24	*101*	*193*	0.71
FR	Fiscal rules (index)	0.23	*107*	0.75	*119*	*226*	0.01
BNKV1052	Number of anti-government demonstrations	0.55	*62*	0.24	*116*	*116*	0.09
SFTPUHVL	Number of major political crises, conflicts	0.46	*61*	0.00	*48*	*109*	0.32
STABS	Number of veto players leaving office	0.17	*92*	0.09	*101*	*193*	0.04

The results of the means comparison, which on the whole do not include big surprises, can be summarised as follows. As regards fiscal policy, the key thing to note is that countries with a lower-than-average score of income inequality tend to record lower budget deficits and a higher share of social spending in total government expenditure. This result is consistent for all the sources of distribution data considered, but the difference concerning the budget deficit is not always statistically significant.

Turning to political factors, we find that an above-average degree of income inequality tends to be associated with a prevalence of governments from the right, with a stronger degree of political concentration in government, and with governments that represent a wider spectrum of interests.

The mean comparison based on the index of Economic Freedom is less conclusive. For three out of the five data sources a lower-than average degree of income inequality is associated with a higher score of economic freedom; in two cases it is the other way round.

A somewhat clearer picture emerges with respect to measures of political instability. The number of anti-government protests or the number of major political crises/conflicts or both turn out to significantly discriminate between countries with a below or above average inequality score. Specifically, political instability is more frequent in more unequal societies.

Panel regressions

The distribution and redistribution of income involve complex economic, social and political processes. In the following we do not pretend to unveil the intricacies and details of how different degrees of inequality may affect aggregate fiscal performance. Our aim is to throw light on a number of aggregate channels associated with the predictions of the theoretical literature reviewed above. More specifically, we take a look at the following set of issues/questions:

(i) Does inequality always produce pressure on public finances or does it work via a specific political affiliation of government? This question is based on the presumption that inequality is likely to interact with prevailing political constellations or prevailing societal values: societies where a majority trusts in the virtues and opportunities of the free market may tend to accept a more unequal distribution of income and pursue fiscal discipline as opposed to societies where a majority accepts the need to correct market outcomes through fiscal policy interventions, including through deficit spending.

(ii) Does political or social instability play a role? In this case the underlying consideration is rather straightforward. A more unequal distribution of income can be assumed to translate into a deterioration of the government's fiscal balance when

combined with political instability. Faced with 'pressure from the streets' policy makers may be inclined to respond by running deficits. By contrast, an unequal distribution of income coupled with political stability may allow for a more reasoned fiscal policy.

(iii) To the extent that inequality matters for fiscal performance, what is the interaction with economic growth? Does a more unequal distribution have a systematic effect on how additional public resources generated by economic growth impact on the budget balance? Conceivably, governments facing a more unequal distribution of income may find it more difficult to entirely assign additional revenues to the improvement of public finances.

We approach these issues/questions by running reduced-form panel regressions using the following class of specifications.

$$(1) \qquad b_{i,t} = c_i + \alpha \, b_{i,t-1} + \sum_j \beta_j x_{ij,t} + \gamma \, z_{i,t} + \sum_j \gamma_j x_{ij,t} z_{i,t} + \varepsilon_{i,t}$$

$b_{i,t}$ measures the budget-balance-to-GDP ratio of country i in year t, $x_{ij,t}$ stands for the realisation of explanatory variable j of country i in year t, $z_{i,t}$ denotes the measure of income inequality, i.e. the Gini coefficient or the decile ratios, and $\varepsilon_{i,t}$ represents an independent and identically-distributed random effect. The country-specific constant c_i captures country-fixed effects.

The explanatory variables x and z enter equation (1) in two different ways: in an additive and a multiplicative fashion. The additive terms $\sum_j \beta_j x_{ij,t} + \gamma \, z_{i,t}$ are meant to capture the individual effects on fiscal performance whereas the multiplicative terms $\sum_j \gamma_j x_{ij,t} z_{i,t}$ are expected to capture likely interactions notably between inequality z and other determinates of fiscal performance x. Interaction terms can be interpreted as kind of slope dummies where the effect an explanatory variable x brings to bear on the independent variable depends on a third mediating factor. In our case this mediating factor of interest is the distribution of income.

The total effect of a variable x_j on fiscal performance as measured by the budget-balance-to-GDP ratio b_i can be written as $(\beta_j + \gamma_j z_{i,t}) x_{ij,t}$ where on top of the direct effect captured by the coefficient β_j there is a second component $\gamma_j z_{i,t}$ the size of which depends on the measure of income distribution.[5]

In concrete terms, our specification strategy is the following. We start with a set of equations where explanatory variables, including the measure of inequality, are introduced individually, that is without interactions. These equations can be termed as 'conventional fiscal reaction functions' that are very common in the literature (see for instance Bohn, 1998, Ballabriga and Martinez-Mongay, 2002 and Gali and Perotti, 2003). As a second step we augment our equations with interaction terms to see whether the distribution of income has an impact on fiscal performance in combination with other variables, as hypothesised above. All our panels are estimated by Generalised Least Squares (GLS) with country fixed effects.

The results of our first battery of panel regressions are summarised in Table 2, which is divided into five sections. Each section refers to one of the alternative sets of distribution data discussed in Section 3 (i.e. UNU-WIDER, Deininger and Squire (DS), LIS, OECD and EUROSTAT). The number of observations and the time period are not constant across specifications. They are a function of the availability of the distribution data which varies considerably across sources.

On top of the inequality measure (i.e. Gini coefficient or decile ratio) our choice of explanatory variables was mainly inspired by the existing empirical literature which has established a number of factors that turned out to play a statistically significant role across different studies, such as fiscal and cyclical conditions as well as political and institutional

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[5] The main difference compared to actual slope dummies is that the moderating or accelerating factor z is not a binary but a metric variable.

features of a country, including elections and fiscal rules.[6] A detailed definition of the political and institutional variables used in our regression analysis is provided in the Annex.

The lagged dependent variable is mainly included for econometric reasons, so as to capture the considerable degree of inertia in the budget balance, and should not be interpreted as capturing the state of public finances *strictu sensu*. Ideally, one would like to assess prevailing fiscal conditions by means of the debt-to-GDP ratio and possibly expect a negative relationship in the sense that a higher degree of indebtedness may induce policy makers to reduce the deficit in order to safeguard the long-term sustainability of public finances. However, comparable figures of gross liabilities of general government are fairly limited across both time and countries. They are reasonably complete to be included in regressions with the inequality measures from the LIS, OECD and EURSTAT dataset, yet do not yield convincing results. The estimated coefficient is not statistically significant, and in two out of three cases has an algebraic sign (positive) that conflicts with our prior.

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[6] Examples of this growing body of the empirical literature are Ballabriga and Martinez-Mongay (2002), Buti and van den Noord (2003), Gali and Perotti (2001), Manasse (2006) and European Commission (2006).

Table 2: Panel regressions – no interactions terms

Unbalanced panels. GLS estimation with country fixed effects and White cross-section weights.

Dependent variable: budget balance-to-GDP ratio

	UNU-WIDER			D&S		LIS			OECD[1]				EUROSTAT	
						Sets of distribution data								
b(-1)	0.73	0.51	0.51	0.66	0.77	0.75	0.78	0.72	0.62	0.65	0.72	0.72	0.45	0.48
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
DEBTR(-1)	-	-	-	-	-	-	0.02	-	-	0.02	-	0.01	-0.02	-
	-	-	-	-	-	-	(0.32)	-	-	(0.27)	-	(0.51)	(0.21)	-
GINI(-1)	-0.07	-0.15	-0.15	-0.01	-0.01	-0.04	-0.09	-0.06	1.76	2.95	1.22	1.51	-0.06	-0.06
	(0.01)	(0.22)	(0.20)	(0.97)	(0.92)	(0.86)	(0.66)	(0.84)	(0.13)	(0.14)	(0.02)	(0.01)	(0.45)	(0.49)
dlog(GDP)	33.48	33.68	33.29	37.38	33.83	46.50	43.92	45.38	38.39	40.88	43.17	46.61	41.27	37.52
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
dlog(GDP(-1))	-	-	-	-	-	-	-	-	-	-	-	-	-	20.85
	-	-	-	-	-	-	-	-	-	-	-	-	-	(0.04)
ECOFR	0.91	1.41	1.42	0.40	-	-	-	-	-	-	-	-	-	-
	(0.00)	(0.01)	(0.01)	(0.27)	-	-	-	-	-	-	-	-	-	-
FR	-	0.54	0.55	-	-	0.52	0.49	0.49	0.63	0.57	-	-	0.33	0.38
	-	(0.04)	(0.04)	-	-	(0.13)	(0.22)	(0.45)	(0.00)	(0.02)	-	-	(0.16)	(0.06)
LEGEL	-0.39	-0.61	-0.66	-0.46	-0.27	-0.28	-0.09	-0.82	-0.51	-0.51	-0.38	-0.39	-0.89	-0.89
	(0.09)	(0.04)	(0.04)	(0.18)	(0.49)	(0.64)	(0.88)	(0.12)	(0.14)	(0.12)	(0.07)	(0.05)	(0.00)	(0.00)
EXECRR	0.27	0.75	0.75	0.30	0.46	0.27	0.48	0.44	0.52	0.80	0.08	0.19	-	-
	(0.27)	(0.03)	(0.04)	(0.56)	(0.47)	(0.22)	(0.35)	(0.19)	(0.08)	(0.02)	(0.68)	(0.38)	-	-
EXECRR(-1)	-	-	-	-	-	-	-	-	-	-	-	-	0.53	0.48
	-	-	-	-	-	-	-	-	-	-	-	-	(0.02)	(0.04)
BNKV1052	-0.07	-0.23	-0.24	-0.07	-0.06	-	-	-0.25	-	-	-	-	-	-
	(0.27)	(0.00)	(0.00)	(0.64)	(0.68)	-	-	(0.22)	-	-	-	-	-	-
STABS	-	-	-0.33	-	-0.10	-	-	-	-	-	-	-	-	-
	-	-	(0.63)	-	(0.87)	-	-	-	-	-	-	-	-	-
Number of observations	326	165	165	99	102	60	51	53	146	138	329	304	146	158
Durbin-Watson statistic	2.00	2.15	2.12	1.98	2.06	1.33	1.07	1.42	2.45	2.57	2.09	2.16	2.11	2.21

Notes: (1) for OECD the inequality measure is the decile ratio (D9/D1). Numbers in brackets are p-values.

Depedenent variables: b=budget balance-to-GDP ratio; DEBTR= government debt-to-GDP ratio; ECOFR= index of economic freedom; FR= qulaity of fiscal rules (index); LEGEL= legislative election (dummy); EXECRR= political orientation of government (1=right, 0=centre-left); BNKV1052= number of anti-government protests; STABS=number of veto players stepping down. A more detailed description of the political variables is provided in the Annex.

Table 3: Panel regressions – no interaction terms

Unbalanced panels. GLS estimation with country fixed effects and White cross-section weights.

Dependent variable: budget balance to GDP ratio

	Sets of distribution data													
	UNU-WIDER			**D&S**		**LIS**			**OECD**[1]				**EUROSTAT**	
b(-1)	0.70	0.45	0.45	0.55	0.66	0.70	0.75	0.66	0.52	0.55	0.64	0.64	0.41	0.44
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
DEBTR(-1)	-	-		-	-	-	0.02	-	-	0.03	-	0.01	-0.01	-
	-	-		-	-	-	(0.47)	-	-	(0.18)	-	(0.60)	(0.40)	-
GINI(-1)	-0.05	-0.12	-0.12	0.03	0.01	0.08	-0.03	0.08	1.83	3.10	1.57	1.77	-0.01	-0.01
	(0.12)	(0.34)	(0.34)	(0.77)	(0.88)	(0.69)	(0.86)	(0.77)	(0.13)	(0.11)	(0.00)	(0.00)	(0.89)	(0.87)
dlog(GDP(-1))	18.59	25.04	24.76	34.66	33.82	29.19	31.98	26.21	36.35	37.53	30.96	32.84	35.42	30.22
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.04)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ECOFR	1.03	1.78	1.78	0.24	-	-	-	-	-	-	-	-	-	-
	(0.00)	(0.00)	(0.00)	(0.56)	-	-	-	-	-	-	-	-	-	-
FR	-	0.66	0.67	-	-	0.53	0.36	0.53	0.82	0.74	-	-	0.35	0.40
	-	(0.00)	(0.00)	-	-	-0.12	(0.35)	(0.38)	(0.00)	(0.00)	-	-	(0.21)	(0.10)
LEGEL	-0.29	-0.72	-0.73	-0.26	-0.14	-0.03	0.04	-0.66	-0.58	-0.55	-0.33	-0.37	-0.88	-0.84
	(0.31)	(0.03)	(0.04)	(0.44)	(0.71)	-0.96	(0.95)	(0.32)	(0.09)	(0.07)	(0.17)	(0.13)	(0.00)	(0.00)
EXECRR	0.16	0.63	0.16	-0.20	-0.035	0.5	0.11	0.15	0.70	0.97	0.13	0.22	-	-
	(0.53)	(0.04)	(0.53)	(0.74)	(0.96)	-0.32	(0.86)	(0.76)	(0.03)	(0.00)	(0.55)	(0.37)	-	-
EXECRR(-1)	-	-	-	-	-	-	-	-	-	-	-	-	0.32	0.30
	-	-	-	-	-	-	-	-	-	-	-	-	(0.01)	(0.02)
BNKV1052	-0.07	-0.28	-0.29	-0.02	-0.03	-	-	-0.24	-	-	-	-	-	-
	(0.29)	(0.00)	(0.00)	(0.86)	(0.85)	-	-	(0.31)	-	-	-	-	-	-
STABS	-	-	-0.12	-	-0.22	-	-	-	-	-	-	-	-	-
	-	-	(0.85)	-	(0.65)	-	-	-	-	-	-	-	-	-
Number of observations	323	163	163	98	101	60	51	53	146	138	329	304	146	158
Durbin-Watson statistic	2.04	2.29	2.28	1.78	1.88	0.99	1.32	0.92	2.44	2.57	2.02	2.05	2.09	2.19

Notes: (1) for OECD the inequality measure is the decile ratio (D9/D1). Numbers in brackets are p-values.

Dependent variables: b=budget balance-to-GDP ratio; DEBTR= government debt-to-GDP ratio; ECOFR= index of economic freedom; FR= quality of fiscal rules (index); LEGEL= legislative election (dummy); EXECRR= political orientation of government (1=right, 0=centre-left); BNKV1052= number of anti-government protests; STABS=number of veto players stepping down. A more detailed description of the political variables is provided in the Annex.

Table 4: Panel regressions – interaction terms

Unbalanced panels. GLS estimation with country fixed effects and White cross-section weights.
Dependent variable: budget balance to GDP ratio

	Set of distribution data															
	UNU-WIDER						D&S		LIS				OECD[1]		EUROSTAT	
b(-1)	0.78	0.78	0.49	0.73	0.73	0.43	0.70	0.62	0.83	0.83	0.83	0.83	0.71	0.71	0.47	0.42
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GINI(-1)	-0.01	-0.01	-0.01	-0.03	-0.02	-0.09	0.05	-0.01	0.19	0.19	0.06	0.07	1.66	1.67	0.07	0.02
	(0.76)	(0.80)	(0.88)	(0.32)	(0.34)	(0.28)	(0.47)	(0.93)	(0.12)	(0.13)	(0.63)	(0.61)	(0.07)	(0.01)	(0.44)	(0.73)
dlog(GDP)	72.98	73.37	96.02	88.64	89.28	105.42	26.09	24.59	81.35	82.29	95.13	97.15	79.66	79.76	96.14	45.04
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.03)	(0.64)	(0.71)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.17)	(0.58)
ECOFR	0.63	0.63	-	0.82	0.82	-	0.12	0.51	-0.03	-0.02	-0.17	-0.18	-	-	-	-
	(0.00)	(0.00)	-	(0.00)	(0.00)	-	(0.73)	(0.19)	(0.94)	(0.95)	(0.81)	(0.80)	-	-	-	-
FR	-	-	0.61	-	-	0.70	-	-	-	-	-	-	-	-	0.27	0.40
	-	-	(0.00)	-	-	(0.01)	-	-	-	-	-	-	-	-	(0.12)	(0.13)
LEGEL	-0.37	-0.37	-0.50	-0.31	-0.31	-0.47	-0.43	-0.35	-0.12	-0.12	-0.43	-0.45	-0.35	-0.36	-0.82	-0.70
	(0.07)	(0.07)	(0.03)	(0.20)	(0.21)	(0.10)	(0.09)	(0.27)	(0.77)	(0.78)	(0.38)	(0.38)	(0.12)	(0.10)	(0.00)	(0.02)
EXECRR	1.90	1.92	4.97	-	-	-	3.10	-	2.85	2.97	-	-	2.43	2.45	4.37	-
	(0.02)	(0.02)	(0.01)	-	-	-	(0.16)	-	(0.18)	(0.29)	-	-	(0.00)	(0.00)	(0.01)	-
EXECRR*GINI(-1)	-0.06	-0.06	-0.16	-	-	-	-0.10	-	-0.08	-0.08	-	-	-0.39	-0.39	-0.14	-
	(0.01)	(0.02)	(0.01)	-	-	-	(0.16)	-	(0.22)	(0.35)	-	-	(0.00)	(0.00)	(0.01)	-
BNKV1052(-1)	-	-	-	0.30	0.31	0.08	-	0.84	-	-	0.63	0.65	-	-	-	2.51
	-	-	-	(0.26)	(0.24)	(0.55)	-	(0.37)	-	-	(0.11)	(0.09)	-	-	-	(0.03)
BNKV1052(-1)*GINI(-1)	-	-	-	-0.01	-0.01	-0.01	-	-0.03	-	-	-0.02	-0.02	-	-	-	-0.08
	-	-	-	(0.27)	(0.25)	(0.00)	-	(0.29)	-	-	(0.08)	(0.06)	-	-	-	(0.04)
dlog(GDP)*GINI(-1)	-1.22	-	-	-1.75	-	-2.31	0.35	0.31	-1.77	-	-2.18	-	-12.52	-	-1.90	-0.21
	(0.00)	-	-	(0.00)	-	(0.11)	(0.82)	(0.86)	(0.01)	-	(0.01)	-	(0.10)	-	(0.37)	(0.93)
dlog(GDP)*GINI(-1)*DPG	-	-1.25	-	-	-1.79	-	-	-	-	-1.85	-	-2.33	-	-11.40	-	-
	-	(0.00)	-	-	(0.00)	-	-	-	-	(0.07)	-	(0.02)	-	(0.09)	-	-
dlog(GDP)*GINI(-1)*DNG	-	-1.17	-	-	1.69	-	-	-	-	-1.73	-	-2.10	-	-16.54	-	-
	-	(0.00)	-	-	(0.00)	-	-	-	-	(0.02)	-	(0.00)	-	(0.05)	-	-
Number of observations	434	434	249	360	360	192	117	102	111	111	96	96	329	329	157	115
Durbin-Watson statistic	1.99	1.99	1.75	2.10	2.10	1.58	1.89	2.00	0.91	0.91	0.85	0.83	2.08	2.08	2.22	2.26

Notes: (1) for OECD the inequality measure is the decile ratio (D9/D1). Numbers in brackets are p-values.

Dependent variables: b=budget balance-to-GDP ratio; ECOFR= economic freedom (index); LEGEL= legislative election (dummy); EXECRR= political orientation of government (1=right, 0=centre-left); FR=quality of fiscal rules (index); BNKV1052= number of anti-government protests; DPG= 1 if positive real GDP growth and 0 otherwise; DNP= 1 if negative real GDP growth and 0 otherwise. A more detailed description of the political variables is provided in the Annex.

Table 5: Panel regressions – interaction terms

Unbalanced panels. GLS estimation with country fixed effects and White cross-section weights.
Dependent variable: budget balance to GDP ratio

| | Set of distribution data | | | | | | | | | | | | | |
	UNU-WIDER						D&S		LIS		OECD[1]		EUROSTAT	
b(-1)	0.75	0.75	0.43	0.70	0.69	0.35	0.54	0.66	0.79	0.81	0.62	0.62	0.43	0.36
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
b(-2)	-	-	-	-	-	-	-	-0.09	-	-	-	-	-	-
	-	-	-	-	-	-	-	(0.59)	-	-	-	-	-	-
GINI(-1)	0.04	0.03	-0.06	-0.02	-0.01	-0.08	0.08	0.08	0.26	0.13	2.14	2.11	0.16	-0.02
	(0.27)	(0.28)	(0.48)	(0.66)	(0.69)	(0.42)	(0.26)	(0.34)	(0.02)	(0.23)	(0.00)	(0.0)	(0.08)	(0.91)
dlog(GDP(-1))	79.00	83.67	23.55	87.55	97.62	121.44	37.05	27.28	72.96	97.23	83.83	95.06	114.39	16.40
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.50)	(0.03)	(0.03)	(0.04)	(0.00)	(0.00)	(0.03)	(0.58)
ECOFR	0.75	0.72	-	0.96	0.94	-	-0.05	0.13	-0.02	-0.31	-	-	-	-
	(0.00)	(0.00)	-	(0.00)	(0.00)	-	(0.91)	(0.77)	(0.94)	(0.70)	-	-	-	-
FR	-	-	0.84	-	-	0.84	-	-	-	-	-	-	0.26	0.48
	-	-	(0.00)	-	-	(0.00)	-	-	-	-	-	-	(0.23)	(0.21)
LEGEL	-0.31	-0.33	-0.55	-0.23	-0.26	-0.61	-0.24	-0.36	-0.12	-0.14	-0.30	-0.27	-0.73	-0.88
	(0.18)	(0.14)	(0.03)	(0.38)	(0.30)	(0.04)	(0.28)	(0.10)	(0.78)	(0.78)	(0.21)	(0.26)	(0.00)	(0.00)
EXECRR	2.17	2.04	3.99	-	-	-	2.50	-	2.97	-	2.72	2.83	4.88	-
	(0.01)	(0.01)	(0.04)	-	-	-	(0.32)	-	(0.17)	-	(0.00)	(0.00)	(0.01)	-
EXECRR*GINI(-1)	-0.07	-0.07	-0.13	-	-	-	-0.09	-	-0.08	-	-0.43	-0.45	-0.16	-
	(0.01)	(0.01)	(0.04)	-	-	-	(0.26)	-	(0.21)	-	(0.00)	(0.00)	(0.02)	-
BNKV1052(-1)	-	-	-	-0.41	-0.56	0.09	-	2.07	-	-0.60	-	-	-	-0.04
	-	-	-	(0.16)	(0.14)	(0.91)	-	(0.09)	-	(0.27)	-	-	-	(0.98)
BNKV1052(-1)*GINI(-1)	-	-	-	0.01	0.02	-0.01	-	-0.08	-	0.02	-	-	-	-0.01
	-	-	-	(0.20)	(0.19)	(0.62)	-	(0.08)	-	(0.21)	-	-	-	(0.97)
dlog(GDP(-1))*GINI(-1)	-2.02	-	-	-2.40	-	-3.41	-0.19	-	-1.74	-2.66	-17.70	-	-2.81	0.44
	(0.00)	-	-	(0.00)	-	(0.02)	(0.91)	-	(0.11)	(0.12)	(0.03)	-	(0.10)	(0.86)
dlog(GDP(-1))*GINI(-1)*DPG	-	-2.12	-	-	-2.70	-	-	-	-	-	-	-20.69	-	-
	-	(0.00)	-	-	(0.00)	-	-	-	-	-	-	(0.01)	-	-
dlog(GDP(-1))*GINI(-1)*DNG	-	-2.82	-	-	-3.47	-	-	-	-	-	-	-29.84	-	-
	-	(0.00)	-	-	(0.01)	-	-	-	-	-	-	(0.00)	-	-
Number of observations	431	431	247	337	337	190	116	96	111	94	329	329	157	106
Durbin-Watson statistic	2.01	1.98	1.75	2.06	2.03	1.55	1.86	1.81	0.68	0.68	2.02	2.00	2.16	2.30

Our indicator of cyclical conditions - real GDP growth - is not standard. Most empirical studies examining the determinants of fiscal performance use output gap estimates, that is the difference between actual and potential output expressed in percent of potential GDP. However, output gap estimates are typically surrounded by a high degree of uncertainty. In particular, estimates available in real time, that is when governments adopt the budget, differ significantly from those available ex post, because they involve expectations about future output growth. As these forecasts are revised when actual data become available output gap estimates change. Such changes tend to be large and significantly alter the assessment of cyclical conditions. Forni and Momigliano (2004) have shown that ex-post output gap estimates have a weaker explanatory power than those underpinning actual fiscal policy decisions.

In spite of their superiority, the availability of real-time output gap estimates is generally limited in time. Sets of comparable real-time estimates for panel regressions, are available only since the mid-1990s. In light of this limitation we decided to use actual growth as a proxy for cyclical conditions.

Since fiscal policy can have an impact on the real level of economic activity, real GDP could be endogenous with respect to the fiscal balance and therefore bias our estimation results. To account for this possibility, we redo our complete set of regressions by replacing real GDP growth of year t with real GDP growth of the preceding year. Apart from addressing the endogeneity issue, using lagged real GDP growth as a proxy for cyclical conditions may have an additional advantage, as it may better reflect the actual dynamics of fiscal policy making. In particular, when preparing the budget for year t at the end of year t-1 decisions are likely to be influenced by the economic situation prevailing at that moment in time.

Also the inequality measure (Gini coefficient and decile ratio) enters our regression equations in lagged form. This is to account for a possible simultaneous feedback between fiscal policy and income distribution: changes in the budget balance in year t may have a contemporaneous redistributive effect.

Overall, the regression results relating to the basic specifications, i.e. without interaction terms, are not very conclusive as regards the role of income inequality. After controlling for other explanatory variables the estimated coefficient of the inequality measure has the expected negative sign across all datasets - except the one of the OECD which is based on pre-tax data – but is rarely statistically significant at conventional levels.

The results for the other explanatory variables confirm the findings in the literature and/or our priors. Real GDP growth is estimated to have a statistically significant and positive impact on the budget. More importantly, the size of the estimated coefficient(s) is broadly in line with the standard sensitivity of the government budget with respect to GDP, which, depending on the size of government, lies between around 0.3 and 0.5 (see Girouard and André, 2005). Moreover, we find somewhat weaker, although for some of the datasets still statistically significant, evidence indicating that (i) elections tend to weigh on the budget balance, (ii) that right wing governments are characterised by a higher degree of fiscal discipline (or lower degree of fiscal indiscipline) than centre-left government and (iii) that fiscal rules have a positive impact on fiscal performance. These results are consistent with Debrun et al. (2008) and with Buti and Van den Noord (2004). Finally, our results also suggest that more conflict, as measured by the number of anti-government demonstration, can translate into higher deficits or lower budget surplus. This would corroborate the archetypical idea that governments tend to open public coffers when put under pressure from the street.

Using lagged instead of contemporaneous real GDP growth as proxy for cyclical conditions does not alter the picture. The main conclusions derived from our first set of panel regressions are robust with respect to this change (see Table 3).

While not particularly encouraging per se, the weak evidence in favour of a direct negative relationship between fiscal performance and income inequality emerging from the basic specifications does not necessarily imply that such a relationship does not exist. As hypothesised above, it may simply be an indication that a purely additive arrangement of explanatory variable does not do justice to the more complex interplay between the distribution of income on the one hand and political and economic variables on the other.

This conjecture is corroborated by the regression results, reported in Table 4, relating to the more complex specifications explicitly allowing for interaction terms. They confirm a weak and statistically insignificant *direct* impact of the distribution of income on the budget balance, yet provide fairly robust evidence that income distribution can have an impact through more circuitous ways, in combination with other variables. The robustness of our results is strengthened by the fact, that our different sets of distribution data cover different time periods as well as slightly different groups of countries.[7]

To start with, we find an interesting interaction with the political colour of government. The preference for more fiscal discipline among right wing governments, which is confirmed by the estimated stand-alone coefficient of the respective dummy, weakens as the inequality of income rises. This is evidenced by the fact that the slope dummy capturing the interaction between a right wing government and the measure of income inequality has a negative algebraic sign and turns out to be statistically significant at standard confidence levels across most specifications and datasets. Taking the combined effect of the respective coefficients, our estimates would seem to suggest that income inequality can crowd out the relative preference of right wing governments for fiscal discipline when Gini coefficients rise above readings between 28 and 32. Interestingly, these values broadly corresponds to the average Gini coefficient in the datasets used in our study.

The appeal of this finding is twofold. First, it would seem to corroborate the intuition underlying the model by Cuckierman and Meltzer (1989) whereby increasing income inequality would give rise to political pressure favouring deficit spending. Second, it seems to be consistent with an interesting feature of the political debate that took place in the EU in the aftermath of the Great Recession. When faced with the need to design and implement incisive fiscal consolidation measures even right wing governments started thematising distributional issues.[8]

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[7] To 'iron out' possible breaks in the UNU-Wider series, we have also run regressions using moving averages of lagged Gini coefficients. The main findings turn out to be robust with respect to this adjustment.

[8] See for instance Le Monde of April 1, 2010, *Bouclier Fiscal: Nicolas Sarkozy face a' la fronde de la majorite'* and *Boomerang fiscal*.

The second revealing interaction relates to political (in)stability. Our regression results suggest that if paired with political instability as measured by the number of anti-government demonstrations, income inequality tends to weigh on the budget balance. The most likely interpretation of this result, which is fairly robust for the different sets of distribution data considered, is that income inequality does not translate into unfunded redistributive fiscal policies as long as the overall political situation is stable. In the face of political protests, however, income inequality seems to lead to higher deficits or lower surpluses most likely on the back of governments' attempts to calm the situation by handing out money to the less-well off.

Interestingly, and not surprisingly, this political economy interaction seems to be significant only for major instabilities. It is not confirmed when using indicators that capture less dramatic political changes such as the number of veto players (i.e. major institutional figures such as the prime minister or the president) that step down in a given year.

The amplified budgetary effect of political conflicts in combination with a higher degree of income inequality is lost when contemporaneous real GDP growth is replaced with its lagged value, i.e. when accounting for the likely endogeneity between economic growth and the budget balance. As is evident from Table 5, the respective interaction term mostly carries a positive algebraic sign and is not statistically significant. The direct channel, by contrast, is confirmed to be negative.

Although less eloquent than the stories associated with the previous two interactions, the third type of interaction emerging from our panel regressions is potentially more serious because more important in practice. In particular, we find that inequality tends to dampen the impact of economic growth on the budget balance. The coefficient of the interaction term capturing the interplay between inequality and real GDP growth is negative and in most cases statistically significant. This effect goes on top of those associated with the political affiliation of government and political instability.

As fiscal policy is often found to be asymmetric across the cycle (see for instance Balassone et al., 2008 and the European Commission, 2006) we have also tested separate dummies for positive and negative real GDP growth, the respective hypothesis being that

inequality dampens the effect of economic growth on the budget more during expansions than during contractions.[9] However, we do not find statistically significant evidence for this in the data. The hypothesis of equality of coefficients cannot be rejected at standard confidence levels.

Nevertheless, bearing in mind that years of positive economic growth are more frequent than years of contraction, the dampening effect of inequality on the budgetary sensitivity with respect to growth can have a significant impact over time. At the average reading of our Gini coefficients an increase in equality by one unit reduces the impact of GDP on the budget balance to GDP ratio by around 0.02 percentage points. For purely illustrative purposes, and using real GDP growth of the euro area, Figure 1 simulates the cumulated effect of real GDP growth on the budget balance for three different degrees of income inequality: a Gini coefficient of 28, which is about the average in our different data sources, and two alternative values of 33 and 25.[10]

Figure 1: Cumulated effect of economic growth on the budget balance for different degrees of income inequality.

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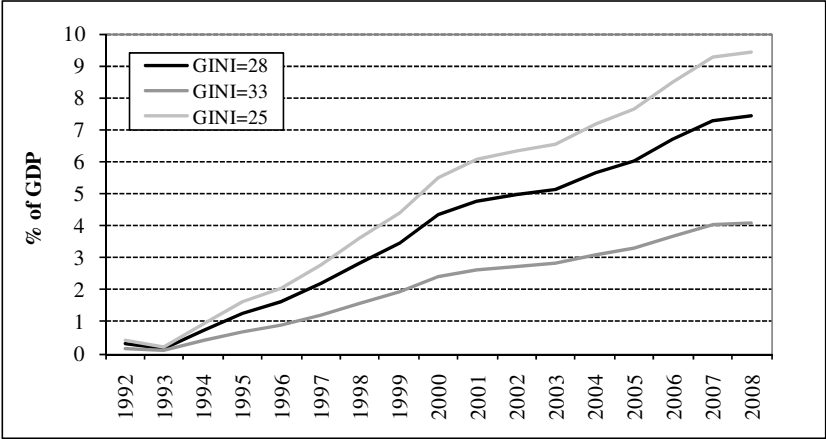
[9] The asymmetric behaviour over the cycle in combination with income inequality cannot be implemented for distribution data of EUROSTAT as the matrix of regressors including the respective dummies is not well defined.

[10] Examples of countries with a GINI of 25 or less are Austria, Sweden and Norway. Examples of countries with a GINI of 33 and more are Greece, Portugal and the United Kingdom.

Over a period of about 15 years relatively small differences in the distribution of income - differences that are common in the EU - produce relatively large differences on the budget balance of around 3 percentage points of GDP.

Why do countries with a pronounced inequality of income seems to benefit comparatively little from the additional government revenues accruing from economic growth? At this stage, and taking into account the aggregate level of our analysis, it is difficult to provide detailed answers to this question. An obvious conjecture relates to the typical political pressure to spend the revenues generated by economic growth. It is well possible that this pressure tends to increase with the degree of income inequality making it more difficult for policy makers to resist demands for higher spending or lower taxes.

5. Summary and policy conclusions

The pervasive tendency observed among developed and middle-income countries to run deficits across the cycle - the so called deficit bias - and, consequently, to accumulate government debt, is predominantly attributed to the 'common pool' problem: geographically or otherwise dispersed spending interests competing for government resources do not internalise costs for society as a whole and hence give rise to overspending. In this paper we examined an alternative explanation of the deficit bias, namely the distribution of income. Although there are a number of theories that hypothesise an interplay between income inequality and fiscal performance, to our knowledge, the link has not been empirically tested so far in the economic literature.

To address the quality issues generally signalled in connection with secondary distribution data – available data are not based on a commonly agreed methodology – we used measures of income inequality from different sources. The idea of using different datasets is that the comparison across sources allows us to assess the robustness of results.

Our empirical analysis tends to corroborate the conjecture according to which income inequality makes fiscal discipline more difficult. In line with expectations, the link between income distribution and fiscal performance is not a direct one. Rather, interactions with political factors are at play. The first type of interaction relates to the political orientation of

governments. In particular, an increase in the inequality of income tends to soften the relative preference for fiscal discipline that is characteristic of right wing governments. They seem to adapt their fiscal policy strategy when social conditions change into a direction that may trigger increasing calls for higher government spending.

The second type of interaction is more straightforward. It suggests that, on top of directly weighing on a country's fiscal performance, political instability can produce additional budgetary costs when combined with a more skewed distribution of income. It should be noted however, that the statistical evidence for this type of interaction is less conclusive.

The third and somewhat less obvious channel through which inequality seems to impinge on fiscal performance works in combination with economic growth: a higher degree of income inequality is associated with a muted impact of economic growth on the budget. One way to read this result is that political pressure to spend additional revenues accruing from growth mounts as the distribution of income becomes more uneven.

These three main findings support observations and policy conclusions that seem to be relevant especially in the aftermath of the post-2007 global financial and economic crisis. First, the decision taken in some countries to impose higher taxes on those who purportedly benefitted excessively from the preceding economic progression - which turned out to be unsustainable - is primarily a move dictated by the political opportunity of the moment in view of the mounting dissatisfaction of some parts of the electorate with how the gains of economic growth had been distributed. Nevertheless, consciously or not such decisions may also be grounded in the understanding that the prospective consolidation of the dismal state of public finances could be much more difficult if politics turned a blind eye on the distribution of income. More specifically, our results suggest that inattention with respect to the distribution of income could ultimately trade off unfavourably with sustainability. It could give rise to mounting political pressure for higher redistributive spending at a time when the priority is to reduce spending and to use additional revenues to improve the fiscal situation.

Hence, when designing and implementing fiscal exit strategies for the medium to long run it may be worth assessing the distributional effects of alternative adjustment measures. A particular case in point are prospective pension reforms, which based on available

assessments may contribute to sustainable public finances but imply very low pension levels for a growing number of older people. This type of risk is acknowledged in the 2009 Sustainability Report of the European Commission (2009).

The more generalised conclusions would be that fiscal discipline is easier to safeguard in comparatively more even societies, as equality seems to moderate political pressures for overspending.

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Annex

Data sources of income distribution

UNU-WIDER 2008-update Gini coefficients: Selection of countries and years used in our empirical analysis

Country	Country code	Years	No. of obs.	Average Gini coefficient
1 Austria	AT	1970, 1972, 1976, 1977, 1981, 1983, 1987, 1991, 1994-2005	20	26.4
2 Australia	AU	1960-1969, 1976, 1981, 1985, 1986, 1989, 1995-1998, 2000-2002, 2004	23	24.2
3 Belgium	BE	1969, 1973, 1975-1977, 1979, 1985-1990, 1992-2001, 2003-2006	26	30.6
4 Canada	CA	1961, 1965, 1967, 1969, 1971, 1973-1975, 1977, 1979-2000	31	29.8
5 Switzerland	CH	1978, 1982, 1991, 1992, 1998, 2000-2002	8	33.1
6 Chile	CL	1964, 1968, 1970-1992, 1994-1996, 1998-2000, 2003	32	51.6
7 Czech Republic	CZ	1961-1966, 1968, 1970, 1973-1977, 1979-1981, 1983-1985, 1987-2006	39	21.1
8 Germany	DE	1960, 1962, 1964, 1968-1970, 1973, 1975, 1978, 1980, 1983-2004	32	31.7
9 Denmark	DK	1966, 1971, 1976, 1987, 1992, 2003-2006	9	33.9
10 Estonia	EE	1981, 1986, 1988-1990, 1992-2006	20	33.9
11 Spain	ES	1965, 1973, 1980, 1985, 1986, 1988-1990, 1994-2006	21	31.7
12 Finland	FI	1962, 1966, 1971, 1976, 1981, 1985, 1987-2006	26	26.0
13 France	FR	1962, 1965, 1970, 1975, 1979, 1981, 1984, 1989, 1990, 1994-2004	20	32.5
14 United Kingdom	GB	1961-2003, 2005, 2006	45	28.2
15 Greece	GR	1960-1974, 1979, 1981, 1986, 1988, 1991, 1993-2001, 2003-2006	33	39.1
16 Hungary	HU	1962, 1964, 1967, 1969, 1970, 1972, 1974, 1976-1978, 1980, 1982, 1984, 1986-1994, 1997, 1999-2001, 2005, 2006	28	24.4
17 Ireland	IE	1973, 1980, 1987, 1994-2001, 2003-2006	15	32.9
18 Israel	IL	1961, 1963, 1969, 1976, 1979, 1986, 1987, 1992, 1997, 2001	10	38.9
19 Iceland	IS	2004-2006	3	25.0
20 Italy	IT	1967-1982, 1986, 1987, 1989, 1991, 1993, 1995-2002, 2004-2006	32	35.1
21 Japan	JP	1962-1965, 1967-1987, 1989, 1990, 1995, 1998	29	34.3
22 Republic of Korea	KR	1961, 1964-1966, 1982-1985, 1988, 1992, 1993, 1995-1998, 2004	16	34.3
23 Luxembourg	LU	1985, 1986, 1991, 1994-2001, 2003-2006	15	26.2
24 Mexico	MX	1963, 1968-1970, 1975, 1977, 1984, 1989, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2005	16	53.1
25 The Nederlands	NL	1962, 1967, 1973, 1977, 1981, 1983, 1985, 1987-2003, 2005, 2006	26	29.3
26 Norway	NO	1963, 1970, 1973, 1976, 1979, 1980, 1982, 1984-2001, 2003-2006	29	27.5
27 New Zealand	NZ	1960, 1961, 1963-1978, 1980, 1982-1987, 1989-1992, 1995, 1996, 1998, 2001, 2002, 2004	35	44.9
28 Poland	PL	1960, 1962, 1964, 1966, 1970, 1972, 1973, 1976, 1978, 1980-2006	36	28.1
29 Portugal	PT	1973, 1980, 1990, 1991, 1995-2001, 2004-2006	14	36.7
30 Russian Federation	RU	1981, 1986, 1988-1991, 1994-2006	19	36.1
31 Sweden	SE	1976-1986, 1989-2006	29	32.9
32 Slovenia	SI	1990-2006	17	24.6
33 Slovakia	SK	1987-2006	20	23.0
34 Turkey	TR	1963, 1968, 1973, 1974, 1978, 1979, 1983, 1987, 1994, 2000	10	47.5
35 United States	US	1960-2004	45	42.2
Total			829	32.64

Gini coefficients from Deininger and Squire (1996): selection of countries and years used in our empirical analysis

	Country	Country code	Years	No. of obs.	Mean Gini coefficient
1	Austria	AT	-	-	-
2	Australia	AU	1969, 1976, 1978, 1979, 1981, 1985, 1986, 1989, 1990	9	37.88
3	Belgium	BE	1979, 1985, 1988, 1992	4	27.01
4	Canada	CA	1961, 1965, 1967, 1969, 1971, 1973-1975, 1977, 1979, 1981-1991	21	31.17
5	Switzerland	CH	-	-	-
6	Chile	CL	1968, 1971, 1980, 1989, 1994	5	51.84
7	Czech Republic	CZ	1965, 1970, 1973, 1976, 1977, 1980, 1981, 1985, 1988, 1991-1993	13	22.67
8	Germany	DE	1963, 1969, 1973, 1978, 1981, 1983, 1984	7	31.22
9	Denmark	DK	1976, 1981, 1987, 1992	4	32.08
10	Estonia	EE	1992, 1993, 1995	3	34.66
11	Spain	ES	1965, 1973, 1980, 1985-1989	8	27.90
12	Finland	FI	1966, 1971, 1977-1984, 1987, 1991	12	29.93
13	France	FR	1962, 1965, 1970, 1975, 1979, 1984	6	42.13
14	United Kingdom	GB	1961-1991	31	25.98
15	Greece	GR	1974, 1981, 1988	3	34.53
16	Hungary	HU	1962, 1967, 1972, 1977, 1982, 1987, 1989, 1991, 1993	9	24.65
17	Ireland	IE	1973, 1980, 1987	3	36.31
18	Israel	IL	-	-	-
19	Iceland	IS	-	-	-
20	Italy	IT	1974-1984, 1986, 1987, 1989, 1991	15	34.93
21	Japan	JP	1962-1965, 1967-1982, 1985, 1989, 1990	23	34.82
22	Republic of Korea	KR	1961, 1964-1966, 1968-1971, 1976, 1980, 1982, 1985, 1988	13	34.21
23	Luxembourg	LU	1985	1	27.13
24	Mexico	MX	1963, 1968, 1975, 1977, 1984, 1989, 1992	7	53.85
25	The Nederlands	NL	1975, 1977, 1979, 1981-1983, 1985-1989, 1991	12	28.59
26	Norway	NO	1962, 1967, 1973, 1976, 1979, 1984, 1986, 1991	8	34.21
27	New Zealand	NZ	1973, 1975, 1977, 1978, 1980, 1982, 1983, 1985-1987, 1989, 1990	12	34.36
28	Poland	PL	1976, 1978-1993	17	25.69
29	Portugal	PT	1973, 1980, 1990, 1991	4	37.44
30	Russian Federation	RU	-	-	-
31	Sweden	SE	1967, 1975, 1976, 1980-1990, 1992	15	31.63
32	Slovenia	SI	1992, 1993	2	27.07
33	Slovakia	SK	1992, 1993	2	20.49
34	Turkey	TR	1968, 1973, 1987	3	50.36
35	United States	US	1960-1991, 1987	33	35.49
Total				305	32.34

Gini coefficients from the Luxembourg Income study: Selection of countries and years used in our empirical analysis

	Country	Country code	Years	No. of obs.	Mean Gini coefficient
1	Austria	AT	1987, 1994, 1995, 1997, 2000	5	26.14
2	Australia	AU	1981, 1985, 1989, 1995, 2001, 2003	6	30.23
3	Belgium	BE	1985, 1988, 1992, 1995, 1997, 2000	6	24.63
4	Canada	CA	1971, 1975, 1981, 1987, 1991, 1994, 1997, 1998, 2000, 200	10	29.72
5	Switzerland	CH	1982, 1992, 2000, 2002, 2004	5	28.76
6	Chile	CL	-	-	-
7	Czech Republic	CZ	1992, 1996	2	23.30
8	Germany	DE	1973, 1978, 1981, 1983, 1984, 1989, 1994, 2000	8	26.40
9	Denmark	DK	1987, 1992, 1995, 2000, 2004	5	23.22
10	Estonia	EE	2000	1	36.10
11	Spain	ES	1980, 1990, 1995, 2000	4	32.75
12	Finland	FI	1987, 1991, 1995, 2000, 2004	5	22.68
13	France	FR	1979, 1981, 1984, 1989, 1994, 2000	6	28.77
14	United Kingdom	GB	1969, 1974, 1979, 1986, 1991, 1994, 1995, 1999, 2004	9	31.32
15	Greece	GR	1995, 2000	2	34.10
16	Hungary	HU	1991, 1994, 1999	3	29.93
17	Ireland	IE	1987, 1994-1996, 2000	5	32.70
18	Israel	IL	1979, 1986, 1992, 1997, 2001, 2005	6	32.80
19	Iceland	IS	-	-	-
20	Italy	IT	1986, 1987, 1989, 1991, 1993, 1995, 1998, 2000, 2004	9	32.50
21	Japan	JP	-	-	-
22	Republic of Korea	KR	1981, 1986, 1991, 1995, 1997, 2000, 2005, 2006	8	28.45
23	Luxembourg	LU	1985, 1994, 1997, 2000, 2004	6	24.98
24	Mexico	MX	1984, 1989, 1992, 1994, 1996, 1998, 2000, 2002, 2004	9	47.56
25	The Nederlands	NL	1983, 1987, 1991, 1994, 1999	5	25.40
26	Norway	NO	1979, 1986, 1991, 1995, 2000, 2004	6	23.85
27	New Zealand	NZ	-	-	-
28	Poland	PL	1986, 1992, 1995, 1999, 2004	5	29.44
29	Portugal	PT	-	-	-
30	Russian Federation	RU	1992, 1995, 2000	3	42.53
31	Sweden	SE	1967, 1975, 1981, 1987, 1992, 1995, 2000, 2005	8	22.86
32	Slovenia	SI	1997, 1999	2	24.95
33	Slovakia	SK	1992, 1996	2	21.50
34	Turkey	TR	-	-	-
35	United States	US	1974, 1979, 1986, 1991, 1994, 1997, 2000, 2004	8	34.49
	Total			159	29.70

OECD decile ratios (D9/D1): Selection of countries and years used in our empirical analysis

	Country	Country code	Years	No. of obs.	Mean decile ratio
1	Austria	AT	2004-2007	4	3.29
2	Australia	AU	1975-1995, 1997-2008	33	2.91
3	Belgium	BE	1999-2006	8	2.40
4	Canada	CA	1997-2008	12	3.66
5	Switzerland	CH	1996, 1998, 2000, 2002, 2004, 2006	6	2.55
6	Chile	CL	-	-	-
7	Czech Republic	CZ	1997-2008	12	2.95
8	Germany	DE	1984-2005	22	2.93
9	Denmark	DK	1980-1990, 1996-2007	23	2.38
10	Estonia	EE	-	-	-
11	Spain	ES	1995, 2002	2	3.88
12	Finland	FI	1977, 1980, 1983, 1986-2007	25	2.44
13	France	FR	1970-1998, 2000-2005	35	3.23
14	United Kingdom	GB	1970-2008	39	3.34
15	Greece	GR	-	-	-
16	Hungary	HU	1986, 1989, 1992-2006	17	4.02
17	Ireland	IE	1994, 1997, 2000, 2003-2007	8	3.78
18	Israel	IL	-	-	-
19	Iceland	IS	-	-	-
20	Italy	IT	-	-	-
21	Japan	JP	1975-2008	34	3.05
22	Republic of Korea	KR	1884-2007	24	4.08
23	Luxembourg	LU	-	-	-
24	Mexico	MX	-	-	-
25	The Nederlands	NL	1977-2005	29	2.67
26	Norway	NO	1997-2002	6	2.01
27	New Zealand	NZ	1984, 1986, 1988, 1990, 1992, 1994-2008	20	2.57
28	Poland	PL	1992-1999, 2001, 2002, 2004	11	3.55
29	Portugal	PT	-	-	-
30	Russian Federation	RU	-	-	-
31	Sweden	SE	1975, 1978, 1980-2004	27	2.15
32	Slovenia	SI	-	-	-
33	Slovakia	SK	-	-	-
34	Turkey	TR	-	-	-
35	United States	US	1973-2008	36	4.29
Total				433	3.11

EUROSTAT Gini coefficients: Selection of countries and years used in our empirical analysis

	Country	Country code	Years	No. of obs.	Mean Gini Coefficient
1	Austria	AT	1995-2001, 2003-2008	13	25.5
2	Australia	AU	-	-	-
3	Belgium	BE	1995-2001, 2003-2008	13	27.8
4	Canada	CA	-	-	
5	Switzerland	CH	-	-	
6	Chile	CL	-	-	
7	Czech Republic	CZ	2001, 2005-2008	5	25.2
8	Germany	DE	1995-2001, 2005-2008	11	26.7
9	Denmark	DK	1995, 1997, 1999, 2001, 2003-2008	10	23.0
10	Estonia	EE	2000-2008	9	34.2
11	Spain	ES	1995-2008	14	32.4
12	Finland	FI	1996-2008	13	24.8
13	France	FR	1995-2008	14	27.9
14	United Kingdom	GB	1995-2003, 2005-2008	13	32.8
15	Greece	GR	1995-2001, 2003-2008	13	33.9
16	Hungary	HU	2000-2003, 2005-2008	8	26.8
17	Ireland	IE	1995-2001, 2003-2008	13	31.7
18	Israel	IL	-	-	
19	Iceland	IS	2004-2008	5	26.0
20	Italy	IT	1995-2001, 2003-2008	12	31.3
21	Japan	JP	-	-	
22	Republic of Korea	KR	-	-	
23	Luxembourg	LU	-	-	27.0
24	Mexico	MX	1995-2003, 2005-2008	13	
25	The Nederlands	NL	1995-2003, 2005-2008	13	27.2
26	Norway	NO	2003-2008	6	26.5
27	New Zealand	NZ	-	-	
28	Poland	PL	2000, 2001, 2005-2008	6	32.2
29	Portugal	PT	1995-2001, 2004-2008	12	36.8
30	Russian Federation	RU	-	-	
31	Sweden	SE	1997, 1999, 2001, 2002, 2004-2008	9	23.0
32	Slovenia	SI	2000-2003, 2005-2008	8	22.8
33	Slovakia	SK	2005-2008	4	25.5
34	Turkey	TR	2002, 2003	2	
35	United States	US	-	-	45.5
Total				239	28.9

Detailed definition of political variables used in our empirical analysis

Code	Variable	Description	Source
EXECRR	Political affiliation of government (Dummy)	Party orientation with respect to economic policy: 1=right, parties that are defined as conservative, Christian democratic, or right-wing; 0=centre left, parties that are defined as centrist or when party position can best be described as centristparties as well as parties that are defined as communist, socialist, social democratic.	World Bank DPI2006 Database of Political Institutions
LEGEL	Legislative election (Dummy)	1=there was a legislative election in this year; 0=otherwise	World Bank DPI2006 Database of Political Institutions
GOVSP	Government special interests (Dummy)	1=the party of the largest government party represents any special interests; 0=otherwise	World Bank DPI2006 Database of Political Institutions
MAJ	Margin of government majority (percent)	This is the fraction of seats held by the government. It is calculated by dividing the number of government seats by total (government plus opposition plus non-aligned) seats	World Bank DPI2006 Database of Political Institutions
HERFGO	Herfindahl Index Government	Index of party concentration in government. The sum of the squared seat shares of all parties in the government. An increase of the index singals higher party concentration.	World Bank DPI2006 Database of Political Institutions
HERFOP	Herfindahl Index Opposition	Index of party concentration of opposition. The sum of the squared seat shares of all parties in opposition. An increase of the index singals higher party concentration.	World Bank DPI2006 Database of Political Institutions
HERFTO	Herfindahl Index Total	Calculated in the same manner as the Herfindahl Government and Herfindahl Opposition, but for full parliamentary spectrum.	World Bank DPI2006 Database of Political Institutions
STABS	Political stability (Dummy)	These variables counts the percent of veto players who drop from the government in any given year. Veto players are major institutional figures or institutions and are a function of the political system. Veto players can be the prime minister, the president, chambers of parliment etc.	World Bank DPI2006 Database of Political Institutions
BNKV1052	Number of anti-government demonstrations	Anti-government demonstrations, lagged two years. Number of any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature. Derived from the daily files of The New York Times	Political Instability Task Force (PITF) Report, Center for Global Policy, George Mason University.
SFTPUHVL	Number of annual maximum magnitude of all events in progress	Major political and social upheavals such as ethnic conflicts, civil wars, revolutionary wars or regime crises. The annual maximum magnitude of all such events in progress are summed over the prior 15 years.crises	Political Instability Task Force (PITF) Report, Center for Global Policy, George Mason University.
ECOFR	Economic freedom	The key ingredients of economic freedom are: personal choice, voluntary exchange coordinated by markets, freedom to enter and compete in markets, protection of persons and their property from aggression by others. A detailed description of the construction of the indicator and its ingredients can be found at http://www.freetheworld.com/2009/reports/world/EFW2009_BOOK.pdf. A higher rating indicates a greater degree of economic freedom. As data were available only on a 5-year basis, we have interpolated data to have yearly data.	The Fraser Institute 2009
FR	Fiscal rules	Index calculated by the Directorate-General of Economic and Financial AFfairs of the European Commisison. It measures the strength and coverage of fiscal rules in EU Member States. A higher value indicates a stronger and more comprehensive fiscal rule. A detailed description of how the index is constracted is provided in European Commission (2006).	European Commission