Economical and political determinants of public deficits

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Abstract

We examine a large set of economic, sociopolitical, and institutional variables in a panel of 31 developed and developing countries over the period of 1995-2012 to derive robust conclusions about which variables are important in explaining cross-country differences in public sector deficits. Financial depth, income inequality, cabinet size, and centralization of authority in budgetary decisions are found to be significant and robust determinants of public deficits. We also analyse the impact of the social polarization on the public debt and we discovered that its effects tend to be smaller in countries with better institutional arrangements.

Keywords: Public deficit; Political instability; Social polarization; Income inequality; Budgetary institution; Political fragmentation

Section1: Introduction

According to neoclassical theory of debt (such as the tax-smoothing model of Barro (1979)), we should expect to see fiscal deficits arise when government spending is temporarily high or when output is temporarily low. However, this prediction is hard to reconcile with the reality of large deficit size and wide variations among countries.

A growing literature on fiscal politics has developed theories to explain how political and institutional factors determine fiscal outcomes and has provided supporting empirical evidence; see, for example, Alesina and Perotti (1995) and Persson and Tabellini (1997) for a literature survey. However, the existing empirical studies are mostly on OECD countries. Moreover, there is no comprehensive empirical evaluation that compares different theoretical explanations with each other.

The objective of the paper is to provide a comprehensive empirical test on a large pool of potential explanatory variables of public deficits in a panel of 31 developed and developing European countries over the period of 1995–2012.

We consider three types of structural determinants of deficits: (i) political factors such as political instability, government fragmentation, and political institutions, (ii) social polarization such as income inequality and ethnic divisions, and (iii) institutional factors such as budgetary procedures and rules, bureaucratic efficiency, and democracy.

Most of the existing empirical studies have focused on a relatively small set of explanatory variables. However, one potential problem with drawing strong conclusions from a cross-section study on a large set of explanatory variables is that the partial relationship between a variable and the public deficit may be sensitive to the inclusion of other variables.
Ordinary least squares (OLS) estimates tend to be sensitive to outliers, either observations with unusually large errors or influential observations with unusual values of explanatory variables. One of the most common ways to deal with outliers is to drop observations one at a time. But this is often inadequate because it may miss a group of outliers due to the masking effect. Similarly, single-case diagnostics that are often used to detect outliers (may fail to identify a group of outliers.

In the next section, we briefly describe our data and begin with economic variables. In Sections 3–5, we present the main results bearing on the alternative theories and in Section 6 we report our conclusions.

Section 2: Basic regression

Our basic regression specification is as follows:

\[ \text{DEBT} = \beta_1 \log(\text{GDP\_CAP}_{i,t-1}) + \beta_2 \text{GRGDP} + \beta_3 \text{CPI} + \beta_4 X_{i,t} + \gamma_1 D_t + \gamma_2 \log \text{RD}_{i,t} + \epsilon_{i,t} \]

where \( i \) and \( t \) denote the country and decade (1970–1979 and 1980–1990), and \( \epsilon \) is an error term. CPSURP is the average of the public sector surplus (as a percentage of GDP). According to the tax-smoothing model of fiscal deficits, budget deficits will emerge when output is temporarily low or when government spending is temporarily high (compared to their permanent levels). We follow the existing studies to include the decade average rate of real GDP growth (GRGDP), which may be a proxy for the different degree to which countries in question faced economic recessions during the sample period. We expect GRGDP to have a positive (1) sign in the regressions. However, it is theoretically possible that GRGDP is negatively associated with the public surplus if the successful pressures for higher public expenditures accompany the growing tax revenue due to higher economic growth. Thus, the sign of the coefficient of GRGDP is an empirical question.

We also include the decade average of the rate of CPI\textsuperscript{ion} of the consumer price index (CPI). CPI\textsuperscript{ion} can affect fiscal deficits through various channels. Rapidly rising CPI\textsuperscript{ion} can raise fiscal deficits through higher nominal interest payments. High CPI\textsuperscript{ion} can also lead to lower real tax revenues. If, however, income taxes are not indexed to CPI\textsuperscript{ion}, the above effects of CPI\textsuperscript{ion} on deficits can be at least partially offset by the positive effect of bracket creep on income tax revenue. Given the data availability, it is hard to distinguish between the nominal and real components of interest payments in government spending. Hence, we try to capture the effects of CPI\textsuperscript{ion} on fiscal deficits by including CPI, and expect it to have a negative (2) sign.

The log of real per capita GDP at the start of each decade, LOG(GDP\_CAP), is introduced in order to control for potential effects of economic backwardness on public deficits. Poor countries may have relatively inefficient tax and spending systems and may therefore be more prone to budget deficits. Alternatively, LOG(GDP\_CAP) may capture some sociopolitical effects if social conflicts are greater in poor countries (Roubini, 1991).
Table 1 reports the regression results based on the basic specification (Eq. (1)). Because heteroskedasticity may be more important in a cross-country sample, the standard errors of the coefficients are based on White’s (1980) heteroskedasticity-consistent covariance matrix, which reduces the sensitivity of inference and hypothesis test using OLS estimator to general form of heteroskedasticity. However, these standard errors are not greatly different from those obtained from ordinary least squares.

Table 1
Economic variables on public deficit: pooled decades Dependent variable: consolidated public deficit (percent of GDP)

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<td>2.25 *</td>
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<td>0.71</td>
<td>0.72</td>
<td>0.72</td>
<td>0.71</td>
<td>0.84</td>
<td>2.55</td>
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</table>

White heteroskedasticity-consistent \(t\)-statistics are reported in parentheses. Levels of significance are indicated by asterisks: *1%, **5%, ***10%. See data Appendix B for definitions and sources.

Column (2) includes the ratio of liquid liabilities of the financial system to GDP at the start of each decade (DEBT_TOTAL) as a proxy for the financial market development level, ‘financial depth’. One can imagine that countries with highly developed financial markets can more easily finance the fiscal deficits by issuing bonds without having to resort to CPIlionary finance. The coefficient of DEBT_TOTAL is highly significant and of the correct sign (2). The estimate suggests that a 10 percentage point increase in DEBT_TOTAL is associated with an additional deficit of 0.6% (as a percent of GDP).

Column (4) adds growth rate of terms of trade multiplied by trade openness (EXT) as a proxy for external shocks to the economy. External shocks can be a source of fiscal instability, especially in many developing countries. Changes in export and import prices can affect the public sector balance either through the profits of exporting public enterprises or through import tariffs and taxes on exports. The growth of terms of trade is expected to be associated with smaller budget deficits and to have a greater impact in economies that are more open to trade. EXT has the expected sign (1), but is not significant.

Finally, columns (6) and (7) show the regressions using the developing country sample only. Now the coefficients of CPI become significant at the 5–10% level and are of the expected sign (2). Adjusted \(R^2\) rises to 0.84–0.85. GRGDP, and DEBT_TOTAL are still significant, suggesting that deficits in the developing countries are equally well explained by these economic variables. Note that the statistical significance of LOG(GDP_CAP) becomes weaker with the degree of government weakness. Many studies have suggested that coalition governments not only tend to be weaker than single-party majority governments, but also may have greater difficulty in reaching consensus. To capture this, we employ a variable COAL, which is a decade average of annual observations that take the following values: 0 for a one-party government with no major opposition party in the legislature; 1 for a coalition government with more than one party but with no major opposition party; 2 for a coalition
government with more than one party but with a major opposition party in the legislature; and 3 for a minority government.

Section 3: Government fragmentation

The government fragmentation approach stresses the distributional conflict among different parties or policymakers, which is often associated with government weakness such as coalition or minority governments. Coalition governments may delay the necessary fiscal adjustments after the build-up of large deficits due to some adverse exogenous shocks because political parties struggle over the distribution of adjustment burden (Alesina and Drazen, 1991). Government weakness, therefore, implies that public debt is a residual source of finance that simply reflects the inability of the government to cut expenditures or raise taxes. To test this prediction, we first consider direct measures of government weakness, the number of seats held by the largest party in the lower house (SEAT) and the party fractionalization index (PARFRACT). We expect deficits to increase.

Table 3 shows somewhat disappointing results. Only the coefficient of COAL has the expected sign (2), but it is not statistically significant. Edin and Ohlsson (1991) and Kontopoulos and Perotti (1999) argue that the evidence that weaker governments are associated with larger deficits rests mostly on the inclusion of minority governments. Column (4) replicates the regression using MINOR, which is intended to capture only minority governments. The indicator MINOR is a decade average of minority government dummy variables that take the value of 1 for minority governments, and 0 otherwise. The coefficient of MINOR is insignificant, although it is of the correct sign (2).

Column (5) tests this hypothesis using a measure of size fragmentation, CABSIZEx (the number of ministers in the cabinet). The coefficient of CABSIZEx is highly significant and has the expected sign (2). Consistent with the finding of Kontopoulos and Perotti (1999) for OECD countries, larger cabinet size is strongly associated with larger public deficits. The magnitude of this effect on deficits is quite substantial. In particular, an increase in cabinet size by one minister is associated with a larger deficit of 0.2% of GDP. Columns (6) and (7) display regressions for the developing countries. Once again, the coefficient of COAL is
insignificant, suggesting that the weak government argument is weak. Even the coefficient of CABSIZE is now insignificant. CABSIZE is thus less strongly associated with higher deficits in the developing country sample than in the whole sample.

Section 4: Political regime and electoral law

The political regime and electoral law approach is related to comparative politics. Persson and Tabellini (1999) study how political institutions affect the size of government spending. Although not aiming to explain fiscal deficits, they find that majoritarian elections lead to more redistribution and larger governments and that presidential regimes lead to less redistribution and smaller governments.\textsuperscript{20} Under presidential systems in general, the government has greater independent and centralized authority as well as accountability (Shugart and Carey, 1992). Hence economic policy can be formulated and implemented without much delay or interference from the legislature and can be more easily reversed if it delivers undesirable outcomes. The opposite may be true of the parliamentary system, depending on the electoral laws and their degree of proportionality. Therefore, we expect different fiscal outcomes across regimes (presidential versus parliamentary) and electoral systems (proportional versus majoritarian).

Our indicator of regime type, PRES — a dummy variable taking the value of 1 for a presidential regime — is constructed mainly based on Mainwaring (1993), which is augmented and cross-checked with other sources such as Powell (1982), Shugart and Carey (1992) and Cox (1997).\textsuperscript{21} The first column in Table 4 displays the regression for the entire sample period (1970–1990) when PRES is used. The coefficient of PRES is not statistically significant, although it has the expected sign (1). According to the implied magnitude, public surpluses are 0.9\% of GDP larger in presidential regimes than in parliamentary systems. The PRES is again insignificant in the developing country sample (column (2)).

Our indicator for the electoral rule is MAJ, which takes the value of 1 for majoritarian elections and 0 for proportional elections. Column (3) of Table 4 shows that the coefficient on MAJ is significantly negative.

Political scientists often argue that coalition or minority governments are more likely to emerge under a parliamentary system with proportional electoral laws. Although the government type indicator (COAL or MINOR) itself turned out to be statistically insignificant, this suggests that there may still be an interesting interaction between regime types and electoral rules.

The estimated coefficients of the presidential regime dummies (PRES and PRESPT) are both significantly positive once we control for MAJ and other variables. Conversely, this implies that — holding the electoral law dummy and other variables constant — the parliamentary regime is significantly, negatively associated with public surpluses.

| Table 3 |
| Presidential vs. parliamentary system and proportional vs. majoritarian electoral laws. Dependent variable: consolidated public surplus (percent of GDP). |
The magnitude of effects on deficits of regime types varies somewhat systematically across electoral rules. For example, the presidential regime (parliamentary) is associated with larger surpluses (larger deficits) under proportional law than under majoritarian law.

The partial effects of the var PARL and PRESPT s may be explained by Tsebelis’s veto player hypothesis that regime instability is associated with a larger number of veto players that lack ideological cohesion (Tsebelis, 1995). According to this hypothesis, one can expect more veto players to be associated with larger fiscal deficits. Majoritarian rule tends to have two parties, and therefore, only one veto player in the parliamentary regime. By contrast, proportional parliamentary systems tend to have a greater number of veto players. This may induce proportional parliamentary regimes to run larger deficits. In short, public deficits are lower in the presidential system than in the parliamentary system once we control for electoral law and other variables. We also find econometric evidence that the combination of a proportional electoral law and a parliamentary system can be a dangerous mix for fiscal outcomes.

Section 5 Social polarization: income inequality and ethnic divisions

Income inequality has long been mentioned as an important source of social conflict, which may lead to populist fiscal policies and poor macroeconomic performance. This has been extensively documented in studies on Latin America and sub-Saharan Africa. Yet there are very few theories that explain why unequal income distributions can lead to large deficits. Alesina and Rodrik (1994) and Persson and Tabellini (1994) suggest that there may be a tendency of the majority to vote for large redistributive spending in a democratic country with an unequal income distribution. Woo (1999) develops a model of fiscal deficits in which the polarization of preferences play a crucial role in the evolution of fiscal deficits. The idea is that in a two-sector economy, the more unequal the initial income distribution, the larger the sectoral income gap during industrialization, and the more likely the polarization of sector preferences for different types of government spending. In a highly polarized society, policymakers face greater incentives to insist on higher spending for their preferred sectors, leading to larger deficits. This model yields a sharp empirical prediction that fiscal deficits are larger in countries with highly polarized societies (as measured by income inequality).

There are very few empirical studies on the impact of income inequality on fiscal deficits.
Woo (1999) provides the first econometric evidence that income inequality is a significant determinant of public deficits, even after controlling for a number of other variables in a cross-section of 91 countries for the period of 1970–1990.

As an indicator of social polarization, we first consider the three measures of income inequality: GINIHI, AGINIHI, and AGINI from Deininger and Squire (1996). The indicator GINIHI is high-quality data of Gini coefficients measured as close either to the end of previous decade or to the start of each decade, 1970s and 1980s, as possible. The indicator AGINIHI is the decade average of all high-quality data of Gini coefficients. Finally, the indicator AGINI is the decade average of all available data of Gini coefficients. We expect a high degree of social polarization as proxied by Gini coefficients to be associated with larger public deficits.

Table 5 delivers a striking result: the coefficients of the income inequality indicators are all highly significant.

There are a couple of things to note regarding the interplay between income inequality measures and other variables. The age structure of the population may be correlated with income inequality, and of course, with initial income levels as well. While income inequality would be lower among the elderly, income inequality may affect the life expectancy and presumably reduce the ratio of the elderly in the population. Indeed, Gini coefficients and POP65 are strongly and negatively correlated.

Next, we consider ethnic divisions, which are another source of social polarization. Our indicator of ethno-linguistic fragmentation, ETHNIC, measures the likelihood that any two randomly chosen individuals in a country will not belong to the same ethno-linguistic groups (Taylor and Hudson, 1972). The value of ETHNIC increases with the number of ethnic groups in a country. Column (4) in Table 5 shows the regression result when ETHNIC is included. It enters with the expected sign (2) and its coefficient is significant at 10%.
Section 6: Institutions

Recently, a growing number of studies have paid a great deal of attention to the idea that budgetary procedures — the rules according to which budgets are drafted by a government, amended and passed by parliament, and implemented by the government — have a direct influence on fiscal outcomes (see Alesina and Perotti (1996a) for a literature survey).10 In general, these studies find that a budgeting process that allows the prime minister or finance minister to have a dominant position over the spending ministers, and limits the amendment power of parliament is conducive to fiscal discipline. However, empirical studies have been largely limited to only a small sample of countries.

We first examine some indicators of budgetary institutions, and then consider broad measures of institutional quality for a number of reasons. Firstly, high-quality institutions can make a difference for public finance: a more efficient tax-collection system and better monitoring on disbursement should strengthen the fiscal position of the government. Secondly, good institutions are found to be associated with higher growth, which may affect sociopolitical variables. More-over, when institutions of conflict management are well-established and work well enough to suppress conflicts of interest among different groups, the social polarization effect we found earlier may be less important in determining the fiscal outcomes. Thirdly, institutional quality indicators such as the efficiency of public sector, the degree of corruption, and the rule of law can be a good measure of the quality of budgetary institutions. This is because government institutions tend to be shaped by common factors such as economic, political, cultural, and historical circumstances and change only slowly (La Porta et al., 1999).

Table 6 reports the regression results using MF. Despite the small sample size, it yields a striking result. The coefficient of MF is highly significant and of the expected sign (1). In addition, we considered measures for the possibility to amend the executive’s budget (AMEND), flexibility of budget execution (INFLEX), and the degree of transparency of budget documents (TRANS). Although TRANS and AMEND have the expected sign (1), they are not significant in our sample. However, it should be noted again that our indices are far from perfect. In fact, it is possible to create dummy variables out of these indices, which become significant in our basic regression.

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ICRGE is based on underlying numerical evaluations regarding the rule of law, bureaucratic
quality, corruption, expropriation risk, and government repudiation of contracts (Knack and Keefer, 1995). It ranges between 0 and 10, with high values representing better institutions. Columns (8)–(9) in Table 6 show the results. In column (8), the coefficient of ICRGE is significant at the 1% level and is of the expected sign (1). It becomes insignificant only when CABSIZE is also included (as in column (9)).

At the beginning, we proposed a working hypothesis that sociopolitical polarization is important, yet its effect on public deficits might be more pronounced or suppressed, depending on the political and institutional environment. We stress the importance of the interplay between social polarization and poor institutions in understanding public deficits by constructing composite indices of sociopolitical polarization that take institutional constraints into account, borrowing the idea from Rodrik (1999). Here we consider our main indicator of social polarization, AGINI; two institutional variables, PM and ICRGE; and the size fragmentation indicator CABSIZE. Higher values of PM and ICRGE indicate greater centralized authority of the prime minister and greater efficiency of institutions, respectively.

\[
\text{Polar1} = \text{AGINI} \times (3 - \text{PM}); \\
\text{Polar2} = \text{AGINI} \times (10 - \text{ICRGE}); \text{ and} \\
\text{Polar3} = \text{AGINI} \times \text{CABSIZE} \times (10 - \text{ICRGE}).
\]

The idea behind Polar3 is that the effect on deficits of social polarization is stronger when there are more policymakers representing potentially conflicting interests of socio-economic groups in poor institutional settings. These indices are expected to be associated with larger public deficits, which is supported by regressions (10)–(15) of Table 6. They are all significant at the 1–5% level and are associated with greater deficits, even after controlling for all the important and significant variables. This is also largely true for the developing countries. Although the coefficient of polar2 becomes insignificant (see column (17)), the result is quite sensitive to the inclusion of some observations.

**Section 7: Conclusions**

We tested different theories of public deficits, using more than 40 economic, sociopolitical and institutional variables, and could identify which of the variables are important in explaining the different size of public deficits across countries. Sociopolitical instability, income inequality, a large size of the cabinet, and lack of central authority in the fiscal decision-making process are strongly negatively associated with the public surplus. While proportional parliamentary regimes tend to run larger deficits, government weakness or regime type does not seem to be consistently associated with deficits.

Also the budgetary institutions and government institutions in general matter for the fiscal stance. In particular, countries with highly polarized societies or greater sociopolitical instability may achieve fiscal prudence by improving budgetary procedures and rules (for example, delegating strong power to the finance minister). Indeed, the negative effects of sociopolitical instability or social polarization on deficits can be mitigated by institutional arrangements such as stringent budgetary rules. While it is very important to create conditions conducive to fiscal prudence by promoting sociopolitical stability and / or equitable income
distribution, sociopolitical instability or an unequal income distribution may be much harder to address than cabinet size or budgetary institutions in order to reduce budget deficits. Therefore, it is all the more important to build better budgetary institutions.

References