DISCUSSION PAPER SERIES

No. 10069

A SURPLUS OF AMBITION: CAN EUROPE RELY ON LARGE PRIMARY SURPLUSES TO SOLVE ITS DEBT PROBLEM?

Barry Eichengreen and Ugo Panizza

INTERNATIONAL MACROECONOMICS

Centre for Economic Policy Research

www.cepr.org

Available online at: **www.cepr.org/pubs/dps/DP10069.php**

ISSN 0265-8003

A SURPLUS OF AMBITION: CAN EUROPE RELY ON LARGE PRIMARY SURPLUSES TO SOLVE ITS DEBT PROBLEM?

Barry Eichengreen, University of California, Berkeley and CEPR
Ugo Panizza, The Graduate Institute, Geneva

Discussion Paper No. 10069
July 2014

Centre for Economic Policy Research
77 Bastwick Street, London EC1V 3PZ, UK
Tel: (44 20) 7183 8801, Fax: (44 20) 7183 8820
Email: cepr@cepr.org, Website: www.cepr.org

This Discussion Paper is issued under the auspices of the Centre's research programme in **INTERNATIONAL MACROECONOMICS**. Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as an educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

Copyright: Barry Eichengreen and Ugo Panizza

CEPR Discussion Paper No. 10069

July 2014

ABSTRACT

A Surplus of Ambition: Can Europe Rely on Large Primary Surpluses to Solve its Debt Problem?*

IMF forecasts and the EU's Fiscal Compact foresee Europe's heavily indebted countries running primary budget surpluses of as much as 5 percent of GDP for as long as 10 years in order to maintain debt sustainability and bring their debt/GDP ratios down to the Compact's 60 percent target. We show that primary surpluses this large and persistent are rare. In an extensive sample of high- and middle-income countries there are just 3 (nonoverlapping) episodes where countries ran primary surpluses of at least 5 per cent of GDP for 10 years. Analyzing a less restrictive definition of persistent surplus episodes (primary surpluses averaging at least 3 percent of GDP for 5 years), we find that surplus episodes are more likely when growth is strong, when the current account of the balance of payments is in surplus (savings rates are high), when the debt-to-GDP ratio is high (heightening the urgency of fiscal adjustment), and when the governing party controls all houses of parliament or congress (its bargaining position is strong). Left wing governments, strikingly, are more likely to run large, persistent primary surpluses. In advanced countries, proportional representation electoral systems that give rise to encompassing coalitions are associated with surplus episodes. The point estimates do not provide much encouragement for the view that a country like Italy will be able to run a primary budget surplus as large and persistent as officially projected.

Barry Eichengreen
University of California
Department of Economics
508-1 Evans Hall / MC 3880
Berkeley, California 94720-3880
USA

Email: eichengr@econ.berkeley.edu

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=100605

Ugo Panizza
The Graduate Institute
Rue de Lausanne 132
P.O. Box 136
CH - 1211 Geneva 21
SWITZERLAND

Email:
ugo.panizza@graduateinstitute.ch

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=144016

*We thank Andrea Presbitero, Edward Robinson and Yi Ping Ng for comments and suggestions.

Submitted 13 July 2014

1 Introduction

Europe's problem economies have heavy debts and gloomy growth prospects. This fact raises obvious concerns about the sustainability of public debts, concerns that have manifested themselves periodically in increases in yields that investors demand to hold governments' debt securities. As we write, investors are relatively sanguine. The question is whether they will remain so. It is whether and when worries about debt sustainability will be back.

The IMF, in its *Fiscal Monitor* (2013), sketches a scenario in which the obligations of heavily indebted European sovereigns first stabilize and then fall to the 60 percent level targeted by the EU's Fiscal Compact by 2030. It makes assumptions regarding interest rates, growth rates and related variables and computes the cyclically adjusted primary budget surplus (the surplus exclusive of interest payments) consistent with this scenario. The heavier the debt, the higher the interest rate and the slower the growth rate, the larger is the requisite surplus. The average primary surplus in the decade 2020-2030 is calculated as 5.6 percent for Ireland, 6.6 percent for Italy, 5.9 percent for Portugal, 4.0 percent for Spain, and (wait for it…) 7.2 percent for Greece.[1]

These are very large, if not wholly unprecedented, primary surpluses. There are both political and economic reasons for questioning whether they are plausible. As any resident of California can tell you, when tax revenues rise, legislators and their constituents apply pressure to spend them.[2] In 2014 Greece, when years of deficits and fiscal austerity, enjoyed its first primary surpluses; the government came under pressure to disburse a "social dividend" of €525 million to 500,000 low-income households (*Kathmerini*, the Greek newspaper, called these transfers "primary surplus handouts.") Budgeting, as is well known, creates a common pool problem, and the larger the surplus, the deeper and more tempting is the pool. Only countries with strong political

[1] The cyclical adjustment makes little difference to the calculations over a period as long as a decade, and for simplicity we ignore it in what follows.

[2] The tax system in California is heavily geared toward capital gains income on investment, which is highly cyclical due to the importance of, inter alia, high tech in the state economy.

and budgetary institutions may be able to mitigate this problem (de Haan, Jong-A-Pin and Mierau 2013).

Turning to the economics, a slowdown in global growth, a deterioration in the terms of trade, and recession can all disrupt the efforts of even the most dedicated governments seeking to run large primary surpluses for a decade. Recession depresses tax revenues, and the spending cuts needed to maintain the surplus above the promised threshold may depress activity and revenues still further. The government may prefer, with good reason, to let its automatic fiscal stabilizers operate. Whatever the other merits of that choice, it too will prevent the string of primary surpluses from being maintained.

These are high hurdles. Researchers at the Kiel Institute (2014) conclude that "assessment of historical developments in numerous countries leads to the conclusion that it is extremely difficult for a country to prevent its debt from increasing when the necessary primary surplus ratio reaches a critical level of more than 5 percent." Readers need not subscribe to their 5 percent threshold to agree that there is an issue. And where there is an issue, the issuer may need help from debt forgiveness, foreign aid, inflation, or debt restructuring.[3]

How seriously should one take such worries? We analyze a sample of 54 emerging and advanced economies over the period 1974-2013 as a step toward answering this question. We first establish that primary surpluses as large as 5 percent of GDP for as long as a decade are rare; there are just 3 such nonoverlapping episodes in the sample. These cases are special; they are economically and politically idiosyncratic in the sense that their incidence is not explicable by the usual economic and political correlates. Close examination of the three cases suggests that their experience does not scale.

Analyzing a less restrictive definition of episodes – surpluses averaging at least 3 percent of GDP for 5 years – we find that surplus episodes are more likely when growth is strong, when the current account of the balance of payments is in surplus (savings rates are high), when the debt-to-GDP ratio is high (heightening the urgency of

[3] Reinhart and Rogoff (2013) reach a similarly gloomy conclusion.

fiscal adjustment), and when the governing party controls all houses of parliament or congress (its bargaining position is strong). Strikingly, left wing governments are more likely to run large, persistent primary surpluses. In advanced economies, proportional representation electoral systems that are thought to give rise to encompassing coalitions are associated with surplus episodes. The point estimates do not provide much support for the view that Europe's crisis countries, Italy for example, will be able to run primary budget surpluses as large and persistent as officially projected.

2 The simple analytics of debt sustainability

Although there is no strong evidence that public debt has a causal effect on growth (Panizza and Presbitero, 2013, 2014) or that there is a critical threshold where debt becomes a problem (Pescatori, Sandri, and Simon, 2014), the level and composition of debt can have important implications for economic stability and the wellbeing of current and future generations.

Public debt can finance high-return investment projects and expansionary fiscal policies during recessions. Able public debt management also allows reducing tax distortions over the business cycle. Thus problems, including problems of sustainability, that prevent a government from resorting to debt in these times and circumstances will result in suboptimal public policy. To be sure, public debt can also be used to finance wasteful public spending and facilitate delay in necessary but politically costly structural reforms. High levels of public debt may alter the structure of public expenditure since, for any given interest rate and level of government spending, a higher level of debt implies that a larger share of expenditure needs to be dedicated to paying interest. This constraint could be useful if it creates incentives to reduce wasteful spending. However, wasteful expenditure is often politically difficult to cut. Therefore, debt service often crowds out productive public spending, such as investment in human and physical capital (Bacchiocchi, Borghi and Missale 2011).

High levels of public debt can increase financial fragility. They raise the risk of a crisis, self-fulfilling or otherwise, limiting the government's ability to implement

countercyclical polices during recessions. Crises, by raising doubts about future payments of interest and repayments of principal, create uncertainty which depresses consumption and investment. Given how the government often has first call on available resources, it is unusual for other borrowers (corporates etc.) to be regarded as more creditworthy than the sovereign (once upon a time the rating agencies' practice of never assigning a higher credit rating to entities other than the government was known as "the sovereign ceiling"). Thus, problems of debt sustainability for the sovereign can also impair the creditworthiness and ability to borrow of those other entities.[4]

Debt sustainability is customarily described in terms of an inter-temporal constraint stating that net initial debt plus the present value of expected future government expenditures to be equal to (or not greater than) the present value of expected future government revenues. Alternatively, net initial debt must be smaller or equal to the present value of expected future primary surpluses minus the expected value of future interest payments.

$$D_t \leq \sum_{k=0}^{\infty} \frac{E_t(PS_{t+k} - i_{t+k}D_{t+k})}{\prod_{j=1}^{k}(1 + r_{t+j})}$$

The intertemporal budget constraint is an accounting identity that, by definition, is always satisfied (Mendoza 2003). A government could decide to satisfy its budget constraint by defaulting or by inflating away its debt. In this sense, the standard definition of debt sustainability stating that a "… borrower is expected to be able to continue servicing its debt without an unrealistically large future correction to the balance of income and expenditure" (IMF, 2002, p. 4) implicitly assumes that adjustments through the primary balance are preferable to adjustments via default or inflation.

The above definition requires formulating expectations of the future path of government revenues, expenditures, on the average interest rate paid on government

[4] In the context of developing-country debt, this is known as the debt overhang problem (Sachs 1989, Krugman 1989). For a discussion of sovereign ceiling see Borensztein, Cowan, and Valenzuela (2013).

debt and on the economy's discount rate. Uncertainty about the future paths of these variables can be enough to precipitate a crisis if investors, growing more uncertain, demand higher interest rates in order to take up new debt issues, and those higher interest rates strain the government's debt servicing capacity. Such crises can be self-fulfilling (Cole and Kehoe 2000). Indeed self-fulfilling crises may happen even if all investors know that that a country is fundamentally solvent, but they do not know what other investors think about what other investors think (i.e., in the absence of common knowledge – see Morris and Shin 1998).

Before the introduction of the euro, European governments that borrowed in domestic currency were less likely to be subject to self-fulfilling crises because the national central banks (which could print an unlimited amount of domestic currency) acted as de facto lenders of last resort. But with the introduction of the euro, national central banks could no longer act as lenders of last resort. Eurozone countries have thus become similar to emerging market countries that do not borrow in their own currency (Eichengreen, Hausmann and Panizza, 2005, De Grauwe, 2011, Dell'Erba, Hausmann and Panizza, 2013, De Grauwe and Ji, 2013).

In the absence of a lender of last resort, policymakers may adopt restrictive policies with the hope of reassuring market participants and reducing the likelihood that a sudden change in investor sentiment pushes the country towards the bad equilibrium. However, restrictive policies that reduce growth in the short run and lead to political turmoil and instability may backfire, amplifying investors' concerns. In its downgrades of European sovereigns, Standard & Poor's mentioned that restrictive policies may have a negative effect on debt sustainability (Standard & Poor's, 2012).

All this is to say that fiscal policy is not made – or evaluated – in a vacuum. Investors focus not just on the evolution of the country's debt-to-GDP ratio but also on the presence or absence of a lender of last resort that can rule out a self-fulfilling crisis. In the case of countries in the Eurozone, this second element boils down to the willingness of the international community and the European Central Bank to support the country if a run were to occur. While debt sustainability is a long-term concept, the near term evolution of debt may become disproportionately important if it is believed

that policymakers in Northern Europe are more likely to approve ECB-ESM support if the fiscal numbers are good. Since good fiscal numbers increase the likelihood of support were a crisis to happen, they reduce the likelihood that the crisis will happen and that the ECB will be called on “to do whatever it takes.”

Compare Italy and Japan. Italy has the fourth largest stock of public debt in the world, the second highest debt-to-GDP ratio in the Group of Seven advanced economies, and the highest debt service ratio in the G7 (Table 1).[5] Japan, in contrast, has the second largest stock of debt (after the United States) and the highest gross debt ratio (although the difference in net debt ratios is lower). Yet Italy is required to pay higher interest rates in order to borrow. One way of understanding this is that Italy is more at risk of a run because the market in Italian debt can no longer be backstopped by the Bank of Italy. An example of this kind of incipient run was in the autumn of 2011, when the yield on Italian ten-year government bonds spiked to above 7 percent (with a spread of more than 500 basis points over 10-year German Bunds). It took President Draghi's announcement that the ECB was prepared to do "whatever it takes" to calm the markets.

The official sector, for its part, is relatively sanguine about the near term evolution of Italian public debt. Current IMF projections forecast the debt-to-GDP ratio as peaking at 135 percent of GDP in 2014 and then falling by 15 percentage points by 2019 (Figure 1). These forecasts assume that Italy will be able to reach a primary surplus of 5 percent of GDP by 2017 and maintain it for a considerable period thereafter. Under the EU’s newly agreed Fiscal Compact, Italy needs to reduce the gap between its current debt-to-GDP ratio and the Maastricht Treaty’s 60 percent threshold by one-twentieth per year. Under reasonable assumptions on interest rates and nominal GDP growth, this objective will requires the country to maintain a primary surplus of approximately 5 percent of GDP for at least ten years.[6]

[5] In 2012, Italy spent 5.4 percent of GDP to service its public debt, Japan spent less than one percent of GDP. This is due to both low interest rates and to the fact that in Japan net debt is much lower than gross debt, but this is not the case in Italy (Table 1). This note focuses on gross public debt. Panizza and Presbitero (2013) discuss the pros and cons of using different definitions of debt.

[6] Panizza (2014) shows that this is the case for, inter alia, growth of 1 percent, inflation of 1.5 percent, and an interest rate of 4.5 percent.

These assumptions contrast with assessments as recently as four years ago, when IMF staff deemed a large fiscal adjustment in Italy to be infeasible (Mody, 2014). They discount the fact that there is only one previous 5-year period when Italy has been able to achieve an average primary surplus close to 5 percent of GDP (4.8 percent of GDP over between 1996 and 2000).[7] Italy has relative large amount of debt to roll over in the next few years (more than €550 billion, more than a quarter of the stock outstanding, in 2014-16). If investors doubt Italy's ability to roll over its debt, they may decide to test the ECB's willingness to do whatever it takes.

Italy is not unique. Several other countries will similarly require large and persistent primary surpluses on conventional assumptions regarding growth, inflation and interest rates. IMF (2013) lists 10 advanced economies that, in order to achieve its debt targets, will have to maintain a cyclically adjusted primary surplus close or greater than 3 percent of GDP over the entire decade 2020-30 (Table 2).[8]

In this paper we study the realism of these expectations of large and persistent primary surpluses.

3 Large and Persistent Primary Surplus Episodes

We study the frequency of large and persistent primary surplus episodes using an unbalanced panel of 54 emerging and advanced economies over the 1974-2013 period. Our sample includes 29 advanced economies and 27 middle income countries.[9] Our

[7] During 1996-2006, nominal GDP growth was relatively high, Italian electors were enthusiastic about the euro and willing to make sacrifices in order to be part of the common currency, and the government was able to conduct off-balance-sheet operations that increased the primary surplus. Even with these favorable conditions, the high primary surplus turned out to be short-lived. The average primary surplus went back to 2.2 percent of GDP over 2000-2007. This is in line with a long long-term average (1990-2006) of 2.3 percent of GDP and with the 1990-99 average of 2.5 percent of GDP.

[8] The average primary surplus for the 26 advanced economies considered by the IMF is 3.6 percent of GDP.

[9] Data on surpluses are from the IMF's World Economic Outlook data base as supplemented by Mauro, Romeu, Binder and Zaman (2013), OECD, and the World Development Indicators. Mauro et al. provide data in some cases for general government budgets and in others for central government budgets. To ensure compatibility with the WEO data base, we add only observations for general government budgets. Table A1 in the Appendix lists the countries and periods included in our sample. For years prior to 1990 fiscal data for emerging market countries are often unavailable or of poor quality. To make the sample more balanced, we report results that use data for 1974-2013 for advanced economies, data for 1990-2013

concern in this paper is primarily with the debt sustainability prospects of high income countries, in Europe in particular; this guides the construction of the sample. However, we also conduct some robustness tests using all economies for which data are available with an income per capita of at least $2000.

We define a primary surplus episode as large when the average value of the primary surplus during the episode is, alternatively, greater than 3, 4, or 5 percent of GDP. We define a primary surplus as persistent when the episode lasts at least 5, 8, or 10 years. We thus have a total of 9 definitions of large and persistent. Tables A2-A3 in the Appendix list all country-year observations satisfying these nine definitions.

In several cases a series of overlapping periods satisfies one or more of our definitions. For instance, Belgium had an average primary surplus greater than 3 percent of GDP for each five-year period from 1989-93 to 2004-08 and for each ten-year period from 1987-96 to 2000-09. These overlapping episodes would be problematic for our statistical analysis, however, so we build a dataset of nonoverlapping episodes by selecting, among all possible candidates, the episode with the largest average primary surplus in any given 5, 8, and 10 year window.[10]

To study the economic and political conditions under which countries have large and persistent primary surpluses, we need comparison groups. For the five-year episodes, the comparison group consists of all possible nonoverlapping five-year periods between 1974 and 2013 (1974-78; 1979-83; 1984-88; 1989-93-1994-98; 1999-03; 2004-08-2009-13) which: (i) do not do not overlap with a window starting two year before and ending two year after the episodes identified in Table 3 and (ii) do not

---

for emerging market economies and data for 1995-2013 for transition economies. We also drop observations for an 8-year window around sovereign default episodes. See Table A8 for details on data sources.

[10] In the example of Belgium described above, this procedure produces only one non-overlapping episode (1998-2002). There are, however, cases in which long strings of primary surpluses identify more than one episode. For instance, Denmark had an average primary surplus greater than 3 percent of GDP for each five-year period from 1996-2000 to 2005-09. This string of episodes yields 2-five year non-overlapping periods with local maxima (1997-2001 and 2004-08). Therefore, we classify these two episodes as large and persistent under the 3 percent five year category. An alternative way of identifying non-overlapping periods would be to employ a Chow test for structural breaks and select the episode that maximizes the test. This procedure is, however, problematic in our context because some countries have short primary surplus series.

overlap with the episodes of Table A2. We follow the same procedure for our eight and ten-year episodes samples.

This procedure reveals that large and persistent primary surpluses are relatively rare. Out of 235 nonoverlapping five-year periods in our dataset, there were 36 five-year nonoverlapping episodes with an average primary surplus of at least 3 percent of GDP (15 percent of the sample), 18 five-year episodes with an average primary surplus of at least 4 percent of GDP (8 percent of the sample), and 12 five-year episodes with an average primary surplus of at least 5 percent of GDP (5 percent of the sample). See Table 3.

Eight-year periods of large primary surpluses are even more exceptional. Out of 185 nonoverlapping episodes, we find 17 episodes with an average primary surplus of at least 3 percent of GDP (9 percent of the sample), 12 episodes with an average primary surplus of at least 4 percent of GDP (6 percent of the sample), and 4 episodes with an average primary surplus of at least 5 percent of GDP (2 percent of the sample). See Table 4.

Finally, out of 113 nonoverlapping ten-year episodes, there are 12 episodes with an average primary surplus of at least 3 percent of GDP (11 percent of the sample), 5 episodes with an average primary surplus of at least 4 percent of GDP (5 percent of the sample), and 3 episodes with an average primary surplus of at least 5 percent of GDP (2.5 percent of the sample). See Table 5.

Thus, large primary surpluses for extended periods are possible, but they are the exception.

4 The correlates of large and persistent primary surpluses

We now examine the correlation between primary surplus episodes and a set of economic and political variable. Without an instrumental variable strategy we are unable to make strong claims of causality. However, some correlations are clearly more causal than other. For example, the debt-to-GDP ratio is a “state variable” – the stock of debt is slowly moving and largely predetermined at a point in time, and any correlation

with the primary surplus plausibly reflects causality running from the inherited debt to the fiscal balance. Any endogeneity due to causality running from primary surpluses to the debt stock will bias the coefficient estimates away from those we find. For other variables, such as the current account balance, in contrast, simultaneity is likely to be a serious issue, and due caution when interpreting the results is advised.

4.1 Univariate analysis

Table 6 reports the average values for economic variables for the control group and surplus episodes, the difference between the two averages, and the two-sided p-value of a mean comparison test (in bold when the difference between the two groups is significant at the 10 percent confidence level).

Large primary surpluses coincide with periods of above average economic growth. This is what one would expect in the presence of countercyclical fiscal policy. However, the difference in growth is not always statistically significant.[11] It is significant when we consider five-year episodes. But when we look at eight and ten-year episodes, in particular, we find that while average growth is higher when the primary surplus is above the 3, 4, and 5 percent threshold, the difference between our high primary surplus episodes and the control group is often statistically insignificant.

There is some indication that large, extended primary surpluses are more likely in high income countries.[12] It could be that the level of per capita GDP is standing in for the strength of institutions and that countries with stronger institutions are better able to run large, persistent surpluses. We consider this possibility below.

World GDP growth is positively related to large, persistent primary surpluses. For 6 of our 9 possible definitions of a large and persistent surplus, we find that World GDP growth is significantly higher during episodes of high primary surpluses than in control periods. We will see that this effect tends to disappear, however, when we control for domestic GDP growth.

[11] Abbas et al. (2013) similarly find that successful debt reversals are more likely when global growth is high. But they do not undertake the formal statistical tests we report here.
[12] Although, again, the difference is not always statistically significant.

Primary surplus episodes are associated with current account surpluses (the difference with the control group is always large and statistically significant). This is what one would expect from basic national accounts as the current account is equal to government savings plus private savings minus investment.[13]

We expect a high debt-to-GDP ratio to be associated with an increase in the need for fiscal adjustment and, therefore, the likelihood of a large, extended surplus. Consistent with this presumption we find that debt-to-GDP ratios tend to be higher during episodes of high and persistent primary surpluses. The difference with the control group, however, is statistically significant only for one of our nine definitions of what constitutes a large and persistent episode.[14]

Primary surplus episodes seem to be associated with depreciated exchange rates (consistent with the finding that primary surpluses are associated with current account surpluses, and consistent with the idea that depreciation is useful for crowding in exports in periods of fiscal consolidation).[15] In contrast, there is no indication that large, persistent primary surpluses are more or less likely in periods of high unemployment or inflation.[16] There is some indication that sustained primary surpluses are more likely in countries with faster population growth. In contrast, there is no evident correlation between financial development and primary surpluses.[17]

We also examined whether the incidence of large and persistent primary surpluses is associated with countries' political characteristics (Table 7). In one instance there is a statistically significant difference in the likelihood of a large primary surplus episode between countries with presidential and parliamentary forms of government.

[13] Aficionados of the literature on global imbalances will recognize this as the twin-deficits hypothesis in another guise. It is worth noting that among all our economic and political variable, the current account balance is probably the most endogenous with respect to primary surplus episodes.

[14] Celasum, Debrun and Ostry (2006) look at a panel of annual data (as opposed to five year periods, as year) and the level or change in the primary balance (as opposed to whether the primary balance exceeds 3 percent, as here) and find that a high debt-to-GDP ratio is positively associated with the primary balance (as here).

[15] Again, the difference with the control group is statistically significant only in one case.

[16] We consider these two variables because a high unemployment rate may increase the political costs of a fiscal adjustment and above average inflation may reduce the need to a running a primary surplus because inflationary surprise may reduce the debt-to-GDP ratio.

[17] As expected, the government overall balance is higher during episodes of high and persistent primary surplus.

Interestingly, primary surplus episodes are more likely with left-of-the-center governments, contrary to the findings of the literature analyzing the political determinants of short-term budget balances (Roubini and Sachs 1989a,b).[18] Note, however, that subsequent literature (e.g. Cusack 1999) suggests that such partisan differences have attenuated over time and that they are contingent on current economic conditions (including, plausibly, the debt situation considered here). In addition, it has been suggested (by inter alia Persson and Svensson, 1989) that right-wing governments with a preference for low public expenditure and therefore low taxes may prefer high debts to commit their left-wing successors to those policies; right-wing governments, behaving strategically, may therefore be less inclined to commit to sustained large primary surpluses.

In the simple univariate comparisons of Table 7, primary surplus episodes are more likely if the governmental party controls all houses of congress or parliament, but the difference is statistically significant for only one of our nine definitions of an episode. We find no statistically significant effect of democracy and electoral rules (first-past-the-post elections, proportional representation, and average district magnitude), nor any effect linked to the vote share of government parties or government fractionalization and polarization. Some of these variables show signs of importance in multivariate comparisons, however, to which we now turn.

4.2 Multivariate analysis

We now analyze the relationship between large and persistent primary surpluses and the economic and political variables discussed above using probit regressions, where the dependent variable takes a value of one during surplus episodes and zero in control periods. The probit model is non-linear and its coefficients should be interpreted as the effect of an infinitesimal change in the explanatory variables on the likelihood of

[18] Although, again, the difference is statistically significant only in one of our nine definitions of a large and persistent primary surplus episode.

observing the episode. We concentrate on 3 percent, 5-year episodes, but also consider other thresholds and period lengths.

Economic Variables

Table 8, which focuses on economic variables, indicates that GDP growth, the debt-to-GDP ratio, the current account balance, and GDP per capita are significantly correlated with the likelihood of a sustained primary surplus (Table 8, column 1). The point estimates suggest that a one percentage point increase in domestic growth is associated with a 7.8 percentage point increase in the likelihood of a primary surplus. (This compares with the unconditional likelihood of a primary surplus episode of the current magnitude which, in our sample, is about 15 percent.). A ten percentage point increase in the debt-to-GDP ratio is instead associated with a 1.4 percentage point increase in the likelihood of a primary surplus episodes (in our sample, the standard deviation of the debt-to-GDP ratio is 33). A one percentage point increase in the current account balance is associated with a 1.5 percentage point increase in the likelihood of a primary surplus episode.

Again, one should be cautious in interpreting these patterns, since the probit model is nonlinear and the preceding calculations are linear approximations which may not hold for large variations in the explanatory variables. Still these findings are suggestive for the challenges facing Eurozone countries like Italy. With unfavorable demographics and low productivity growth, GDP growth rates much above the 1.3-1.5 percent rates seen before the crisis seem unlikely.[19] The swing in the current account balance from deficit before the crisis (-1.4 percent of GDP in 2006-07) to surplus now (+1.1 percent in 2014-15) increases the likelihood of a surplus episode by about 3 percent, according to our estimates. That Italy is a high savings country works in its favor, to put the point another way. Unfortunately from this point of view, Italy's

[19] The IMF provides forecasts of global growth through 2019: at less than 4 percent per annum, this is a full percentage point slower than in the heyday of 2004-07 and 2010 (reflecting an anticipated moderation in growth in emerging market and developing countries and possible problems of secular stagnation in the advanced economies).

current account surplus is forecast to narrow and disappear at the end of the present decade. The main economic factor pointing to the likelihood of large, persistent primary surpluses is the high debt ratio – that Italy will have to run them, ruling out other approaches to the problem, in order for that debt to be sustainable.

In columns 2-4 of Table 8 we drop two variables (the real exchange rate and the debt-to-GDP ratio) that limit our sample in terms of observations; the results do not change. The results are also similar if we limit our analysis to a sample of advanced economies. In this case we obtain a larger effect of domestic growth and of the debt ratio and find that the current account balance is no longer statistically significant (Table 9).

As we noted above, the correlation between primary surplus episodes and GDP per capita is both robust and puzzling. It may be that GDP per capita is capturing the effect of institutional quality and that strong institutions are necessary to support long and persistent fiscal surpluses. Strong institutions may make for better tax compliance. They may make it easier for governments and societies to make credible commitments to maintaining a policy, such as the policy of retiring public debt, over extended periods. Consistent with this presumption, if we augment our regressions with an index of institutional quality (the ICRG indicator of quality of government, QOG, obtained as the mean of the ICRG's control of corruption, law and order, and bureaucratic quality measures), GDP per capita is no longer statistically significant. In any case, opinions will differ as to whether Europe's crisis countries (our motivation), notwithstanding their high per capita GDP, should be regarded as countries where the relevant institutions are strong. Note, moreover, that the interpretation that stronger institutions support persistent primary surpluses required to accomplish fiscal adjustments is not fully satisfactory, insofar as countries with strong institutions should be less likely to need a fiscal adjustment in the first place.

It is possible, however, that the correlation between persistent surpluses and income per capita (as a proxy for the strength of institutions) reflects the fact that when a country with good institutions receives a positive wealth shock it saves the windfall and runs a series of large surpluses (for example, Norway, Singapore and New Zealand

are three of our episodes of large and persistent primary surpluses). In this case, the adjustment is not associated with the need to restore debt sustainability; rather it reflects optimal fiscal smoothing. We test this hypothesis by interacting the level of debt with income per capita and check whether the link between GDP per capita and primary surplus episodes is stronger in countries with low levels of debt.

Figure 2 confirms that this is the case. The relationship between GDP per capita and the probability of a fiscal adjustment is statistically significant only in periods when public debt is less than 80 percent of GDP. At the same time, only countries with income per capita above $7,500 react to high debt levels with a persistent primary surplus.

Political and Institutional Variables

In Table 10 we examine more closely at political and institutional correlates of primary surplus episodes. Column 1 shows that surplus episodes are less likely with right-wing governments and more likely in proportional systems and when the government party controls all houses of parliament or congress. In addition, we find a positive association between the likelihood of a persistent fiscal surplus on the one hand and either government fractionalization or polarization on the other (where polarization is defined as the maximum difference between the chief executive's party's economic orientation and the values of the three largest government parties and the largest opposition party). These latter results are surprising, but we will see that they are not robust. In contrast, the results are robust to dropping democracy and district magnitude, variables that limit the sample size (column 2).

If we limit the sample to advanced economies (column 3), the effect of proportional voting is stronger than in the full sample. While Milesi-Ferretti, Perotti and Rostagno (2002) find that primary spending tends to be higher in countries with proportional systems, Atkinson, Rainwater and Smeeding (1995) have shown that countries with proportional representation typically exhibit higher average tax rates.

They show as well that proportional systems are associated with more even distributions of post-tax incomes, making widespread sharing of the burden of debt reduction easier.

Our results suggest that there are country-periods in which the latter effect dominates the former. The knock on proportional systems is that they can give rise to party proliferation and government fractionalization, which makes sustaining policy more difficult. Given that our regressions control for government fractionalization, this observation does not necessary contradict theories suggesting that proportional representation is conducive to fractionalization, which gives rise to gridlock and wars of attrition.[20]

Synthesis

We now consider economic and political variables together. In the full sample, the likelihood of an extended primary surplus episode is positively associated with GDP growth, the debt-to-GDP ratio, and the log of GDP per capita. The significant political variables are the dummy indicating that the government controls all relevant houses of congress or parliament and the economic orientation of the government. As before, we find that primary surplus episodes are less likely with right wing governments (column 1 of Table 11).

In the next four columns of Table 11 we drop the variables with missing observations that limit sample size (proportional representation, economic orientation of the government, and debt-to-GDP ratio). The results are robust to the expanded samples, except that we do not always find a statistically significant effect of the variable that indicates that the government controls all relevant houses.[21]

[20] However, the result is robust to dropping fractionalization from the model, indicating that our findings are strongly consistent with the view that proportional systems encourage the construction of encompassing coalitions that makes compromise possible.

[21] While most of the results of Table 12 are robust to controlling for the current account balance, the debt-to-GDP ratio tends to lose statistical significance when we control for the current account balance. We decided to drop the current account balance because, among all our controls, this is the variable with the most serious endogeneity issue.

In Table 12, we estimate the models of Table 11 restricting the sample to advanced economies. The results are similar, except that we now find a statistically significant and robust effect of proportional representation. The contrast with Table 11 suggests that any positive effect of proportional representation is limited mainly to the advanced economies (we provide more details on this result below).

We also check the robustness of our results by estimating the model of Table 11 for all the countries with income per capita greater than $2000 and for which we have data (i.e., we go beyond our advanced and emerging economies sample – for a full list of episodes see Tables A5-A7 in the Appendix). The results, in Table 13, show more evidence of a positive correlation between primary surplus episodes and GDP growth, the debt-to-GDP ratio, GDP per capita, and the economic orientation of the government.[22]

In the full sample, proportional representation is never statistically significant. This result confirms what we found in Tables 11 and 12 (i.e., proportional representation is robustly associated with primary surplus only in advanced economies) and suggests that proportional representation works well in countries where institutions are strong, but does not make a difference (or may even have negative effects) in countries with poor institutions. We test this hypothesis by interacting proportional representation with either income per capita or the quality of government index. Consistent with the above, the effect of proportional representation is only positive and statistically significant for countries with either high income per capita or high institutional quality, and it is negative (and statistically significant in the case of quality of government) in countries with low institutional quality or income per capita (Figure 3).

We also ran regressions like those reported in Tables 8-13 using higher thresholds for the primary surplus and length of the episode. Table 14 shows the results for a model similar to that of column 1 of Table 11. When we look at 5 year episodes with 4 percent thresholds (column 1 of Table 14), we find that only GDP growth, GDP

[22] Tables 11-13 did not control for world growth because this variable is never statistically significant (including world growth in the regressions would not alter the results).

per capita and proportional representation remain significantly correlated with primary surplus episodes. However, the proportional representation dummy is no longer statistically significant when we consider 5 percent five-year episodes (column 2). Looking at eight-year 3 and 4 percent episodes (columns 3 and 4), we obtain results which are similar to those of five-year 4 and 5 percent episodes, but in this case we again find a significant effect of the "all-houses" dummy, suggesting that governments that have control of all relevant houses are more likely to be able to implement long-lasting fiscal consolidation programs.

No robust correlations are evident when we consider the drivers of eight-year five percent episodes. This is not surprising as that there is only a small handful of such episodes and we cannot even estimate our probit model. The only variables that are correlated with ten-year 3 percent episodes are GDP growth, GDP per capita, and the "all-housea" dummy (column 5). Similarly, none of our economic or political variables is significantly correlated with ten-year 4 percent episodes (column 6). As in the case of eight-year episodes, we cannot estimate the determinants of 10-year 5 percent episodes because we only have three of such episodes.

Episodes with an average surplus which is either larger than 3 percent and that lasts more than 8 years appear to be special and idiosyncratic in the sense that none of our economic and political variables helps to explain their incidence.

5 Exceptions

We have shown that large, persistent primary surpluses – especially surpluses as large and persistent as those prescribed by the IMF's debt sustainability analyses of Europe and the EU's Fiscal Compact, which in some cases show that achieving debt targets will require surpluses of 5 percent of GDP or more for periods as long as ten years – are rare. That it is difficult to identify correlates of these episodes suggests that they are politically and economically idiosyncratic. In this section we therefore consider the episodes in question in more detail.

The three ten-year episodes of 5+ percent primary surpluses in our sample are Belgium starting in 1995, Norway starting in 1999, and Singapore starting in 1990. The Belgian case was associated with the convergence criteria for qualifying for monetary union. Those criteria included a debt-to-GDP ratio of no more than 60 percent of GDP or rapidly converging to that level; Belgium in the mid-1990s had a debt ratio roughly twice that high. Thus, large primary surpluses were needed to signal the country's European partners that it was committed to bringing its debt ratio down toward Maastricht-compliant levels. It is revealing that primary budget surpluses of this magnitude did not persist much after the country's entry into the Eurozone in 1999.

This explanation for Belgium's large primary surpluses begs the question of why other European countries in its position, Italy for example, which also entered the 1990s with debts significantly in excess of the Maastricht criterion, did not behave similarly. IMF (2011) points to the role played by institutional reforms put in place by Belgium in the 1980s in anticipation of the need to sustain large primary surpluses. Belgium reformed its tax code in the mid-1980s (enlarging the tax base and lowering top marginal income tax rates) and rationalized its system of fiscal federalism at the end of the decade (constraining spending by regional governments). It empowered the Federal Planning bureau to issue nonpartisan, independent forecasts of the budget in the mid-1990s, and restructured the High Finance Council to give it a clear mandate to monitor and coordinate fiscal policies between the federal and regional levels. It is hard to identify similar institutional reforms in Italy. The timing of the Belgian exception (including the fact that the large primary surpluses disappear after the turn of the century while institutional reforms do not) points to the importance of exceptional circumstances (like the Maastricht deadline) and strong institutions *in combination* as the explanation for the exception.

Norway's primary surpluses are associated with the peak in North Sea oil production and the operations of the country's petroleum fund. Production in the Norwegian sector of the North Sea nearly doubled in the 1980s and remained elevated before declining after 1993. The Government Petroleum Fund (previously the Petroleum Fund and now part of the Government Pension Fund) was created to husband

these revenues from peak oil for future generations. Budget surpluses associated with oil revenues were paid into the fund starting in the 1990s.

As in Belgium, the practice was encouraged by the development of strong budgeting institutions. Budget documents refer to the non-oil deficit, making transparent the dependence of revenues on natural resources and encouraging a long-term approach to budgeting. The government adopted a guideline for fiscal policy stating that the structural non-oil deficit may not exceed 4 per cent of total financial assets in the Government Pension Fund, reflecting the assumption that the long run return on the assets of the pension fund is 4 per cent.[23] As we write, Norway's general government primary balance is still in substantial surplus, but it is declining as a share of GDP (along with oil revenues)

Singapore has run budget surpluses as a way of building up a reserve to insure against volatility. The economy is small and lacking in natural resources. Its status as an entrepot center has come under challenge from Hong Kong and now Mainland China, and the financial and pharmaceutical sectors to which it has turned are volatile. It is exposed geopolitically, and its relations with its Malaysian neighbor have not always been the best.[24]

All this has caused the government to prioritize accumulating surpluses in its sovereign wealth funds, the Government Investment Corporation, which invests globally, and Temasek Holdings, whose holdings are mainly local and regional. In addition, since 1992 a small portion of the surplus has also been invested in the Edusave Endowment Fund and the Medical Endowment Fund, interest earnings from which were used to finance the future growth of social expenditures.[25]

The structure of governance in Singapore, with its strong executive, strong bureaucracy, and strong fiscal rules, enables the government to commit to persistent

[23] See Jafarov and Leigh (2007).

[24] In the words of Shanmugaratnam (2008), "...A country's reserves are a key asset in a globalised and uncertain world. But they are especially valuable for a country completely lacking in natural resources, extremely open to the world, and very small in size in a region of large players. Our reserves are our only resource besides our people, and a major strategic advantage for Singapore."

[25] As Bercuson (1995) explains, allocations to the funds are not classified as current expenditures but as allocations of the budget surplus.

surpluses (Blondal 2006). The government has consistently issued conservative growth forecasts that understate revenues, while coming under relatively little pressure to correct those forecasts and increase spending accordingly (Abeysinghe and Jayawickrama 2008). Insofar as the institutions and circumstances of Singapore are special, it is not clear to what extent its ability to run large, persistent surpluses carries over to other countries.

We also have two additional cases of countries that have run surpluses of at least 4 per cent of GDP for as long as ten years: Ireland starting in 1991 and New Zealand starting in 1994. These cases are similarly worth considering for their exceptional nature, although it is important to emphasize that surpluses of "merely" 4 per cent will not be enough for the most heavily indebted Eurozone countries to work down their debts to targeted levels.

Ireland's experience in the 1990s is widely pointed to by observers who insist that Eurozone countries can escape their debt dilemma by running large, persistent primary surpluses. Ireland's move to large primary surpluses was taken in response to an incipient debt crisis: after a period of deficits as high as 8 per cent of GDP, general government debt as a share of GDP reached 110 per cent in 1987. A new government then slashed public spending by 7 per cent of GDP, abolishing some long-standing government agencies, and offered a one-time tax amnesty to delinquents. The result was faster economic growth that then led to self-reinforcing favorable debt dynamics, as revenue growth accelerated and the debt-to-GDP ratio declined even more rapidly with the accelerating growth of its denominator. This is a classic case pointed to by those who believe in the existence of expansionary fiscal consolidations (Giavazzi and Pagano 1990).

But it is important, equally, to emphasize that Ireland's success in running large primary surpluses was supported by special circumstances. The country was able to devalue its currency – an option that is not available to individual Eurozone countries – enabling it sustain growth in the face of large public-spending cuts by crowding in exports. As a small economy, Ireland was in a favorable position to negotiate a national pact (known as the Program for National Recovery) that created confidence that the

burden of fiscal austerity would be widely and fairly shared, a perception that helped those surpluses to be sustained. (Indeed, it is striking that every exception considered in this section is a small open economy.) Global growth was strong in the decade of the 1990s (the role of this facilitating condition is emphasized by Hagemann 2013). Ireland, like Belgium (see above), was under special pressure to reduce its debt-to-GDP ratio in order to meet the Maastricht criteria and qualify for monetary union in 1999. Finally, the country's multinational-friendly tax regime encouraged foreign corporations to book their profits in Ireland, which augmented revenues.

Whether other Eurozone countries – and, indeed, Ireland itself – will be able to pursue a similar strategy in the future is dubious. Thus, while Irish experience has some general lessons for other countries, it also points to special circumstances that are likely to prevent its experience from being generalized.

The case of New Zealand has also been widely analyzed. New Zealand experienced chronic instability in the first half of the 1980s; the budget deficit was 9 per cent of GDP in 1984, while the debt ratio was high and rising. Somewhat in the manner of Singapore, the country's small size and highly open economy heightened the perceived urgency of correcting the resulting problems. New Zealand therefore adopted far-reaching and, in some sense, unprecedented institutional reforms. At the aggregate level, the Fiscal Responsibility Act of 1994 limited the scope for off-budget spending and creative accounting. It required the government to provide Parliament with a statement of its long-term fiscal objectives, a forecast of budget outcomes, and a statement of fiscal intentions explaining whether its budget forecasts were consistent with its budget objectives. It required prompt release of aggregate financial statements and regular auditing, using internationally accepted accounting practices.

At the level of individual departments, the government set up a management framework that imposed strong separation between the role of ministers (political appointees who specified departmental objectives) and departmental CEOs (civil servants with leeway to choose tactics appropriate for delivering outputs). This separation was sustained by separating governmental departments into narrowly-focused policy ministries and service-delivery agencies, and by adopting procedures

that emphasized transparency, employing private-sector financial reporting and accounting rules, and by imposing accountability on technocratic decision makers (Mulgan 2004).

As a result of these initiatives, New Zealand was able to cut public spending by more than 7 per cent of GDP. Revenues were augmented by privatization receipts, as political opposition to privatization of public services was successfully overcome. The cost of delivering remaining public services was limited by comprehensive deregulation that subjected public providers to private competition. The upshot was more than a decade of 4+% primary surpluses, allowing the country to halve its debt ratio from 71 per cent of GDP in 1995 to 30 per cent in 2010.

An extensive literature discusses whether New Zealand-style reforms can be readily translated to other countries. Its conclusions are mixed.[26] The consensus, insofar as there is one, is that countries with exceptionally strong rule of law, low levels of corruption and strong institutions and markets are in the best position to emulate its example.

The New Zealand case may be the most encouraging one we have for the sustainability of Eurozone debts. It suggests that 4+% surpluses for a decade are not inconceivable; they are most likely for relatively small, open economies with strong institutional capacity and an appetite for radical reform. That said, it is worth observing that it took full ten years from the implementation of the first reforms, in 1984, to the emergence of 4+% budget surpluses in New Zealand a decade later.[27]

6 Conclusion

For the debts of Europe's problem countries to be sustainable, absent restructuring, foreign aid or an unanticipated burst of inflation, their governments will have to run large primary budget surpluses, in many cases in excess of 5 percent of GDP, for periods as long as 10 years. History suggests that such behavior, while not entirely

[26] See Schick (1998) for a skeptical view and Bale and Dale (1998) for a balanced assessment.
[27] On the chronology, see Rudd and Roper (1997).

unknown, is exceptional. Countries that have run such large surpluses for such extended periods have faced exceptional circumstances. Even applying more moderate criteria (primary budget surpluses of 3 percent for at least 5 years), such behavior is unusual. Sustained surplus episodes are more likely when growth is strong, the current account of the balance of payments is in surplus (savings rates are high), the debt-to-GDP ratio is high (heightening the urgency of fiscal adjustment), and the governing party controls all houses of parliament or congress (its bargaining position is strong). Historically, left wing governments have been more likely to run large, persistent primary surpluses. In advanced countries, proportional representation electoral systems that give rise to encompassing coalitions are associated with surplus episodes.

On balance, this analysis does not leave us optimistic that Europe's crisis countries will be able to run primary budget surpluses as large and persistent as officially projected.

References

Abbas, S. Ali, Bernardin Akitoby, Jochen Andritzky, Helge Berger, Takuji Komatsuzaki and Justin Tyson (2014), "Reducing Public Debt when Growth is Slow, " Washington, D.C.: IMF

Abbeysinghe, Tilak and Ananda Jayawickrama (2008), "Singapore's Recurrent Budget Surplus: The Role of Conservative Growth Forecasts," *Journal of Asian Economics* 19, pp. 117-124.

Atkinson, Anthony, L. Rainwater and T. Smeeding (1995), "Income Distribution in European Countries," Working Paper no. 9535, Department of Applied Economics, University of Cambridge.

Bakem Nakcikm and Tony Dale (1998), "Public Sector Reform in New Zealand and its Relevance to Developing Countries," *World Bank Research Observer* 13, pp.103-121.

Bacchiocchi, Emanuele, Elisa Borghi, and Alessandro Missale (2011), "Public Investment under Fiscal Constraints," *Fiscal Studies* 32(1), pp. 11-42.

Bercuson, Kenneth (1995), "Singapore: A Case Study in Rapid Development," Washington, D.C: IMF.

Blondal, Jon (2006), "Budgeting in Singapore," *OECD Journal on Budgeting* 6, pp. 46-85.

Borensztein, Eduardo, Kevin Cowan, and Patricio Valenzuela (2013), "Sovereign Ceilings "Lite"? The Impact of Sovereign Ratings on Corporate Ratings," *Journal of Banking and Finance* 37(11), pp. 4014-4024.

Celasun, Oya, Xavier Debrun and Jonathan Ostry (2006), "Primary Surplus Behavior and Risks to Fiscal Sustainability in Emerging Market Countries: A 'Fan-Chart' Approach," IMF Working Paper WP/06/67.

Cole, Harold and Timothy Kehoe (2000), "Self-Fulfilling Debt Crises," *Review of Economic Studies* 67, pp. 91-116.

Cusack, Thomas (1999), "Partisan Politics and Fiscal Policy," *Comparative Political Studies* 32, pp. 464-496.

De Grauwe, Paul (2011), "The Governance of a Fragile Eurozone," CEPS Working Documents.

De Grauwe, Paul and Yuemei Ji (2013), "Self-Fulfilling Crises in the Eurozone: An Empirical Test," *Journal of International Money and Finance* 34, pp. 15–36.

De Haan, Jakob, Richard Jong-A-Pin, and Jochen Mierau (2013), "Do Budgetary Institutions Mitigate the Common Pool Problem? New Evidence for the EU," *Public Choice* 156, pp. 423-441.

Dell'Erba, Salvatore, Ricardo Hausmann, and Ugo Panizza (2013), "Debt Levels, Debt Composition, and Sovereign Spreads in Emerging and Advanced Economies," *Oxford Review of Economic Policy* 29(3), pp. 518-547.

Eichengreen, Barry, Ricardo Hausmann, and Ugo Panizza (2005), "The Pain of Original Sin," in B. Eichengreen and R. Hausmann (eds.) *Other People's Money*, Chicago: University of Chicago Press.

Giavazzi, Francesco and Marco Pagano (1990), "Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries," *NBER Macroeconomics Annual 1990*, pp.75-122.

Hagemann, Robert (2013), "Fiscal Rules for Ireland," unpublished manuscript.

International Monetary Fund (2002) "Assessing Sustainability," Policy paper prepared by the Policy Review and Development Department, May 28, 2002. Washington, D.C.: IMF.

International Monetary Fund (2013), *Fiscal Monitor*, Washington, D.C: IMF (April).

Jafarov, Eibar and Daniel Leigh (2007), "Alternative Fiscal Rules for Norway," *IMF Country Report* no. 07/197, Washington, D.C.: IMF, pp.17-43.

Kiel Institute of World Economics (2014), "Kiel Institute Barometer of Public Debt," http://www.ifw-kiel.de/think-tank/policy-support/the-kiel-institute-barometer-of-public-debt/the-kiel-institute-barometer-of-public-debt/?searchterm=primary%20surplus (March).

Krugman, Paul (1989), "Financing vs. Forgiving a Debt Overhang," NBER Working Paper no. 2486.

Mauro, Paolo, Rafael Romeu, Ariel Binder and Asad Zaman (2013), "A Modern History of Fiscal Prudence and Profligacy," IMF Working Paper No. 13/5, International Monetary Fund, Washington, DC

Milesi-Ferretti, Gian Maria, Roberto Perotti, and Massimo Rostagno (2002), "Electoral Systems and Public Spending," *Quarterly Journal of Economics* 117(2), pp. 609-657.

Mendoza, Enrique (2003), "An Analytical Review of Public Debt Sustainability Analysis and its Implication for Emerging Markets," Unpublished, University of Maryland.

Mody, Ashoka (2014) "The Italian Fault Line," Brussels: Bruegel, http://www.bruegel.org/nc/blog/detail/article/1345-the-italian-fault-line/

Morris, Steve and Hyun Shin (1998), "Unique Equilibrium in a Model of Self-Fulfilling Currency Attacks," *American Economic Review* 88, pp. 587-597.

Mulgan, Richard (2004), "Public Sector Reform in New Zealand: Issues of Public Accountability," Asian Pacific School of Economics and Government Discussion Paper no.04/03, Canberra: ANU.

Panizza, Ugo (2014) "Public Debt Risks in Italy: Myths, Facts, and Policies," Unpublished, Graduate Institute, Geneva

Panizza, Ugo and Andrea F. Presbitero (2013). "Public Debt and Economic Growth in Advanced Economies: A Survey," *Swiss Journal of Economics and Statistics* 149(II), pp. 175-204.

Panizza, Ugo and Andrea F. Presbitero (2014). "Public Debt and Economic Growth: Is There a Causal Effect?" *Journal of Macroeconomics* 41, pp. 21-41.

Persson, Torsten and Lars Svensson (1989), "Why a Stubborn Conservative Would Run a Deficit: Policy with Time-Inconsistent Preferences," *Quarterly Journal of Economics* 104, pp. 325-345.

Pescatori, Andrea, Damiano Sandri and John Simon (2014), "Debt and Growth: Is There a Magic Threshold?" IMF Working Paper WP/14/34.

Reinhart, Carmen and Kenneth Rogoff (2013), "Financial and Sovereign Debt Crises: Some Lessons Learned and Those Forgotten," IMF Working Paper no.WP/13/266.

Roubini, Nouriel and Jeffrey Sachs (1989), "Government Spending and Budget Deficits in the Industrial Countries," *Economic Policy* 8, pp.98-131.

Roubini, Nouriel and Jeffrey Sachs (1989), "Political and Economic Determinants of Budget Deficits in the Industrial Democracies," *European Economic Review* 33, pp. 9803-938.

Rudd, Chris and Brian Roper (1997), *The Political Economy of New Zealand*, 2nd edition, Oxford: Oxford University Press.

Sachs, Jeffrey (1989), "Conditionality, Debt Relief and the Developing Country Debt Crisis," in Jeffrey Sachs (ed.), *Developing Country Debt and Economic Performance, Volume 1: The International Financial System*, Chicago: University of Chicago Press, pp. 255-296.

Schick, Allen (1998), "Why Most Developing Countries Should Not Try New Zealand's Reforms," *World Bank Research Observer* 13, pp.122-131.

Shanmugaratnam, Tharmin (2008), "Second Reading Speech for Constitution of Republic of Singapore (Amendment) Bill 2008," http://app.mof.gov.sg/data/Second_Reading_Speech_Constitution_Bill.pdf

Standard & Poor's (2012), "Standard & Poor's Takes Various Rating Actions on 16 Eurozone Sovereign Governments," Ratings Direct, on the global direct portal Standard & Poor's.

Table 1: Public Debt in G7 Countries (2012)

	Gross Public Debt		Net Public Debt
	Millions	% of GDP	% of GDP
USA	€12'934'000	102.4%	80.1%
Japan	€10'962'000	237.3%	129.5%
Germany	€ 2'160'000	81.1%	58.1%
Italy	€ 1'990'000	127.0%	106.1%
France	€ 1'834'000	90.2%	84.0%
UK	€ 1'712'000	88.6%	81.4%
Canada	€ 1'248'000	88.2%	36.7%

Source: WEO Database, April 2014

Table 2: Fiscal Adjustment Strategy to Achieve Debt Target by 2030

Country	Cyclically adjusted primary balance over 2020-30
Belgium	3.8%
France	2.9%
Greece	7.2%
Ireland	5.6%
Italy	6.6%
Japan	7.3%
Portugal	5.9%
Spain	4.0%
United Kingdom	4.2%
United States	4.1%
Average for advanced economies	3.6%
Average for G20 advanced economies	3.8%
Average for Emerging Market Economies	0.5%

Source: IMF (2013). Tables 13a and 13b.

Table 3: Nonoverlapping primary surplus episodes, 5-year periods

3% of GDP		4% of GDP		5% of GDP	
BEL1998	5.97	BEL1998	5.97	BEL1998	5.97
BRA2004	3.58	CAN1997	5.05	CAN1997	5.05
CAN1997	5.05	CHL2004	5.33	CHL2004	5.33
CHL1991	3.54	DNK1985	5.49	DNK1985	5.49
CHL2004	5.33	DNK2004	4.76	IRL1996	5.34
DNK1985	5.49	FIN1998	4.75	NOR1981	5.39
DNK1997	3.50	IRL1988	4.78	NOR2004	13.71
DNK2004	4.76	IRL1996	5.34	NZL1993	5.69
FIN1976	3.39	ITA1996	4.81	PAN1994	6.77
FIN1998	4.75	NOR1981	5.39	SGP1991	12.26
GRC1996	3.91	NOR2004	13.71	SGP2004	6.48
HKG2007	3.23	NZL1993	5.69	SWE1986	5.43
IRL1988	4.78	NZL2002	4.17		
IRL1996	5.34	PAN1994	6.77		
ISL2003	3.71	SGP1991	12.26		
ISR1986	3.14	SGP2004	6.48		
ITA1996	4.81	SWE1986	5.43		
KOR1988	3.16	TUR2002	4.48		
KOR1999	3.77				
LUX1997	3.39				
MEX1991	3.78				
NLD1996	3.48				
NOR1981	5.39				
NOR2004	13.71				
NZL1993	5.69				
NZL2002	4.17				
PAN1994	6.77				
PAN2005	3.35				
PER2004	3.01				
PHL2004	3.47				
SGP1991	12.26				
SGP2004	6.48				
SWE1986	5.43				
SWE1997	3.45				
THA1991	3.65				
TUR2002	4.48				
Average	4.81		6.15		6.91
N. Episodes	36		18		12

The year refers to the beginning of the episode (for instance, in column 1, BEL1998 indicates an episode that starts in 1998 and ends in 2002). The numbers report the average primary surplus over the period.

Table 4: Nonoverlapping primary surplus episodes, 8-year periods

3% of GDP		4% of GDP		5% of GDP	
BEL1997	5.51	BEL1997	5.51	BEL1997	5.51
CAN1997	4.01	CAN1997	4.01	NOR2001	11.57
CHL1991	3.02	DNK1984	4.24	SGP1990	10.93
CHL2001	3.26	DNK2000	4.02	SGP2005	5.84
DNK1984	4.24	FIN2000	4.12		
DNK2000	4.02	IRL1993	4.72		
FIN2000	4.12	ITA1995	4.04		
GRC1994	3.27	NOR2001	11.57		
IRL1993	4.72	NZL1993	4.46		
ITA1995	4.04	SGP1990	10.93		
KOR1995	3.38	SGP2005	5.84		
NOR2001	11.57	TUR1999	4.11		
NZL1993	4.46				
SGP1990	10.93				
SGP2005	5.84				
SWE1984	3.82				
TUR1999	4.11				
Average	**4.96**		**5.63**		**8.46**
N. Episodes	**17**		**12**		**4**

The year refers to the beginning of the episode (for instance, in column 1, BEL1997 indicates an episode that starts in 1997 and ends in 2003). The numbers report the average primary surplus over the period.

Table 5: Nonoverlapping primary surplus episodes, 10-year periods

3% of GDP		4% of GDP		5% of GDP	
BEL1995	5.19	BEL1995	5.19	BEL1995	5.19
CAN1996	3.72	IRL1991	4.70	NOR1999	11.07
DNK1984	3.44	NOR1999	11.07	SGP1990	9.30
DNK1999	3.97	NZL1994	4.14		
FIN1999	3.95	SGP1990	9.30		
IRL1991	4.70				
ITA1993	3.60				
KOR1993	3.33				
NOR1999	11.07				
NZL1994	4.14				
SGP1990	9.30				
TUR1999	3.74				
Average	5.01		6.88		8.52
N. Episodes	12		5		3

The year refers to the beginning of the episode (for instance, in column 1, BEL1995 indicates an episode that starts in 1995 and ends in 2004). The numbers report the average primary surplus over the period.

Table 6: Economic variables during large and persistent primary surplus episodes

	Five-year episodes			Eight-year Five-year episodes			Ten-year Five-year episodes		
	3%	**4%**	**5%**	**3%**	**4%**	**5%**	**3%**	**4%**	**5%**
	GDP Growth (%)								
Control	2.74	2.99	2.98	3.04	3.11	3.05	2.90	2.92	2.95
Episode	4.78	4.33	4.64	3.99	3.75	4.20	3.60	4.42	3.79
Diff.	-2.03	-1.34	-1.66	-0.95	-0.64	-1.15	-0.70	-1.51	-0.83
p-value	**0.00**	**0.02**	**0.01**	**0.05**	0.27	0.29	0.19	**0.07**	0.43
	GDP per capita (USD)								
Control	23'239	22'701	23'015	22'653	21'957	22'936	23'265	24'054	24'222
Episode	24'645	28'774	29'442	26'926	32'534	39'328	30'765	34'077	38'959
Diff.	-1'405	-6'073	-6'427	-4'273	-10'577	-16'392	-7'500	-10'023	-14'737
p-value	0.60	**0.10**	0.15	0.28	**0.02**	**0.05**	0.11	0.15	**0.09**
	World GDP Growth (%)								
Control	2.74	2.75	2.76	2.79	2.79	2.79	2.79	2.80	2.81
Episode	3.05	3.13	3.12	3.04	3.07	2.85	2.97	2.89	2.92
Diff.	-0.31	-0.39	-0.36	-0.26	-0.28	-0.06	-0.18	-0.09	-0.11
p-value	**0.01**	**0.02**	**0.06**	**0.00**	**0.00**	0.70	**0.00**	0.27	0.29
	Current account balance (% of GDP)								
Control	-1.40	-1.19	-1.13	-1.44	-1.44	-1.30	-0.98	-0.80	-0.87
Episode	1.34	2.82	3.97	1.83	3.17	10.46	3.10	5.94	10.70
Diff.	-2.74	-4.01	-5.10	-3.27	-4.61	-11.75	-4.09	-6.74	-11.57
p-value	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**
	Debt over GDP (%)								
Control	52.81	51.91	52.43	46.88	47.51	50.26	51.97	52.29	52.95
Episode	53.96	62.10	61.82	58.17	66.84	73.94	62.68	66.71	75.09
Diff.	-1.15	-10.20	-9.39	-11.29	-19.33	-23.68	-10.71	-14.42	-22.14
p-value	0.85	0.21	0.34	0.14	**0.04**	0.18	0.26	0.31	0.23
	RER (% deviation from average)								
Control	1.39	1.60	1.60	1.32	1.29	1.31	1.50	1.56	1.58
Episode	1.56	1.84	1.82	2.00	1.71	1.24	2.03	1.90	1.25
Diff.	-0.18	-0.25	-0.22	-0.67	-0.42	0.07	-0.53	-0.33	0.33
p-value	0.66	0.84	0.88	**0.09**	0.59	0.96	0.63	0.83	0.86
	Unemployment rate (%)								
Control	7.18	7.01	7.13	6.78	6.75	7.01	6.76	6.80	6.86
Episode	6.51	7.19	5.98	6.95	7.15	4.50	7.00	6.47	4.64
Diff.	0.67	-0.18	1.14	-0.17	-0.40	2.51	-0.24	0.32	2.22
p-value	0.38	0.86	0.35	0.86	0.73	0.25	0.82	0.84	0.28
	Inflation (%)								
Control	5.66	5.57	5.59	5.82	5.86	5.56	5.53	5.35	5.30
Episode	5.29	4.35	4.14	5.29	4.82	3.07	4.47	2.92	3.09
Diff.	0.37	1.22	1.44	0.53	1.03	2.49	1.06	2.43	2.21
p-value	0.72	0.36	0.39	0.71	0.53	0.38	0.53	0.30	0.46
	Credit to the private sector (% of GDP)								
Control	88.47	86.34	86.17	85.34	82.56	82.49	91.14	89.80	88.68
Episode	80.13	80.67	80.81	78.27	82.48	79.64	81.07	82.07	80.02
Diff.	8.35	5.67	5.36	7.07	0.09	2.84	10.07	7.73	8.65
p-value	0.37	0.65	0.73	0.58	1.00	0.92	0.50	0.73	0.76
	Population growth (%)								
Control	0.71	0.77	0.76	0.76	0.76	0.74	0.81	0.78	0.78
Episode	1.05	0.99	1.20	0.86	0.84	1.44	0.83	1.21	1.35
Diff.	-0.34	-0.21	-0.44	-0.10	-0.08	-0.70	-0.01	-0.43	-0.57
p-value	**0.02**	0.25	**0.05**	0.63	0.73	0.10	0.95	0.19	0.17
	Government balance (% of GDP)								
Control	-3.58	-3.16	-3.09	-2.93	-2.86	-2.76	-2.97	-2.73	-2.68
Episode	1.95	3.31	5.01	1.32	1.67	8.35	1.46	4.67	7.35
Diff.	-5.53	-6.47	-8.10	-4.26	-4.53	-11.10	-4.43	-7.40	-10.02
p-value	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table 7: Political variables during large and persistent primary surplus episodes

	Five-year episodes			Eight-year Five-year episodes			Ten-year Five-year episodes		
	3%	4%	5%	3%	4%	5%	3%	4%	5%
	Electoral System (Parliamentary=1; Presidential=0)								
Control	0.81	0.77	0.78	0.81	0.78	0.80	0.77	0.79	0.80
Episode	0.71	0.89	0.83	0.81	1.00	1.00	0.92	1.00	1.00
Diff.	0.10	-0.12	-0.05	-0.01	-0.22	-0.20	-0.14	-0.21	-0.20
p-value	0.19	0.22	0.65	0.95	**0.07**	0.39	0.25	0.24	0.38
	Economic Ideology of the Government (Right=1; Left=3; Center=2)								
Control	1.87	1.91	1.93	1.91	1.94	1.93	1.90	1.91	1.91
Episode	2.13	2.00	1.82	2.08	1.76	1.38	1.84	1.53	1.30
Diff.	-0.26	-0.09	0.11	-0.17	0.17	0.55	0.06	0.39	0.61
p-value	**0.09**	0.67	0.68	0.40	0.47	0.28	0.77	0.26	0.20
	Does party of executive control all relevant houses? (1=yes)								
Control	0.22	0.22	0.22	0.20	0.23	0.23	0.21	0.22	0.22
Episode	0.27	0.36	0.38	0.38	0.35	0.33	0.33	0.26	0.33
Diff.	-0.05	-0.14	-0.17	-0.19	-0.13	-0.10	-0.12	-0.04	-0.11
p-value	0.53	0.15	0.16	**0.07**	0.30	0.66	0.30	0.84	0.62
	Plurality (1= first past the post rule)								
Control	0.54	0.54	0.52	0.54	0.56	0.55	0.59	0.56	0.55
Episode	0.49	0.44	0.50	0.50	0.36	0.33	0.41	0.40	0.33
Diff.	0.05	0.09	0.02	0.04	0.20	0.21	0.18	0.16	0.22
p-value	0.56	0.44	0.87	0.77	0.20	0.47	0.23	0.48	0.45
	Proportional representation (1=yes)								
Control	0.80	0.82	0.83	0.81	0.81	0.81	0.79	0.80	0.80
Episode	0.83	0.78	0.67	0.75	0.82	0.67	0.83	0.80	0.67
Diff.	-0.03	0.04	0.17	0.06	0.00	0.15	-0.05	0.00	0.13
p-value	0.71	0.64	0.14	0.55	0.97	0.53	0.72	0.98	0.57
	Average Distrct Magnitude, House								
Control	38.94	35.42	33.98	43.37	39.14	35.39	34.81	31.49	30.34
Episode	12.14	8.73	7.99	8.17	8.99	8.34	8.96	10.87	8.49
Diff.	26.80	26.69	25.98	35.20	30.15	27.05	25.86	20.62	21.85
p-value	0.26	0.38	0.47	0.34	0.47	0.72	0.49	0.70	0.75
	Average Distrct Magnitude, Senate								
Control	333.44	319.34	323.17	311.30	289.42	324.03	313.54	322.29	335.34
Episode	327.52	446.99	447.99	299.50	447.75	13.00	447.75	450.50	13.00
Diff.	5.91	-127.66	-124.82	11.80	-158.33	311.03	-134.21	-128.21	322.34
p-value	0.96	0.47	0.56	0.95	0.46	NA	0.54	0.68	NA
	Vote share of Government Parties								
Control	42.60	42.57	42.89	44.08	43.90	44.11	43.05	43.26	43.52
Episode	44.34	45.91	45.28	45.48	46.95	52.58	46.42	49.46	51.42
Diff.	-1.74	-3.34	-2.39	-1.40	-3.05	-8.46	-3.38	-6.20	-7.91
p-value	0.59	0.44	0.64	0.73	0.50	0.31	0.47	0.37	0.36
	Herfindahl Index Government								
Control	0.71	0.70	0.69	0.70	0.71	0.71	0.71	0.71	0.71
Episode	0.69	0.75	0.75	0.69	0.66	0.57	0.66	0.63	0.57
Diff.	0.02	-0.05	-0.05	0.01	0.05	0.14	0.05	0.08	0.14
p-value	0.65	0.40	0.50	0.93	0.55	0.36	0.55	0.50	0.35
	Government Fractionalization								
Control	0.30	0.31	0.31	0.30	0.30	0.29	0.30	0.30	0.29
Episode	0.32	0.25	0.26	0.31	0.35	0.43	0.34	0.37	0.43
Diff.	-0.02	0.05	0.05	-0.01	-0.05	-0.14	-0.05	-0.08	-0.14
p-value	0.65	0.40	0.50	0.93	0.55	0.35	0.55	0.50	0.35
	Polarization between the executive party and the four principal parties of the legislature								
Control	1.02	1.02	1.05	1.04	1.03	1.05	0.98	1.01	1.04
Episode	1.07	1.16	1.05	1.17	1.26	1.33	1.27	1.42	1.33
Diff.	-0.05	-0.14	0.00	-0.13	-0.23	-0.29	-0.29	-0.41	-0.29
p-value	0.73	0.50	0.99	0.54	0.36	0.54	0.22	0.25	0.52
	Democracy Index								
Control	9.26	9.18	9.20	9.23	9.19	9.27	9.20	9.23	9.27
Episode	8.84	9.06	8.84	9.14	9.11	7.91	9.06	8.72	7.89
Diff.	0.42	0.12	0.36	0.10	0.08	1.37	0.14	0.51	1.38
p-value	0.17	0.77	0.44	0.82	0.87	0.13	0.77	0.48	0.12

Table 8: Primary surpluses and Economic Variables (advanced economies and emerging markets)

	(1)	(2)	(3)	(4)
Pop growth	0.0519	0.0323	0.0712*	0.0468
	(0.0450)	(0.0344)	(0.0416)	(0.0318)
GDP Growth	0.0776***	0.0672***	0.0729***	0.0616***
	(0.0196)	(0.0157)	(0.0188)	(0.0148)
Log(infl)	0.0122	0.0140	0.00434	0.00554
	(0.0280)	(0.0237)	(0.0271)	(0.0224)
Debt-to-GDP	0.00139*	0.00134*		
	(0.00071)	(0.000803)		
Credit to priv. sect.	-0.000567	-0.000635	-0.000636	-0.000736
	(0.000798)	(0.000675)	(0.000803)	(0.000674)
Current acc. bal.	0.0154**	0.0116**	0.0161**	0.0119**
	(0.00689)	(0.00554)	(0.00690)	(0.00557)
Log(GDP PC)	0.114***	0.0888***	0.118***	0.0888***
	(0.0367)	(0.0297)	(0.0374)	(0.0301)
Unemployment	0.00290	0.000731	0.00595	0.00340
	(0.00696)	(0.00584)	(0.00709)	(0.00594)
World GDP growth	2.528	1.444	3.735	2.475
	(4.349)	(3.591)	(4.243)	(3.503)
RER	-0.00179		-0.00294	
	(0.0123)		(0.0120)	
Observations	189	219	189	219
Sample	AE&EM	AE&EM	AE&EM	AE&EM

Probit Regressions, the dependent variable takes value one for five year episodes with a primary surplus of at least 3% of GDP. The table reports the marginal effects estimated at the mean of the dependent variable. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 9: Primary surpluses and Economic Variables (advanced economies)

	(1)	(2)	(3)	(4)
Pop growth	-0.109	-0.0826	-0.0884	-0.0717
	(0.0491)	(0.0335)	(0.0534)	(0.0365)
GDP Growth	0.124***	0.0876***	0.120***	0.0853***
	(0.0254)	(0.0200)	(0.0259)	(0.0195)
Log(infl)	-0.00817	0.000696	-0.0187	-0.0103
	(0.0453)	(0.0301)	(0.0456)	(0.0311)
Debt-to-GDP	0.00204*	0.00157**		
	(0.00116)	(0.000766)		
Credit to priv. sect.	-0.000626	-0.000436	-0.000818	-0.000637
	(0.000871)	(0.000608)	(0.000926)	(0.000657)
Current acc. bal.	0.00704	0.00450	0.00938	0.00597
	(0.00651)	(0.00427)	(0.00697)	(0.00487)
Log(GDP PC)	0.238***	0.149***	0.243***	0.145**
	(0.0807)	(0.0522)	(0.0855)	(0.0573)
Unemployment	-0.00150	-0.00275	0.00442	0.00134
	(0.00719)	(0.00495)	(0.00755)	(0.00534)
World GDP growth	2.242	0.912	3.840	2.040
	(4.518)	(3.152)	(4.611)	(3.270)
RER	-0.00742		-0.00947	
	(0.0111)		(0.0112)	
Observations	132	161	132	161
Sample	Adv. Economies	Adv. Economies	Adv. Economies	Adv. Economies

Probit Regressions, the dependent variable takes value one for five year episodes with a primary surplus of at least 3% of GDP. The table reports the marginal effects estimated at the mean of the dependent variable. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 10: Primary Surpluses and Political Variables (advanced economies and emerging markets)

	(1)	(2)	(3)	(4)
Pol. Syst.	-0.0773	-0.0833	-0.0407	-0.0407
	(0.0568)	(0.0606)	(0.0930)	(0.0997)
Ec. Orient	0.0767***	0.0721**	0.0617*	0.0664**
	(0.0297)	(0.0305)	(0.0337)	(0.0336)
Allhouse	0.161*	0.139*	0.226**	0.217**
	(0.0832)	(0.0815)	(0.0939)	(0.0894)
Plurality	0.00528	0.00925	-0.0564	-0.0638
	(0.0575)	(0.0606)	(0.0681)	(0.0678)
Proportional	0.109**	0.0743	0.142***	0.144***
	(0.0511)	(0.0618)	(0.0428)	(0.0427)
Numvote	-0.000156	-0.00137	0.000215	-4.65e-05
	(0.00157)	(0.00162)	(0.00220)	(0.00183)
Fract.	0.189	0.299**	0.0807	0.119
	(0.116)	(0.127)	(0.155)	(0.149)
Polariz.	0.0646*	0.0231	0.0691*	0.0491
	(0.0350)	(0.0375)	(0.0407)	(0.0411)
Democracy	-0.0214		-0.00497	
	(0.0230)		(0.0292)	
Log(ADM)	-0.0186		-0.00266	
	(0.0157)		(0.0145)	
Observations	192	204	149	160
Sample	AE&EM	AE&EM	Adv. Ec.	Adv. Ec.

Probit Regressions, the dependent variable takes value one for five year episodes with a primary surplus of at least 3% of GDP. The table reports the marginal effects estimated at the mean of the dependent variable. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 11: Primary Surpluses, Economic and Political Variables (advanced economies and emerging markets)

	(1)	(2)	(3)	(4)	(5)
GDP Growth	0.0695***	0.0724***	0.0634***	0.0632***	0.0686***
	(0.0137)	(0.0123)	(0.0128)	(0.0136)	(0.0119)
Debt-to-GDP	0.00122**	0.00103*		0.00138**	
	(0.000620)	(0.000530)		(0.000655)	
Log(GDP PC)	0.0682**	0.0710***	0.0647**	0.0744**	0.0698***
	(0.0280)	(0.0260)	(0.0286)	(0.0294)	(0.0267)
Proportional	0.0693	0.0654	0.0762		0.0633
	(0.0427)	(0.0397)	(0.0464)		(0.0406)
Ec. Orient	0.0744***		0.0694**	0.0674**	
	(0.0271)		(0.0270)	(0.0283)	
Allhouse	0.113*	0.0926	0.129*	0.0590	0.100
	(0.0665)	(0.0609)	(0.0696)	(0.0649)	(0.0630)
Fract.	0.170	0.0700	0.181	0.200**	0.0691
	(0.0959)	(0.0837)	(0.0998)	(0.0960)	(0.0866)
Observations	203	229	203	206	229
Sample	AE&EM	AE&EM	AE&EM	AE&EM	AE&EM

Probit Regressions, the dependent variable takes value one for five year episodes with a primary surplus of at least 3% of GDP. The table reports the marginal effects estimated at the mean of the dependent variable. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 12: Primary Surpluses, Economic and Political Variables (advanced economies)

	(1)	(2)	(3)	(4)
GDP Growth	0.0540***	0.0701***	0.0507***	0.0672***
	(0.0159)	(0.0151)	(0.0153)	(0.0148)
Debt-to-GDP	0.000830*	0.000973*		
	(0.000502)	(0.000540)		
Log(GDP PC)	0.118**	0.150***	0.123**	0.155***
	(0.0501)	(0.0502)	(0.0504)	(0.0537)
Proportional	0.0976***	0.0955***	0.113***	0.107***
	(0.0340)	(0.0334)	(0.0328)	(0.0339)
Ec. Orient	0.0641***		0.0646***	
	(0.0213)		(0.0222)	
Allhouse	0.133**	0.103	0.183***	0.150**
	(0.0623)	(0.0638)	(0.0603)	(0.0651)
Fract.	0.123	0.0431	0.159*	0.0638
	(0.0833)	(0.0900)	(0.0898)	(0.0948)
Observations	160	172	160	172
Sample	Adv. Ec	Adv. ec	Adv. ec	Adv. Ec

Probit Regressions, the dependent variable takes value one for five year episodes with a primary surplus of at least 3% of GDP. The table reports the marginal effects estimated at the mean of the dependent variable. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 13: Primary Surpluses, Economic and Political Variables (all countries with GDP per capita of at least USD2000 PPP)

	(1)	(2)	(3)	(4)	(5)
GDP Growth	0.0510***	0.0513***	0.0533***	0.0380***	0.0437***
	(0.0112)	(0.0112)	(0.0101)	(0.00986)	(0.00920)
Debt-to-GDP	0.00144**	0.00145**	0.00117*		
	(0.000710)	(0.000710)	(0.000625)		
Log(GDP PC)	0.0342	0.0338	0.0449*	0.0294	0.0422*
	(0.0276)	(0.0275)	(0.0247)	(0.0279)	(0.0245)
Proportional	0.0297		0.0649	0.0266	0.0461
	(0.0573)		(0.0513)	(0.0571)	(0.0494)
Ec. Orient	0.0609**	0.0623**		0.0539**	
	(0.0272)	(0.0273)		(0.0260)	
Allhouse	0.0496	0.0405	0.0697	0.0580	0.0696
	(0.0600)	(0.0586)	(0.0540)	(0.0602)	(0.0530)
Fract.	0.116	0.129	0.0254	0.149	0.0572
	(0.104)	(0.0996)	(0.0902)	(0.101)	(0.0880)
Observations	232	232	268	250	232
Sample	All countries	All countries	All countries	All countries	All countries

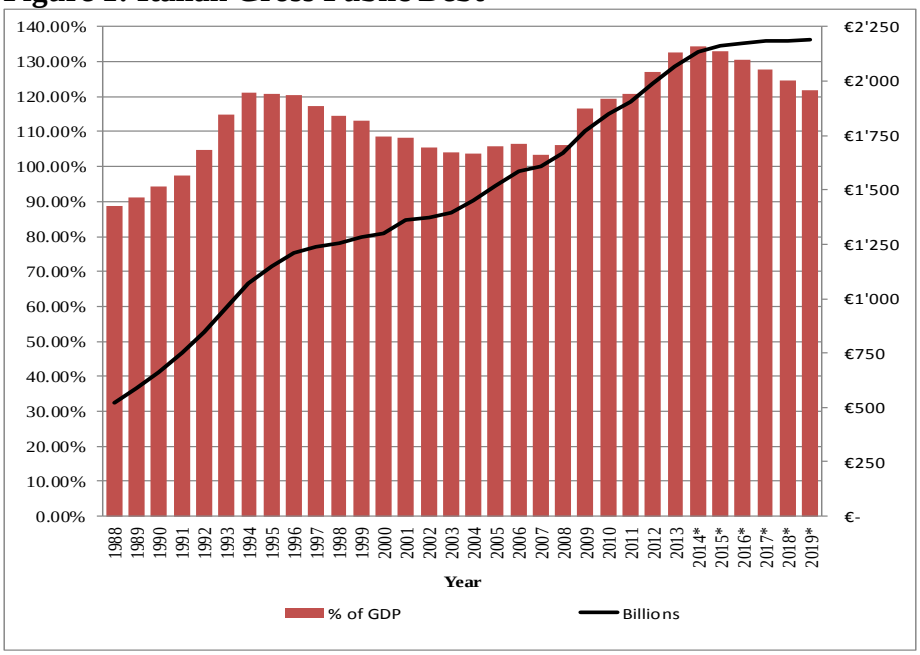
Probit Regressions, the dependent variable takes value one for five year episodes with a primary surplus of at least 3% of GDP. The table reports the marginal effects estimated at the mean of the dependent variable. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 14: Primary Surpluses, Economic and Political Variables (different thresholds and time lengths)

	(1)	(2)	(3)	(4)	(5)	(6)
GDP Growth	0.0246***	0.0149**	0.0461**	0.0185*	0.0555**	0.0177
	(0.00838)	(0.00587)	(0.0186)	(0.00970)	(0.0225)	(0.0164)
Debt-to-GDP	0.000649	0.000354	0.000865	0.000542	0.000758	0.000335
	(0.000417)	(0.000240)	(0.000775)	(0.000373)	(0.000810)	(0.000268)
Log(GDP PC)	0.107***	0.0616**	0.164**	0.108**	0.153**	0.0510
	(0.0386)	(0.0272)	(0.0702)	(0.0524)	(0.0722)	(0.0472)
Proportional	0.0531**	0.0126	0.129***	0.0298	0.0701	
	(0.0270)	(0.0242)	(0.0469)	(0.0263)	(0.0522)	
Ec. Orient	0.0183	0.00155	0.0484	0.000867	0.0215	-0.00917
	(0.0197)	(0.0132)	(0.0361)	(0.0167)	(0.0372)	(0.0110)
Allhouse	0.0432	0.0249	0.292***	0.107*	0.194*	0.0145
	(0.0517)	(0.0306)	(0.0932)	(0.0592)	(0.0993)	(0.0392)
Fract.	0.00312	0.0267	0.159	0.123*	0.242	0.0535
	(0.0716)	(0.0418)	(0.121)	(0.0653)	(0.220)	(0.0585)
Observations	171	178	91	100	79	69
Sample	AE&EM	AE&EM	AE&EM	AE&EM	AE&EM	AE&EM
Length	5 years	5 years	8 years	8 years	10 years	10 years
Threshold	4%	5%	3%	4%	3%	4%

Probit Regressions, the dependent variable takes value one for episodes of length X with a primary surplus above the threshold. The table reports the marginal effects estimated at the mean of the dependent variable. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Figure 1: Italian Gross Public Debt



Source: WEO database (April 2014). *IMF forecasts

Figure 2: Marginal effect of GDP per capita at different level of public debt and marginal effect of debt at different levels of GDP per capita.

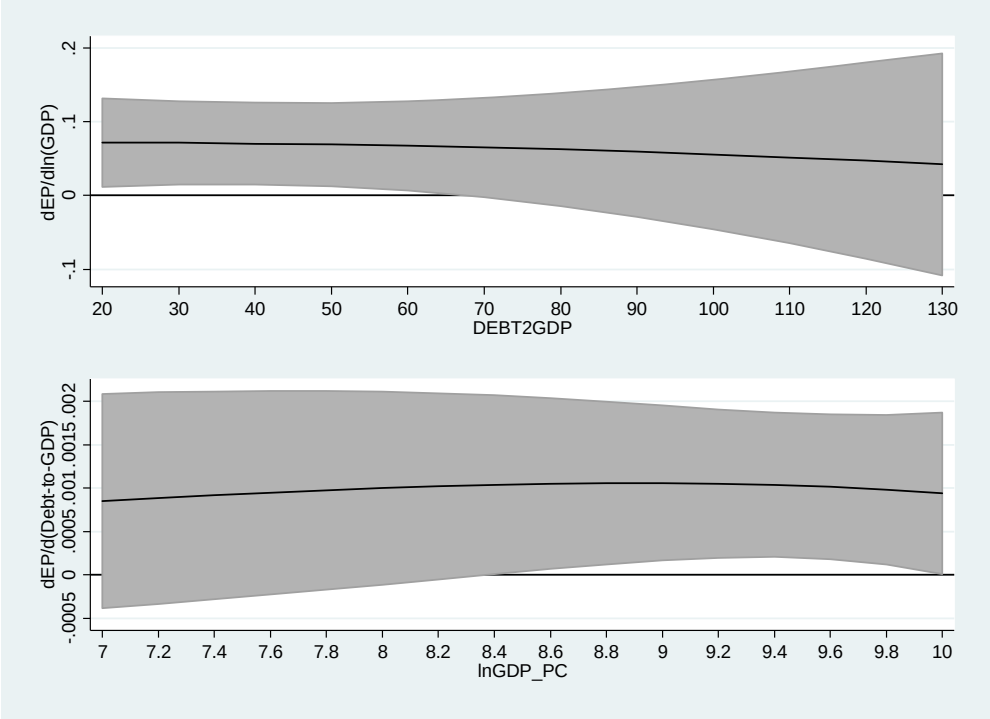


Figure 3: Marginal effect of proportional representation at different levels of GDP per capita and quality of government

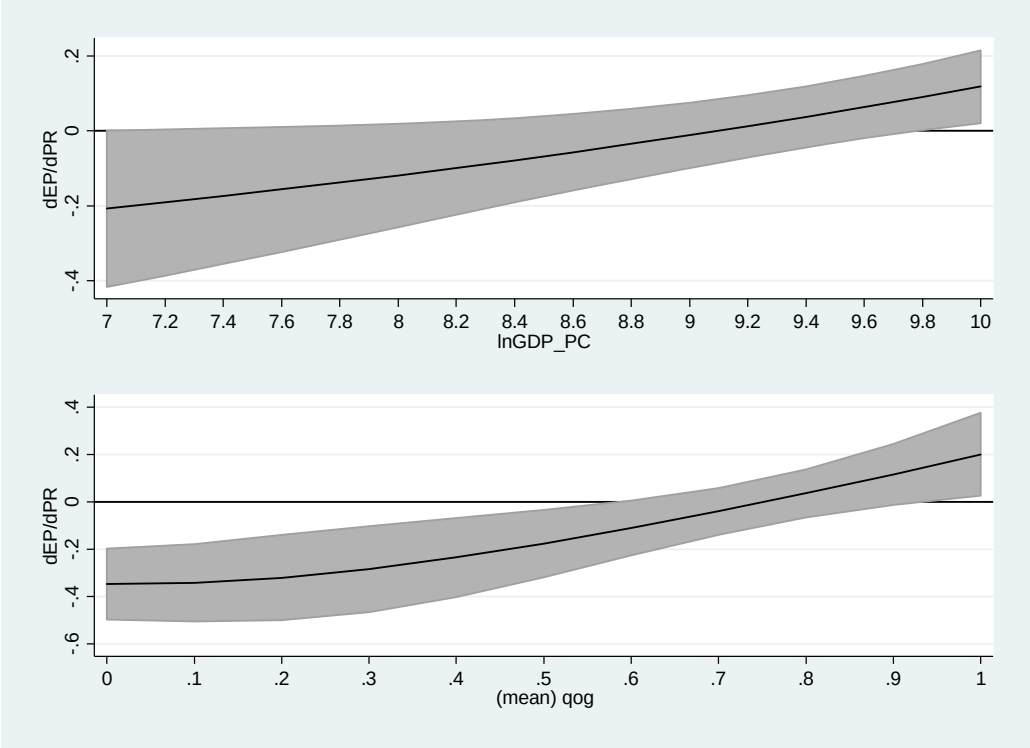


Table A1: Country-years included in the sample

Country	First obs.	Last Obs.	Country	First obs.	Last Obs.
ARG	1992	2013	ISR	1986	2013
AUS	1974	2013	ITA	1974	2013
AUT	1974	2013	JPN	1974	2013
BEL	1974	2013	KOR	1974	2013
BRA	1996	2013	LBN	2000	2012
CAN	1974	2013	LTU	2000	2013
CHE	1974	2013	LUX	1990	2013
CHL	1991	2013	LVA	1996	2013
CHN	1991	2011	MEX	1991	2011
COL	1991	2013	NLD	1974	2013
CRI	1991	2013	NOR	1974	2013
CYP	2000	2012	NZL	1974	2013
CZE	1996	2013	PAN	1991	2013
DEU	1974	2013	PER	1993	2013
DNK	1974	2013	PHL	1997	2013
ECU	1991	1994	POL	1996	2013
ESP	1974	2013	PRT	1974	2013
EST	1996	2013	RUS	2006	2013
FIN	1974	2013	SGP	1990	2013
FRA	1974	2013	SVK	1996	2013
GBR	1974	2013	SVN	1996	2013
GRC	1974	2013	SWE	1974	2013
HKG	2002	2013	THA	1991	2013
IDN	1991	2011	TUR	1991	2013
IND	1991	2013	URY	2010	2013
IRL	1974	2013	USA	1974	2013
ISL	1974	2013	ZAF	2006	2013

Table A2: Overlapping primary surplus episodes, 5-year periods

3% of GDP						4% of GDP				5% of GDP	
BEL1989	3.06	HKG2006	3.20	NZL1993	5.69	BEL1994	4.52	SGP1990	11.90	BEL1996	5.44
BEL1990	3.18	HKG2007	3.23	NZL1994	5.41	BEL1995	4.97	SGP1991	12.26	BEL1997	5.93
BEL1991	3.11	IRL1987	4.05	NZL1995	4.48	BEL1996	5.44	SGP1992	12.03	BEL1998	5.97
BEL1992	3.28	IRL1988	4.78	NZL1996	3.51	BEL1997	5.93	SGP1993	11.30	BEL1999	5.73
BEL1993	3.86	IRL1989	4.75	NZL2000	3.44	BEL1998	5.97	SGP1994	8.51	BEL2000	5.42
BEL1994	4.52	IRL1990	4.53	NZL2001	3.86	BEL1999	5.73	SGP1995	6.69	CAN1997	5.05
BEL1995	4.97	IRL1991	4.07	NZL2002	4.17	BEL2000	5.42	SGP1996	6.03	CHL2004	5.33
BEL1996	5.44	IRL1992	3.92	NZL2003	4.14	BEL2001	4.47	SGP1997	5.03	DNK1984	5.22
BEL1997	5.93	IRL1993	4.13	NZL2004	3.55	BEL2002	4.01	SGP1999	4.73	DNK1985	5.49
BEL1998	5.97	IRL1994	4.44	PAN1991	4.97	CAN1996	4.82	SGP2000	4.73	DNK1986	5.25
BEL1999	5.73	IRL1995	4.58	PAN1992	5.45	CAN1997	5.05	SGP2001	4.44	FIN1974	5.23
BEL2000	5.42	IRL1996	5.34	PAN1993	5.70	CAN1998	4.57	SGP2002	4.99	FIN1975	6.08
BEL2001	4.47	IRL1997	4.99	PAN1994	6.77	CHL2003	4.60	SGP2003	6.44	FIN1976	5.19
BEL2002	4.01	IRL1998	4.13	PAN1995	3.85	CHL2004	5.33	SGP2004	6.48	IRL1996	5.34
BEL2003	3.67	IRL1999	3.36	PAN2005	3.35	DNK1984	5.22	SGP2005	5.17	NOR1981	5.39
BEL2004	3.20	ISL2003	3.71	PAN2006	3.21	DNK1985	5.49	SGP2006	5.03	NOR1982	5.20
BRA1999	3.28	ISR1986	3.14	PER2004	3.01	DNK1986	5.25	SGP2007	5.46	NOR1996	6.31
BRA2000	3.40	ITA1993	3.32	PHL2003	3.07	DNK2003	4.41	SGP2008	4.80	NOR1997	7.62
BRA2001	3.48	ITA1994	3.87	PHL2004	3.47	DNK2004	4.76	SGP2009	4.90	NOR1998	7.77
BRA2002	3.44	ITA1995	4.43	PHL2005	3.17	FIN1998	4.75	SWE1985	4.52	NOR1999	8.43
BRA2003	3.46	ITA1996	4.81	SGP1990	11.90	FIN1999	4.59	SWE1986	5.43	NOR2000	9.37
BRA2004	3.58	ITA1997	4.62	SGP1991	12.26	FIN2000	4.41	SWE1987	5.08	NOR2001	9.25
BRA2005	3.24	ITA1998	3.87	SGP1992	12.03	IRL1987	4.05	TUR2002	4.48	NOR2002	10.19
CAN1995	3.71	ITA1999	3.16	SGP1993	11.30	IRL1988	4.78	TUR2003	4.35	NOR2003	11.66
CAN1996	4.82	KOR1987	3.09	SGP1994	8.51	IRL1989	4.75			NOR2004	13.71
CAN1997	5.05	KOR1988	3.16	SGP1995	6.69	IRL1990	4.53			NZL1993	5.69
CAN1998	4.57	KOR1989	3.14	SGP1996	6.03	IRL1991	4.07			NZL1994	5.41
CAN1999	3.96	KOR1990	3.10	SGP1997	5.03	IRL1993	4.13			PAN1992	5.45
CAN2000	3.28	KOR1992	3.02	SGP1998	3.94	IRL1994	4.44			PAN1993	5.70
CHL1991	3.54	KOR1993	3.02	SGP1999	4.73	IRL1995	4.58			PAN1994	6.77
CHL1992	3.34	KOR1996	3.14	SGP2000	4.73	IRL1996	5.34			SGP1990	11.90
CHL1993	3.10	KOR1997	3.32	SGP2001	4.44	IRL1997	4.99			SGP1991	12.26
CHL2003	4.60	KOR1998	3.64	SGP2002	4.99	IRL1998	4.13			SGP1992	12.03
CHL2004	5.33	KOR1999	3.77	SGP2003	6.44	ITA1995	4.43			SGP1993	11.30
CHL2005	3.97	KOR2000	3.53	SGP2004	6.48	ITA1996	4.81			SGP1994	8.51
DNK1983	3.70	LUX1997	3.39	SGP2005	5.17	ITA1997	4.62			SGP1995	6.69
DNK1984	5.22	LUX1998	3.07	SGP2006	5.03	NOR1974	4.17			SGP1996	6.03
DNK1985	5.49	MEX1991	3.78	SGP2007	5.46	NOR1976	4.21			SGP1997	5.03
DNK1986	5.25	MEX1992	3.26	SGP2008	4.80	NOR1977	4.31			SGP2003	6.44
DNK1987	3.90	NLD1996	3.48	SGP2009	4.90	NOR1978	4.36			SGP2004	6.48
DNK1996	3.10	NLD1997	3.41	SWE1984	3.58	NOR1979	4.75			SGP2005	5.17
DNK1997	3.50	NOR1974	4.17	SWE1985	4.52	NOR1980	4.85			SGP2006	5.03
DNK1998	3.43	NOR1975	4.00	SWE1986	5.43	NOR1981	5.39			SGP2007	5.46
DNK1999	3.18	NOR1976	4.21	SWE1987	5.08	NOR1982	5.20			SWE1986	5.43
DNK2000	3.00	NOR1977	4.31	SWE1997	3.45	NOR1983	4.88			SWE1987	5.08
DNK2001	3.31	NOR1978	4.36	SWE1998	3.29	NOR1996	6.31				
DNK2002	3.82	NOR1979	4.75	THA1991	3.65	NOR1997	7.62				
DNK2003	4.41	NOR1980	4.85	THA1992	3.24	NOR1998	7.77				
DNK2004	4.76	NOR1981	5.39	THA1993	3.02	NOR1999	8.43				
DNK2005	3.62	NOR1982	5.20	TUR1999	3.84	NOR2000	9.37				
FIN1976	3.39	NOR1983	4.88	TUR2000	3.38	NOR2001	9.25				
FIN1977	3.01	NOR1984	3.70	TUR2001	3.23	NOR2002	10.19				
FIN1997	3.96	NOR1995	3.88	TUR2002	4.48	NOR2003	11.66				
FIN1998	4.75	NOR1996	6.31	TUR2003	4.35	NOR2004	13.71				
FIN1999	4.59	NOR1997	7.62	TUR2004	3.64	NZL1992	4.95				
FIN2000	4.41	NOR1998	7.77			NZL1993	5.69				
FIN2001	3.34	NOR1999	8.43			NZL1994	5.41				
FIN2003	3.09	NOR2000	9.37			NZL1995	4.48				
FIN2004	3.30	NOR2001	9.25			NZL2002	4.17				
GRC1994	3.24	NOR2002	10.19			NZL2003	4.14				
GRC1995	3.61	NOR2003	11.66			PAN1991	4.97				
GRC1996	3.91	NOR2004	13.71			PAN1992	5.45				
GRC1997	3.54	NZL1991	3.85			PAN1993	5.70				
GRC1998	3.01	NZL1992	4.95			PAN1994	6.77				

The year refers to the beginning of the episode (for instance, in column 1, ARG2002 indicates an episode that starts in 2002 and ends in 2006). The numbers report the average primary surplus over the period.

Table A3: Overlapping primary surplus episodes, 8-year periods

3% of GDP						4% of GDP				5% of GDP	
BEL1995	5.34	ITA1992	3.38	SGP1990	10.93	BEL1992	4.17	SGP2005	5.84	BEL1994	5.14
BEL1996	5.47	ITA1993	3.86	SGP1991	9.85	BEL1993	4.68	SGP2006	5.71	BEL1995	5.34
BEL1997	5.51	ITA1994	3.95	SGP1992	9.30	BEL1994	5.14	TUR1999	4.11	BEL1996	5.47
BEL1998	5.06	ITA1995	4.04	SGP1993	8.75	BEL1995	5.34	SGP2005	5.84	BEL1997	5.51
BEL1999	4.82	ITA1996	3.80	SGP1994	7.27	BEL1996	5.47	SGP2006	5.71	BEL1998	5.06
BEL2000	4.53	ITA1997	3.46	SGP1995	5.96	BEL1997	5.51	TUR1999	4.11	NOR1978	5.11
BEL2001	4.07	KOR1986	3.02	SGP1996	5.15	BEL1998	5.06			NOR1979	5.13
BRA1999	3.39	KOR1987	3.10	SGP1997	4.74	BEL1999	4.82			NOR1994	5.36
BRA2000	3.42	KOR1988	3.11	SGP1998	4.46	BEL2000	4.53			NOR1995	6.45
BRA2001	3.47	KOR1989	3.02	SGP1999	5.07	BEL2001	4.07			NOR1996	6.94
BRA2002	3.30	KOR1990	3.04	SGP2000	5.80	CAN1996	4.01			NOR1997	7.48
BRA2003	3.19	KOR1993	3.11	SGP2001	5.43	CAN1997	4.01			NOR1998	8.32
BRA2004	3.17	KOR1994	3.13	SGP2002	4.82	DNK1984	4.24			NOR1999	10.07
CAN1994	3.32	KOR1995	3.38	SGP2003	5.14	DNK1985	4.07			NOR2000	11.31
CAN1995	3.83	KOR1996	3.34	SGP2004	5.52	DNK2000	4.02			NOR2001	11.57
CAN1996	4.01	KOR1997	3.11	SGP2005	5.84	FIN2000	4.12			SGP1990	10.93
CAN1997	4.01	KOR1999	3.07	SGP2006	5.71	IRL1987	4.09			SGP1991	9.85
CAN1998	3.73	NOR1974	4.49	SWE1983	3.37	IRL1988	4.37			SGP1992	9.30
CAN1999	3.42	NOR1975	4.17	SWE1984	3.82	IRL1989	4.38			SGP1993	8.75
CHL1991	3.02	NOR1976	4.29	TUR1999	4.11	IRL1990	4.40			SGP1994	7.27
CHL2001	3.26	NOR1977	4.47	TUR2000	3.59	IRL1991	4.42			SGP1995	5.96
DNK1983	3.71	NOR1978	5.11	TUR2001	3.13	IRL1992	4.42			SGP1996	5.15
DNK1984	4.24	NOR1979	5.13	TUR2002	3.18	IRL1993	4.72			SGP1999	5.07
DNK1985	4.07	NOR1980	4.72			IRL1994	4.53			SGP2000	5.80
DNK1986	3.53	NOR1981	3.97			IRL1995	4.14			SGP2001	5.43
DNK1997	3.09	NOR1982	3.24			ITA1995	4.04			SGP2003	5.14
DNK1998	3.52	NOR1993	3.46			NOR1974	4.49			SGP2004	5.52
DNK1999	3.88	NOR1994	5.36			NOR1975	4.17			SGP2005	5.84
DNK2000	4.02	NOR1995	6.45			NOR1976	4.29			SGP2006	5.71
DNK2001	3.87	NOR1996	6.94			NOR1977	4.47				
DNK2002	3.16	NOR1997	7.48			NOR1978	5.11				
FIN1976	4.36	NOR1998	8.32			NOR1979	5.13				
FIN1997	3.55	NOR1999	10.07			NOR1980	4.72				
FIN1998	3.85	NOR2000	11.31			NOR1994	5.36				
FIN1999	3.92	NOR2001	11.57			NOR1995	6.45				
FIN2000	4.12	NZL1988	3.39			NOR1996	6.94				
FIN2001	3.57	NZL1989	3.82			NOR1997	7.48				
GRC1994	3.27	NZL1990	4.03			NOR1998	8.32				
GRC1995	3.06	NZL1991	4.04			NOR1999	10.07				
IRL1986	3.39	NZL1992	4.20			NOR2000	11.31				
IRL1987	4.09	NZL1993	4.46			NOR2001	11.57				
IRL1988	4.37	NZL1994	4.24			NZL1990	4.03				
IRL1989	4.38	NZL1995	3.84			NZL1991	4.04				
IRL1990	4.40	NZL1996	3.42			NZL1992	4.20				
IRL1991	4.42	NZL1997	3.26			NZL1993	4.46				
IRL1992	4.42	NZL1998	3.31			NZL1994	4.24				
IRL1993	4.72	NZL1999	3.47			PAN1993	4.11				
IRL1994	4.53	NZL2000	3.64			PAN1994	4.93				
IRL1995	4.14	NZL2001	3.45			SGP1990	10.93				
IRL1996	3.99	PAN1991	3.96			SGP1991	9.85				
IRL1997	3.78	PAN1992	3.89			SGP1992	9.30				
IRL1998	3.43	PAN1993	4.11			SGP1993	8.75				
IRL1999	3.20	PAN1994	4.93			SGP1994	7.27				
BEL1995	5.34	ITA1992	3.38			SGP1995	5.96				
BEL1996	5.47	ITA1993	3.86			SGP1996	5.15				
BEL1997	5.51	ITA1994	3.95			SGP1997	4.74				
BEL1998	5.06	ITA1995	4.04			SGP1998	4.46				
BEL1999	4.82	ITA1996	3.80			SGP1999	5.07				
BEL2000	4.53	ITA1997	3.46			SGP2000	5.80				
BEL2001	4.07	KOR1986	3.02			SGP2001	5.43				
BRA1999	3.39	KOR1987	3.10			SGP2002	4.82				
BRA2000	3.42	KOR1988	3.11			SGP2003	5.14				
BRA2001	3.47	KOR1989	3.02			SGP2004	5.52				
BRA2002	3.30	KOR1990	3.04								

Table A4: Overlapping primary surplus episodes, 10-year periods

3% of GDP						4% of GDP		5% of GDP	
BEL1987	3.04	ITA1993	3.60	TUR1999	3.74	BEL1990	4.07	BEL1994	5.12
BEL1988	3.39	ITA1994	3.51			BEL1991	4.27	BEL1995	5.19
BEL1989	3.79	ITA1995	3.47			BEL1992	4.60	NOR1994	5.55
BEL1990	4.07	ITA1996	3.16			BEL1993	4.91	NOR1995	6.63
BEL1991	4.27	KOR1987	3.06			BEL1994	5.12	NOR1996	7.78
BEL1992	4.60	KOR1988	3.09			BEL1995	5.19	NOR1997	8.91
BEL1993	4.91	KOR1991	3.04			BEL1996	4.96	NOR1998	9.71
BEL1994	5.12	KOR1992	3.17			BEL1997	4.97	NOR1999	11.07
BEL1995	5.19	KOR1993	3.33			BEL1998	4.82	SGP1990	9.30
BEL1996	4.96	KOR1994	3.22			BEL1999	4.46	SGP1991	9.15
BEL1997	4.97	KOR1995	3.07			IRL1988	4.45	SGP1992	8.53
BEL1998	4.82	NOR1974	4.46			IRL1989	4.59	SGP1993	7.62
BEL1999	4.46	NOR1975	4.42			IRL1990	4.55	SGP1994	6.62
BEL2000	3.66	NOR1976	4.80			IRL1991	4.70	SGP1995	5.71
BRA1998	3.02	NOR1977	4.75			IRL1992	4.45	SGP1996	5.24
BRA1999	3.43	NOR1978	4.62			IRL1993	4.13	SGP1997	5.01
BRA2000	3.32	NOR1979	4.23			NOR1974	4.46	SGP1998	5.19
BRA2001	3.22	NOR1980	3.60			NOR1975	4.42	SGP1999	5.61
BRA2002	3.19	NOR1992	3.43			NOR1976	4.80	SGP2002	5.23
BRA2003	3.08	NOR1993	4.61			NOR1977	4.75	SGP2003	5.62
CAN1994	3.09	NOR1994	5.55			NOR1978	4.62	SGP2004	5.69
CAN1995	3.49	NOR1995	6.63			NOR1979	4.23		
CAN1996	3.72	NOR1996	7.78			NOR1993	4.61		
CAN1997	3.71	NOR1997	8.91			NOR1994	5.55		
CAN1998	3.42	NOR1998	9.71			NOR1995	6.63		
DNK1983	3.18	NOR1999	11.07			NOR1996	7.78		
DNK1984	3.44	NZL1987	3.42			NOR1997	8.91		
DNK1985	3.24	NZL1988	3.75			NOR1998	9.71		
DNK1996	3.20	NZL1989	3.76			NOR1999	11.07		
DNK1997	3.66	NZL1990	3.67			NZL1993	4.13		
DNK1998	3.92	NZL1991	3.68			NZL1994	4.14		
DNK1999	3.97	NZL1992	3.87			SGP1990	9.30		
DNK2000	3.31	NZL1993	4.13			SGP1991	9.15		
FIN1997	3.47	NZL1994	4.14			SGP1992	8.53		
FIN1998	3.92	NZL1995	3.96			SGP1993	7.62		
FIN1999	3.95	NZL1996	3.69			SGP1994	6.62		
FIN2000	3.31	NZL1997	3.48			SGP1995	5.71		
IRL1985	3.03	NZL1998	3.36			SGP1996	5.24		
IRL1986	3.43	NZL1999	3.21			SGP1997	5.01		
IRL1987	3.99	PAN1991	3.62			SGP1998	5.19		
IRL1988	4.45	PAN1992	3.49			SGP1999	5.61		
IRL1989	4.59	PAN1993	3.39			SGP2000	4.95		
IRL1990	4.55	PAN1994	3.84			SGP2001	4.74		
IRL1991	4.70	SGP1990	9.30			SGP2002	5.23		
IRL1992	4.45	SGP1991	9.15			SGP2003	5.62		
IRL1993	4.13	SGP1992	8.53			SGP2004	5.69		
IRL1994	3.90	SGP1993	7.62						
IRL1995	3.74	SGP1994	6.62						
IRL1996	3.70	SGP1995	5.71						
IRL1997	3.65	SGP1996	5.24						
IRL1998	3.18	SGP1997	5.01						
ITA1991	3.17	SGP1998	5.19						
ITA1992	3.50	SGP1999	5.61						
BEL1987	3.04	ITA1993	3.60						
BEL1988	3.39	ITA1994	3.51						
BEL1989	3.79	ITA1995	3.47						
BEL1990	4.07	ITA1996	3.16						
BEL1991	4.27	KOR1987	3.06						
BEL1992	4.60	KOR1988	3.09						
BEL1993	4.91	KOR1991	3.04						
BEL1994	5.12	KOR1992	3.17						
BEL1995	5.19	KOR1993	3.33						
BEL1996	4.96	KOR1994	3.22						
BEL1997	4.97	KOR1995	3.07						

Table A5: Nonoverlapping primary surplus episodes, 5-year periods, all countries

3%				4%		5%	
BEL1998	5.97	NZL1993	4.29	BEL1998	5.97	BEL1998	5.97
BGR1998	3.61	NZL2002	4.17	BWA1990	14.62	BWA1990	14.62
BGR2004	3.51	OMN2004	11.28	CAN1997	5.05	CAN1997	5.05
BHR2004	3.14	PAN1990	4.74	CHL2004	5.33	CHL2004	5.33
BLZ2005	3.43	PAN2005	3.35	DMA2003	4.47	DNK1985	5.49
BRA2004	3.58	PER2004	3.01	DNK1985	5.49	DZA2004	9.44
BWA1990	14.62	QAT2004	12.07	DNK2004	4.76	IRL1996	5.34
CAN1997	5.05	SAU2004	21.52	DZA2004	9.44	JAM1993	6.83
CHL1990	3.67	SGP1991	12.26	ECU1990	4.52	JAM2003	9.11
CHL2004	5.33	SGP2004	6.48	FIN1974	4.69	KNA2009	5.69
DMA2003	4.47	SMR2004	5.70	FIN1998	4.75	KWT2004	18.87
DNK1985	5.49	SWE1986	5.43	IRL1988	4.78	LBY2004	26.35
DNK1997	3.50	SWE1997	3.45	IRL1996	5.34	NOR1981	5.39
DNK2004	4.76	MEX1990	3.62	ITA1996	4.81	NOR2004	13.71
DZA2004	9.44	MYS1993	4.63	JAM1993	6.83	OMN2004	11.28
ECU1990	4.52	NAM2005	4.00	JAM2003	9.11	QAT2004	12.07
FIN1974	4.69	NLD1996	3.48	KAZ2003	4.51	SAU2004	21.52
FIN1998	4.75	NOR1981	5.39	KNA2009	5.69	SGP1991	12.26
GRC1996	3.91	NOR2004	13.71	KWT2004	18.87	SGP2004	6.48
HKG2007	3.23	NZL1993	4.29	LBY2004	26.35	SMR2004	5.70
IRL1988	4.78	NZL2002	4.17	MYS1993	4.63	SWE1986	5.43
IRL1996	5.34	OMN2004	11.28	NOR1981	5.39	SYC1990	10.07
IRN2003	3.60	PAN1990	4.74	NOR2004	13.71	SYC2008	8.00
ISL2003	3.71	PAN2005	3.35	NZL1993	4.29	TTO2004	7.04
ITA1996	4.81	PER2004	3.01	NZL2002	4.17		
JAM1993	6.83	QAT2004	12.07	OMN2004	11.28		
JAM2003	9.11	SAU2004	21.52	PAN1990	4.74		
KAZ2003	4.51	SGP1991	12.26	QAT2004	12.07		
KNA2009	5.69	SGP2004	6.48	SAU2004	21.52		
KOR2000	3.23	SMR2004	5.70	SGP1991	12.26		
KWT2004	18.87	SWE1986	5.43	SGP2004	6.48		
LBY2004	26.35	SWE1997	3.45	SMR2004	5.70		
LUX1997	3.39	SYC1990	10.07	SWE1986	5.43		
MEX1990	3.62	SYC2008	8.00	SYC1990	10.07		
MYS1993	4.63	TTO2004	7.04	SYC2008	8.00		
NAM2005	4.00	TUR2004	3.64	TTO2004	7.04		
NLD1996	3.48	VEN1990	4.20	VEN1990	4.20		
NOR1981	5.39	VEN1990	4.20				
NOR2004	13.71						

Table A6: Nonoverlapping primary surplus episodes, 8-year periods, all countries

3%		4%		5%	
BEL1997	5.51	BEL1997	5.51	BEL1997	5.51
BGR1998	3.30	CAN1997	4.01	DZA2000	8.16
CAN1997	4.01	DNK1984	4.24	LBY2001	18.22
CHL1990	3.50	DNK2000	4.02	NOR2001	11.57
CHL2001	3.26	DZA2000	8.16	SGP1990	10.93
DMA2002	3.24	FIN2000	4.12	SGP2005	5.84
DNK1984	4.24	IRL1993	4.72		
DNK2000	4.02	ITA1995	4.04		
DZA2000	8.16	LBY2001	18.22		
FIN1974	3.77	NOR2001	11.57		
FIN2000	4.12	NZL1993	4.46		
GRC1994	3.27	PAN1990	4.24		
IRL1993	4.72	SGP1990	10.93		
ITA1995	4.04	SGP2005	5.84		
KAZ2005	3.56	TUR1999	4.11		
KNA2006	3.84				
KOR1995	3.06				
LBY2001	18.22				
NOR2001	11.57				
NZL1993	4.46				
PAN1990	4.24				
SGP1990	10.93				
SGP2005	5.84				
SWE1984	3.82				
TUR1999	4.11				

Table A7: Nonoverlapping primary surplus episodes, 10-year periods, all countries

3%		4%		5%	
BEL1995	5.19	BEL1995	5.19	BEL1995	5.19
BGR1998	3.45	DZA1999	7.52	DZA1999	7.52
CAN1996	3.72	IRL1991	4.70	NOR1999	11.07
DNK1984	3.44	NOR1999	11.07	SAU1999	13.43
DNK1999	3.97	NZL1994	4.14	SGP1990	9.30
DZA1999	7.52	SAU1999	13.43		
FIN1999	3.95	SGP1990	9.30		
IRL1991	4.70				
ITA1993	3.60				
KOR1993	3.33				
NOR1999	11.07				
NZL1994	4.14				
PAN1990	3.56				
SAU1999	13.43				
SGP1990	9.30				
TUR1999	3.74				

A8: Data Sources

The *government balance* (primary and total) data *and macroeconomic controls* are from the WEO database (April 2014), OECD economic outlook, World Development Indicator and old issues of the IMF Government Finance Statistics. We first use WEO data, and when WEO data are missing, we complete the dataset with the historical public finance dataset (Mauro et al., 2013), OECD, WDI, and GFS data (in that order). For *public debt*, we use the same sources but also use the historical debt dataset of Abbas et al. All *political and institutional variables* are from the World Bank's DPI dataset, with the exception of the indexes of democracy and quality of government. The index of quality of government is from ICRG and the index of democracy is the average of the freedom house and polity indexes of democracy. Both variables were downloaded from the Quality of Government Dataset at www.qog.pol.gu.se.