

## **HARD WORK, AND FOREIGN HELP – HOW TO SUCCESSFULLY CONDUCT ADJUSTMENT WITH OFFICIAL ASSISTANCE**

*Martin Larch,<sup>\*</sup> Kristin Magnusson Bernard<sup>\*</sup> and Balint Tatar<sup>\*</sup>*

*What is needed for a country to successfully adjust after a crisis episode is a subject of much debate including in the euro area where four out of seventeen countries were in a full economic adjustment programme by end 2013. We identify adjustment needs by a country's decision to approach the IMF for official assistance. We then investigate the factors conducive to successful exit from official assistance during more than 170 adjustment episodes by means of a panel regression framework. We define success as a resumption of real GDP growth and a reduction of government debt. Our econometric results suggest hard work, i.e., policy action such as fiscal adjustment and decisive financial sector repair, play an important role for the probability of a successful exit. We also find that more stringent conditionality, especially in the structural area, increases the chances of success. Supportive external conditions enhance the prospects for a durable and successful exit. These results also hold up when success is instead defined as the ability of the country to finance itself on capital markets.*

### **1 Introduction**

The global economic downturn that started in the summer of 2007 has been the most economically costly since the Great Depression. From its original epicentre in the U.S. financial sector, it quickly spread around the world, leaving plummeting growth and soaring unemployment in its wake. A large number of emerging markets requested financial assistance from the IMF and regional financing sources as market-based financing at affordable terms disappeared. A second wave of the crisis erupted in 2010 as concerns about debt sustainability in the euro area came to the forefront, exacerbated by fears of contagion in a monetary union and the associated detrimental knock-on effects on financial stability. By the end of 2013 four of at the time seventeen euro area countries were in full economic adjustment programmes,<sup>1</sup> an unprecedented situation among advanced economies.

Defining the right adjustment strategy for getting back to a sustainable path became the topic of a heated debate, which largely focused on whether the speed and scope of fiscal adjustment prescribed under the European programmes were excessive (see, in particular, Blanchard and Leigh, 2013). The strategy for repairing the financial sector after systemic banking problems was also heavily criticized, mainly for promoting excessive near-term deleveraging and adding to fiscal vulnerabilities through large recapitalizations with national public funds. The extensive support from the regional central bank was by some considered as a necessary component for preventing liquidity shortages in viable banks to become solvent, while others saw it as delaying necessary

---

<sup>\*</sup> European Commission, Directorate General for Economic and Financial Affairs. Corresponding author: martin.larch@ec.europa.eu

The views expressed in this paper are those of the authors and should not be attributed to the European Commission. We are grateful to Istvan P. Szekely for guidance and support throughout this project, to Uwe Boewer, Servaas Deroose, Zeno Enders, Juergen von Hagen, Paul van den Noord and Peter Pontuch for helpful comments and Salvador Barrios for access to his data set. Valuable suggestions by the participants of the 16th Banca d'Italia Public Finances Workshop in Perugia are also gratefully acknowledged. Jacek Szelozyński and Orhan Chiali provided excellent research assistance. This version: July, 2014.

<sup>1</sup> The 2012-2013 financial sector assistance programme for Spain had a more narrow objective and is not considered as an official crisis programme for the remainder of this paper. Financing arrangements which give access to official financing but are not monitored by means of ex-post conditionality, such as the IMF's Flexible Credit Line, are not included in the analysis as eligibility criteria for such instruments require lack of outright macroeconomic adjustment needs.

action. There were also dissenting views on how to adapt the situation to a lack of exchange rate flexibility in, e.g., Latvia and the euro area programmes.

Formulating an appropriate adjustment strategy always requires a thorough understanding of a country's particular characteristics and the particular environment in which it operates; idiosyncrasies matter. Moreover, euro area countries exhibit features that are very specific; most notably they are part of a monetary union where monetary policy is delegated to the ECB; the official financing made available through the recent EU-IMF supported programmes for euro area countries was much larger than the historical average; and some of the EU-IMF-supported programmes involved countries with very high government debt-to-GDP ratios. Nevertheless, learning some stylized facts from past crisis episodes and trying to build on past experiences is a valid strategy to improve policies going forward and to possibly assess the odds of success of ongoing or recently completed adjustment programmes.

To be useful, any analysis of factors conducive to successful adjustment after a crisis episode requires a systematic benchmark against which that success is evaluated. A first difficulty arises with how to identify a need for adjustment. Banking crises often, but not always, carry such economic costs that adjustment is needed. The same holds for both the speed and magnitude of fiscal adjustment, which might be very gradual if market or official financing continues to flow and debt levels are manageable. This paper makes the assumption that a country requesting an IMF programme is indicative of a significant adjustment need, as well as a certain urgency to advance the process to a considerable degree within a given time period. We consider the political costs of asking for official assistance to be sufficiently high that countries would not request it if adjustment needs were manageable otherwise. We acknowledge that the adjustment needs for countries under IMF programmes vary substantially, including the actual need for financing, and will aim to control for this in our estimations. This choice of sample could potentially bias the results, as countries availing themselves of official assistance might share certain characteristics likely to bias the results and ideally warranting the use of a control group not receiving financial assistance (Przeworski and Vreeland, 2000; Ghosh *et al.*, 2002; Hardoy, 2003; Hutchison, 2004; Atoyian and Conway, 2005; Barro and Lee, 2005; Bas and Stone, 2011). The economic situation might be worse, which would reduce the likelihood of a successful adjustment, but the reform commitment might also increase with the external policy scrutiny. However, we still believe that this is the most appropriate sufficiently large sample available.

A second issue regards how to formulate a benchmark against which the success of an adjustment episode was assessed. Some earlier literature finds that benchmark by using the stated aims of IMF financial assistance programmes, such as providing short-run macroeconomic stabilization while supporting the economic policies conducive to putting it on a more sustainable path in the medium term. "Success" has then been defined as a resumption of economic growth, as well as sustainable levels of the fiscal deficit, debt, current account and unemployment (Ghosh *et al.*, 2002; Dreher, 2006; Steinwand and Stone, 2008).

Our first contribution is to construct an indicator of successful adjustment that improves on existing ones. Instead of using absolute thresholds for all countries regardless of their economic characteristics as IMF (2012) our definition is formulated relative to countries' pre-crisis levels of growth and debt, as they were sufficiently favourable for the country to finance itself on the capital markets. We believe that this approach is warranted given the highly varying country characteristics in our sample. This indicator however still applies a country-specific measure of success, *i.e.*, does not measure the extent to which adjustment in a certain country helped the adjustment of another. We will later provide an alternative specification we hope partly internalizes the spillover effects of adjustment.

In a second step, we try to identify factors that predict successful adjustment according to the indicator by means of regression analysis with a larger sample and a more thorough delineation of factors that could be affected by certain policies – the hard work – *vis-à-vis* those outside the countries' control such as global growth or risk appetite – help from abroad. Our set of possible factors conducive to successful economic adjustment draws on previous literature, regardless of whether the adjustment took place under the aegis of an IMF-supported programme or not. Barrios and Langedijk (2010) find that large current account deficits can significantly impair the ability of countries to achieve successful fiscal consolidations, but that absence of nominal exchange rate adjustment need not be a major impediment. The negative effects on growth and fiscal sustainability from banking crises, especially if they are preceded by a credit boom and followed by a credit crunch, were already studied by Calvo *et al.* (2006) and Cerra and Saxena (2008) but naturally came to the forefront during the current crisis given its origins in the U.S. financial sector (IMF, 2009; Laeven and Valencia, 2012; and Abiad *et al.*, 2011).

Our empirical strategy of regressing economic and policy variables on a binomial indicator of successful macroeconomic adjustment relies on an approach that is well-established in the economic literature. In particular, there is a link with the relatively rich literature on successful fiscal consolidation which developed since the mid-1990s (see, for instance, Alesina and Perotti, 1995; Alesina and Ardagna, 1998; von Hagen *et al.*, 1998; von Hagen *et al.*, 2001; von Hagen and Strauch, 2001; Guichard *et al.*, 2007; Larch and Turrini, 2011).

Our sample covers 176 IMF-supported programmes incepted during the years 1993-2010. Some euro area financial assistance programmes are still ongoing and drawing conclusions about their success would entail relying excessively on projections, which might be subject to bias. They are therefore not included in our sample, but we will discuss their future challenges by assessing their probability of success using the estimated coefficients from our regression and the variables forecasts for the coming years.

Our main findings are that among variables that can be affected by policy choices, faster fiscal adjustment, lower initial deficit and debt levels contribute significantly and positively to a successful adjustment episode. Decisive financial sector repair is also highly conducive to successful adjustment as lack of credit to the private sector significantly lowers the chances of success, while a systemic banking crisis per se need not be detrimental. The role of exchange rate flexibility is less clear cut, possibly due to different off-setting effects. The probability of successful adjustment is considerably higher if the global growth situation is favourable and risk appetite strong. Finally, while our primary aim is not to discuss the optimal design of IMF programmes, our results suggest that more official financing (which, conversely, is typically coupled with a more gradual fiscal adjustment) does not significantly contribute to success, while more stringent conditionality and especially in the structural area does appear to exert a significantly positive effect. Our findings turn out to be robust across a wide range of specifications and for controlled variations in the sample.

The rest of this paper is organized as follows. Section 2 presents stylized macroeconomic facts for the countries in our sample, and discusses how to construct an indicator of successful adjustment. Section 3 presents results from regression analysis of factors that increase the probability of successful adjustments, including alternative definitions thereof. It also discusses implications for the ongoing or recently completed programmes in Europe. Section 4 concludes by putting our main results in the context of policy recommendations and suggestions for future research.

## 2 Features of adjustment spells and measures of their success

### 2.1 Macroeconomic situation in countries receiving financial assistance

In this section we conduct a descriptive analysis of the sample and provide an overview of trends in key macroeconomic variables prior to, during and following economic adjustment programmes. The sample covers 176 completed or expired IMF General Resource Account (GRA) supported programmes extended to a total of 59 countries from 1993 and onwards.<sup>2</sup>

Among the 176 programmes in the sample 83 per cent were Stand-by-Agreements (SBA) and the remaining ones Extended Funding Facilities (EFF). On average a country had three programmes with the IMF, however there are countries which completed up to seven GRA-supported programmes. The average duration of an SBA amounted to 1.7 years with a maximum duration of 3 years, while EFFs were longer on average with a mean of 2.9 years and a maximum of 4 years. The average size of a GRA-supported programme reached 234 per cent of the country's quota with a standard deviation of 443 per cent. Countries which were considered to meet the IMF's Exceptional Access Criteria<sup>3</sup> in some cases reached above 3000 per cent of the country quota. Nearly 30 percent of programmes did not disburse any of the available official financing as countries could meet their financing needs through other sources. Countries drew on average 48 per cent of the funds approved under the programme, with the figure rising to 68 per cent when non-disbursing programmes are excluded.

A key decision for our analysis is to identify the horizon over which adjustment is assessed. In order to assess trends in key macroeconomic variables over the relevant horizon we define pre-programme, programme, and post-programme periods annually.<sup>4</sup> The year of programme start is denoted with T, the pre-programme period includes years T-2 and T-1, the programme period comprises the interval [T,T+2] and the post-programme period refers to T+3 and T+4. The appropriateness of the definition of the pre-programme and the programme period could be questioned as programmes can start at any time in the year. We will later try to control for this in our econometric analysis by varying the starting point depending on the date of programme inception. Moreover, policy measures tend to impact key macroeconomic aggregates with different lags. Decisively implemented measures aimed at improving the overall fiscal balance translate rather rapidly into fiscal headline figures, while structural reforms might impact real GDP growth with a delay of several years. Improvements in unemployment figures typically come only late in the recovery phase. Furthermore, using unemployment figures as an indicator for a revival of the labour market comes with disadvantages as a shrinking labour force (e.g., due to workers dropping out of the formal labour market) and falling employment might have offsetting effects on unemployment. However, unemployment remains the only labour market indicator available for a sufficiently large sample.

Another difficulty results from the fact that programmes tend to have different durations, depending, e.g., on the perceived time required for the needed adjustment. Average programme duration within the sample is approximately 1.9 years with a standard deviation of 0.9 years. Therefore, from this perspective the definition of the programme period as the time elapsed

<sup>2</sup> A complete list of programmes included in the sample is provided in Appendix C. There were more than 200 GRA-supported programmes put in place since 1993; our data sample shrank somewhat due to unavailability of data for some variables of interest for certain countries. The selection of GRA-supported programmes means that low-income-economies with no access to international financial markets were excluded from the sample. Programmes that started in 2011 or afterwards are excluded as we would have to partly rely on projected variables which could bias the results. Programmes not completed until end-August 2013 were excluded on corresponding grounds.

<sup>3</sup> [https://www.imf.org/external/pubs/ft/sd/index.asp?decision=14064-\(08/18\)](https://www.imf.org/external/pubs/ft/sd/index.asp?decision=14064-(08/18))

<sup>4</sup> We are following the same approach as in IMF (2012).

between T and T+2 seems appropriate, while bearing in mind that plenty of programmes were shorter than two years. Some programmes were immediately followed by a successor agreement as further adjustment was needed, and the improvement achieved in the post-programme period might not be directly attributable to the original programme. A further issue arises when defining the end of an adjustment programme as programmes can also end at any time in the year.

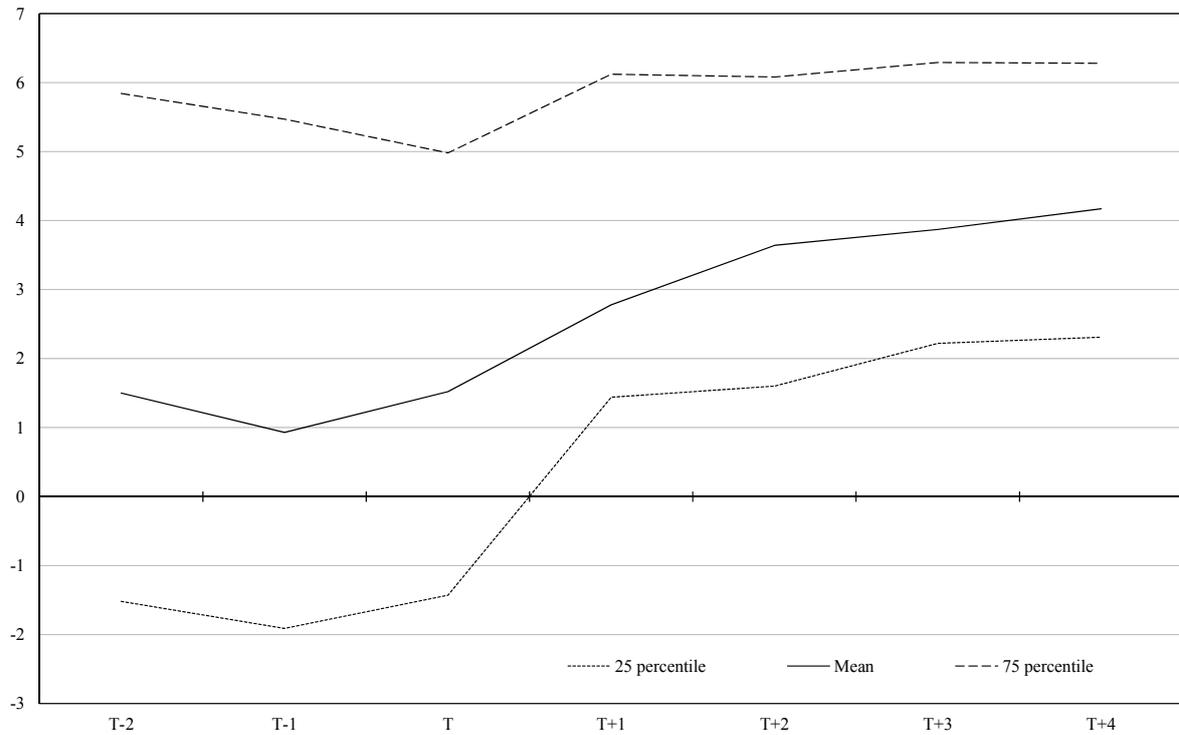
Bearing in mind the above caveats, on average key macroeconomic indicators improve during an IMF supported economic adjustment programme (Figure 1). Countries seeking financial assistance recorded a slowdown of real GDP growth in the pre-programme period, though average growth was still positive. A significant part of the countries suffered a recession as shown by the 25 percentile trend line. Fiscal indicators exhibit a similar pattern: both overall fiscal balance and primary balance deteriorated pre-programme and general government debt increased. The current account recorded substantial deficits during the run-up to the programme but already improved just prior to the programme which could be attributable to the fact that capital often flows out from countries suffering from macroeconomic disturbances. The interpretation of current account developments is, however, not straightforward. In many countries, a high current account deficit prior to the adjustment episode might be one of the vulnerabilities – particularly if it is financed by a large share of short-term portfolio flows – prompting it to seek financial assistance when financing dries up, and a reduction of it then suggests a more sustainable position going forward. However, in a fast-growing and capital-poor country standard economic theory recommends running a current account deficit to finance investment needs, and a widening current account deficit might then mean that external funds to finance such projects is again forthcoming post-crisis. Inflation was typically high before programme start, but also influenced by outliers. Therefore, when assessing trends in inflation, it is more appropriate to take the 25 and 75 percentile lines as reference values. Real consumption growth was on a deteriorating path in the pre-programme period. Unemployment was constantly growing prior to programme start and real domestic credit growth - measured as the percentage growth in real credit advanced to the private sector - was rather sluggish and on a declining path. The currency typically underwent a marked depreciation against the US dollar during the first year of a programme. Competitiveness – measured as a depreciation of the real exchange rate – typically worsened before a programme and held steady thereafter.

In the year of the programme start, real GDP growth slightly improved with economic growth returning gradually in the years afterwards. Countries that suffered from a deep recession in the pre-programme period experienced an even stronger rebound as suggested by the 25 percentile line. Overall fiscal and primary balances also improved significantly in the start year and the adjustment continued under the programme, while general government debt entered a declining path. When the general government debt to GDP ratio ranged above 50 per cent at programme start the average decline was more significant.<sup>5</sup> The trend in the current account shows a rather mixed picture, while inflation returned to modest levels and was clearly on a declining path. Unemployment kept growing until T+1, in line with expectations of labour markets reacting with a lag to a rebound of the economy, but did not decline significantly later on and hence stabilized at a slightly higher level compared to pre-programme levels. Inflation moderated after the programme was put in place, furthermore real consumption growth accelerated and returned to a higher path compared with pre-programme. Real credit growth rebounded during the programme period and remained at a significantly higher level than prior to programme start. Both the real effective exchange rate and the nominal exchange rate versus the US dollar and currencies of the given countries' trading partners stabilized gradually under the programme.

<sup>5</sup> In approximately 40 per cent of the sample the General Government Debt to GDP ratio ranged above 50 per cent at programme start and declined on average from above 85 per cent to below 75 per cent between T and T+4.

Figure 1

**Macroeconomic Situation in Countries under Economic Adjustment Programmes**  
**Real GDP Growth**  
*(percent)*



**General Government Debt to GDP**

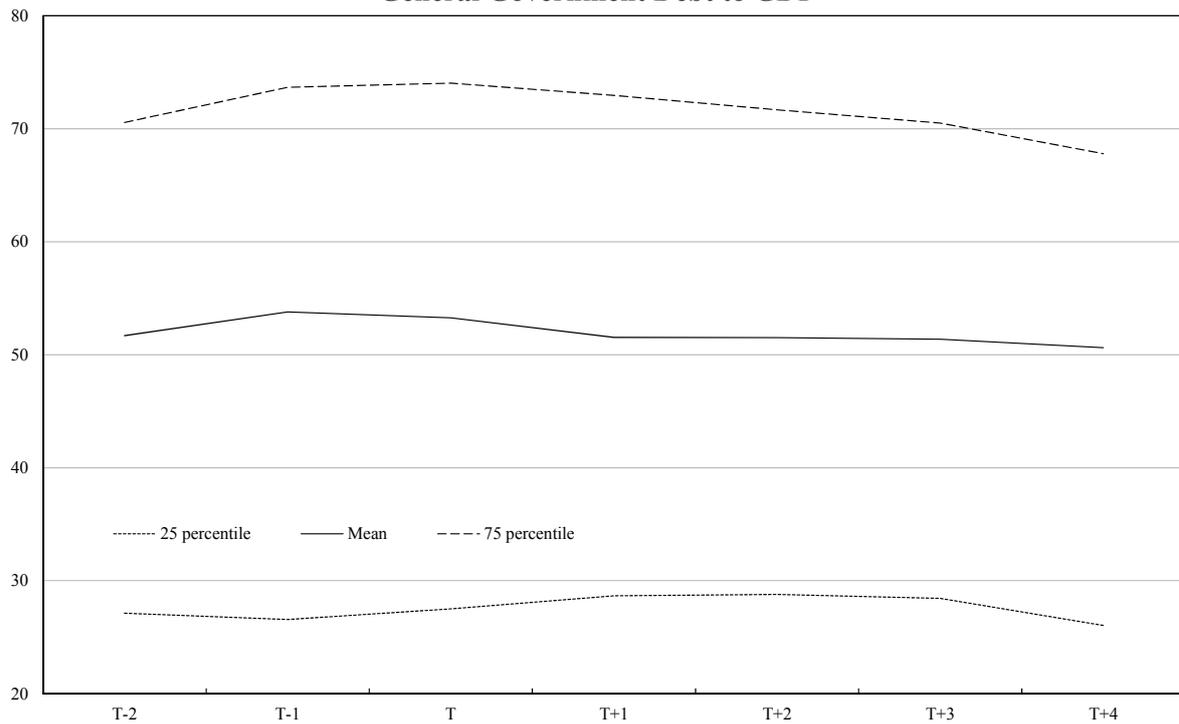
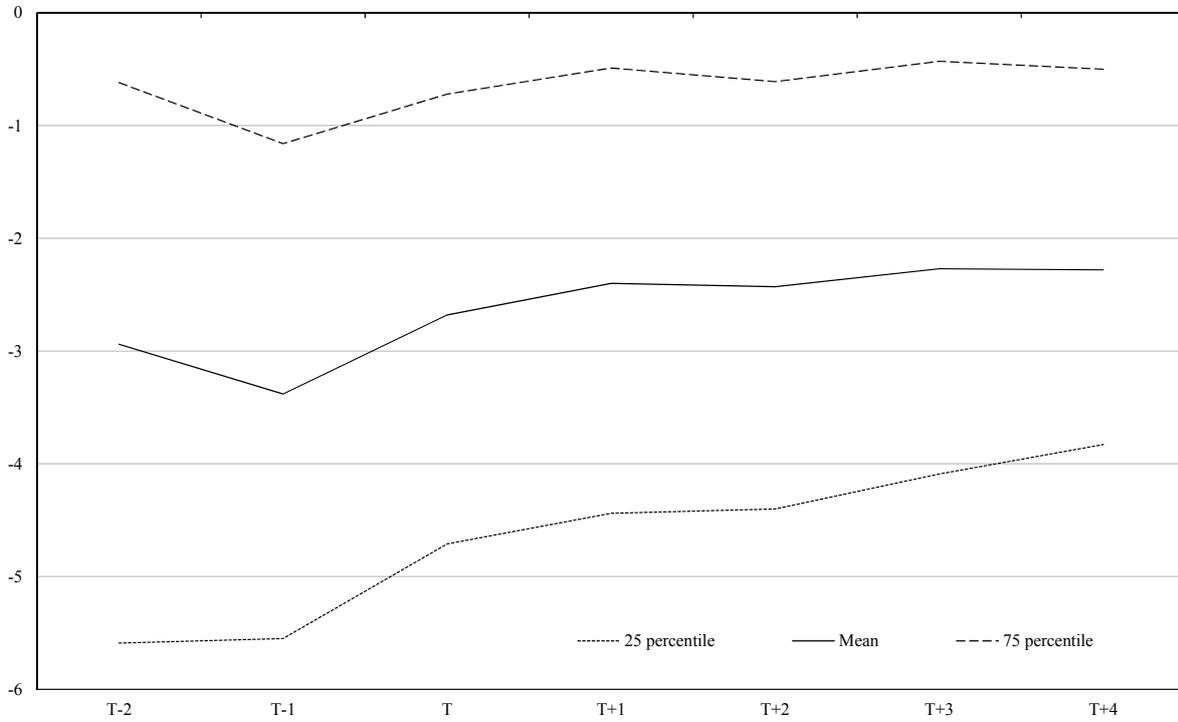


Figure 1 (continued)

**Macroeconomic Situation in Countries under Economic Adjustment Programmes**



**Primary Balance**

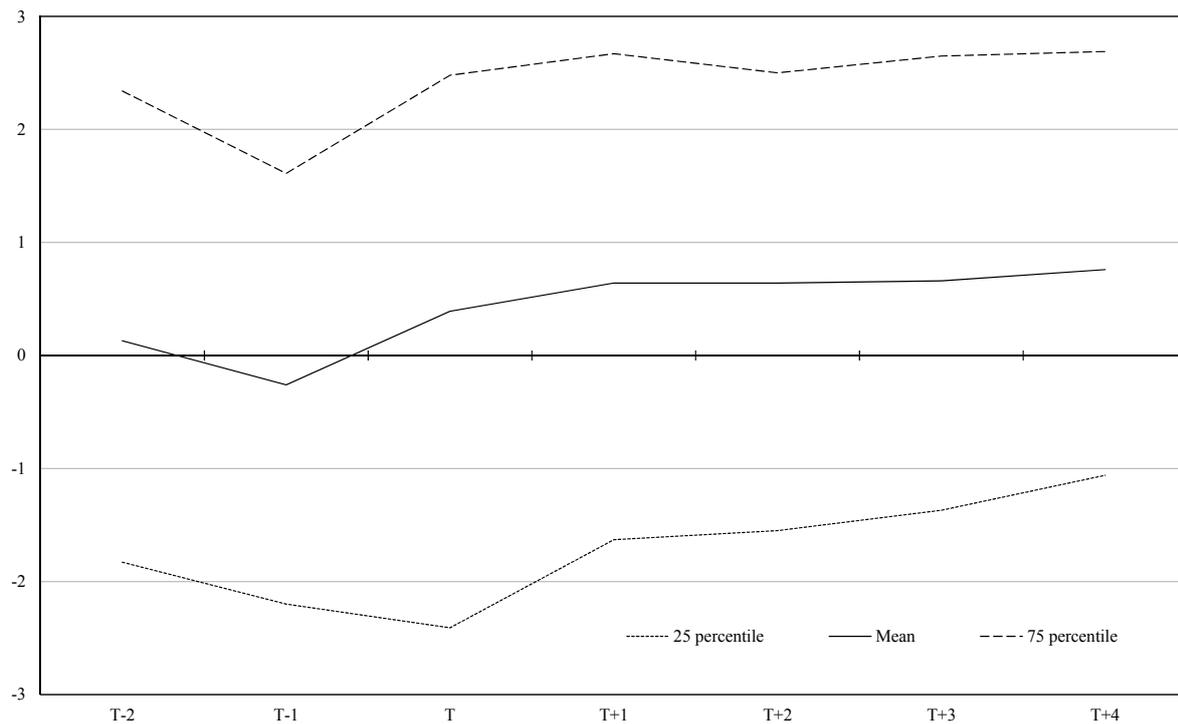
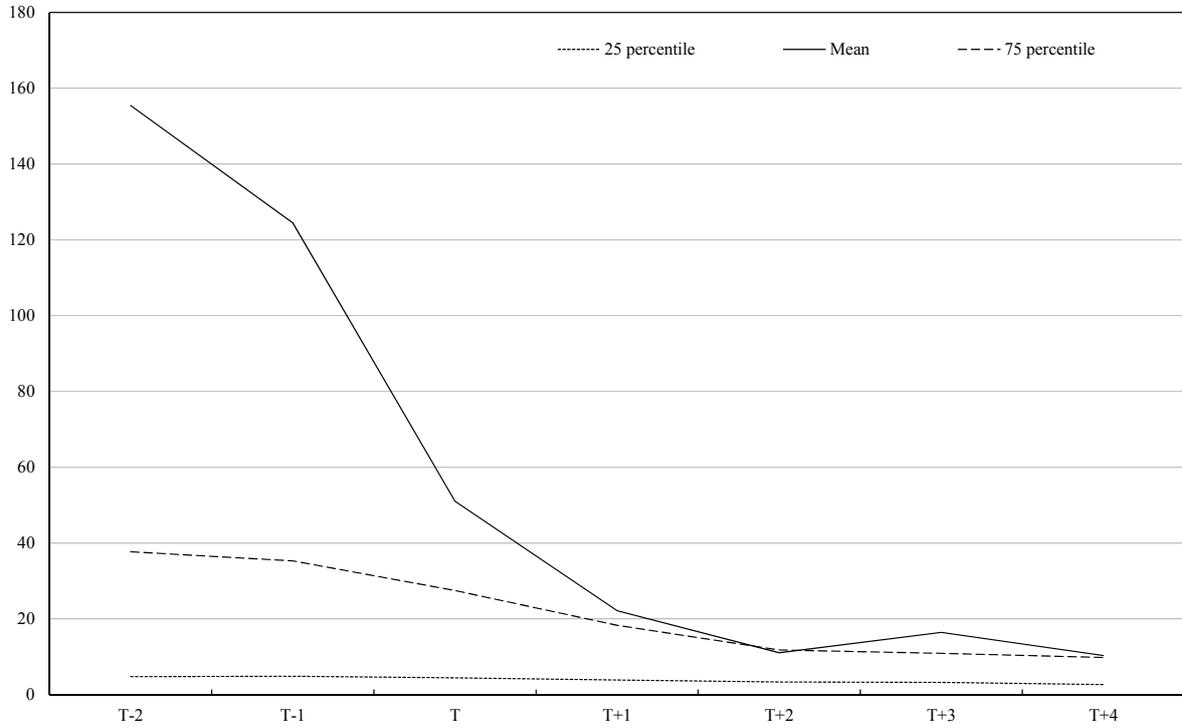


Figure 1 (continued)

**Macroeconomic Situation in Countries under Economic Adjustment Programmes  
Consumer Price Index Percent Change**



**Consumption Growth**

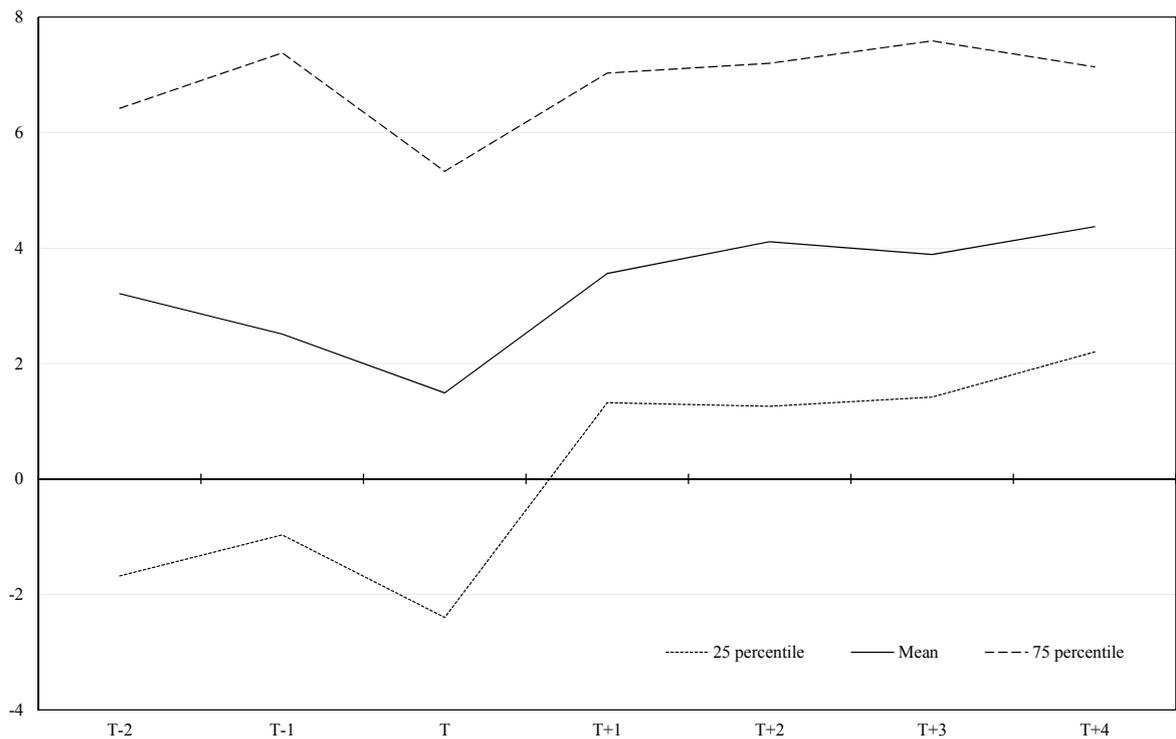
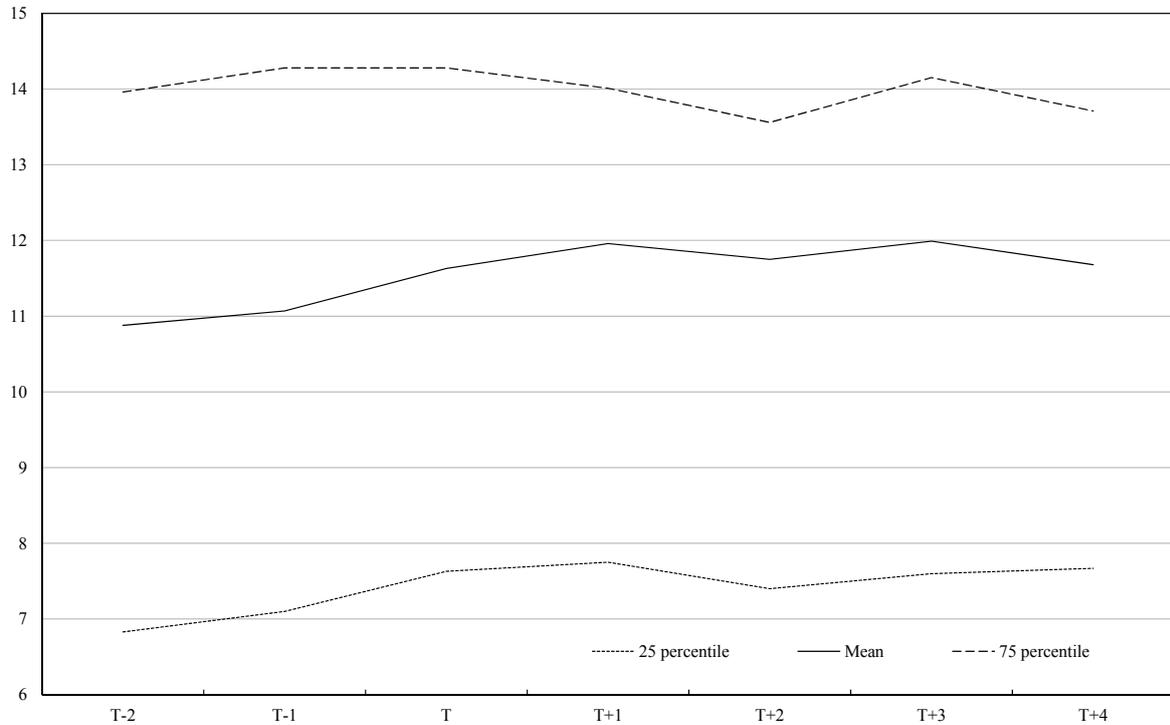


Figure 1 (continued)

**Macroeconomic Situation in Countries under Economic Adjustment Programmes**  
**Unemployment**



**Real Credit Growth**

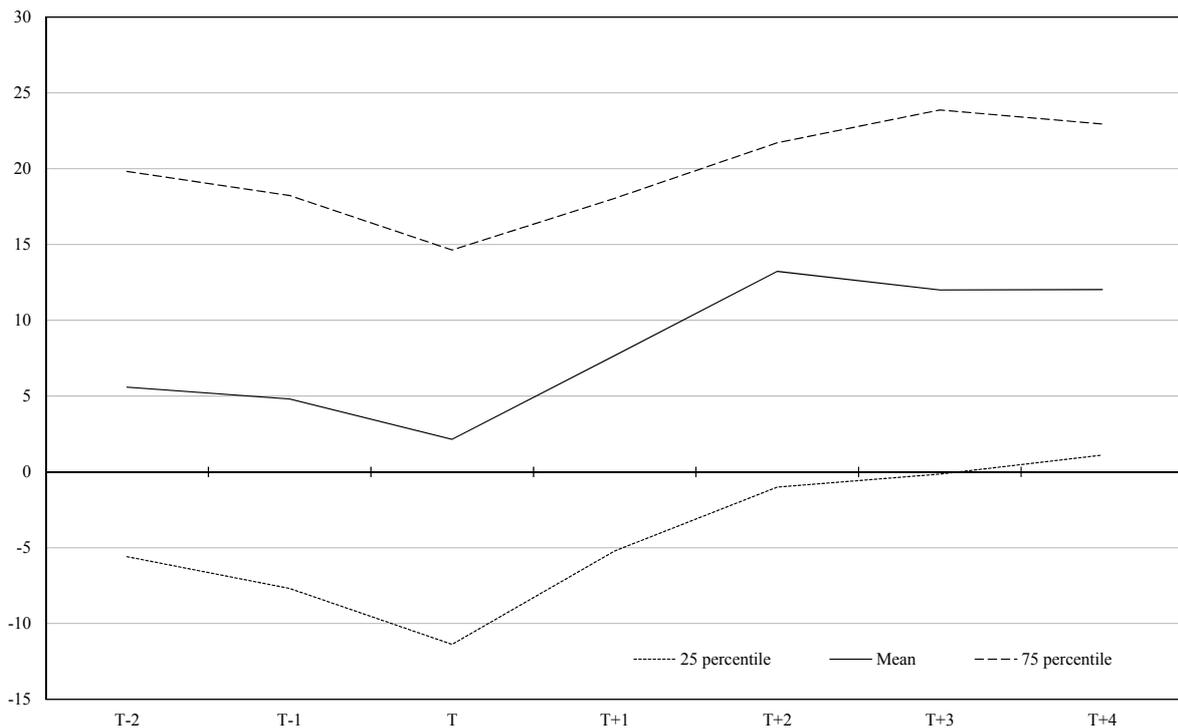
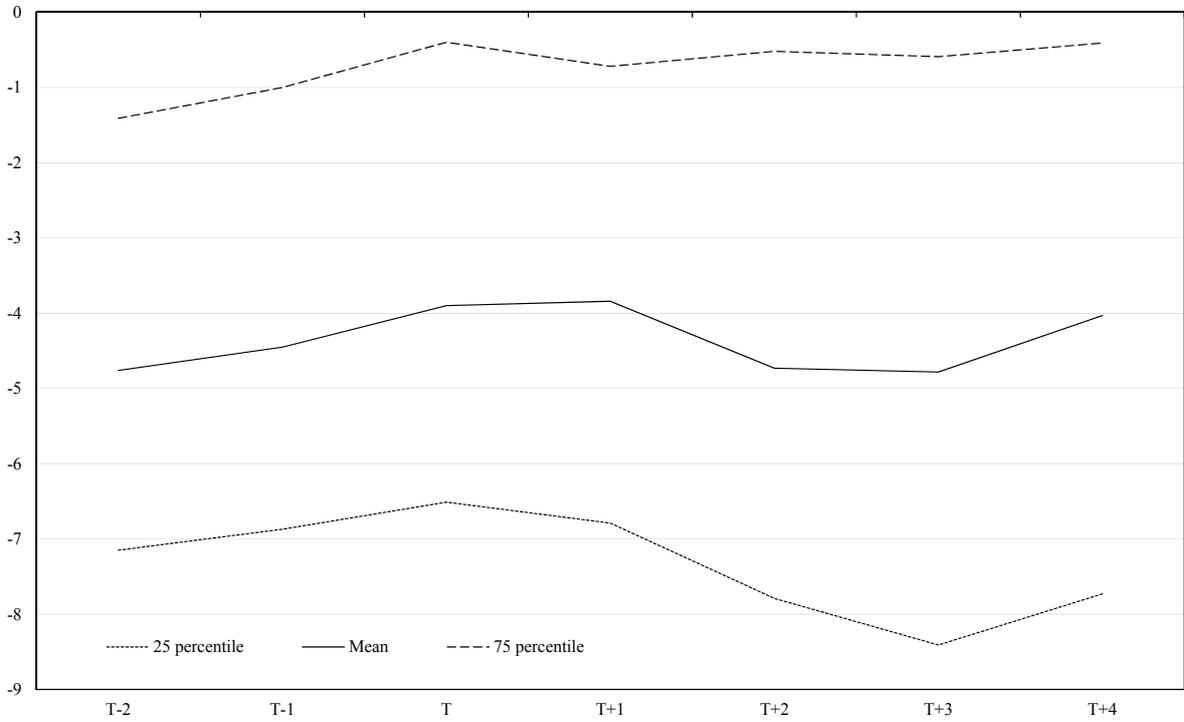


Figure 1 (continued)

**Macroeconomic Situation in Countries under Economic Adjustment Programmes  
Current Account Balance**



**Nominal Exchange Rate vs USD**

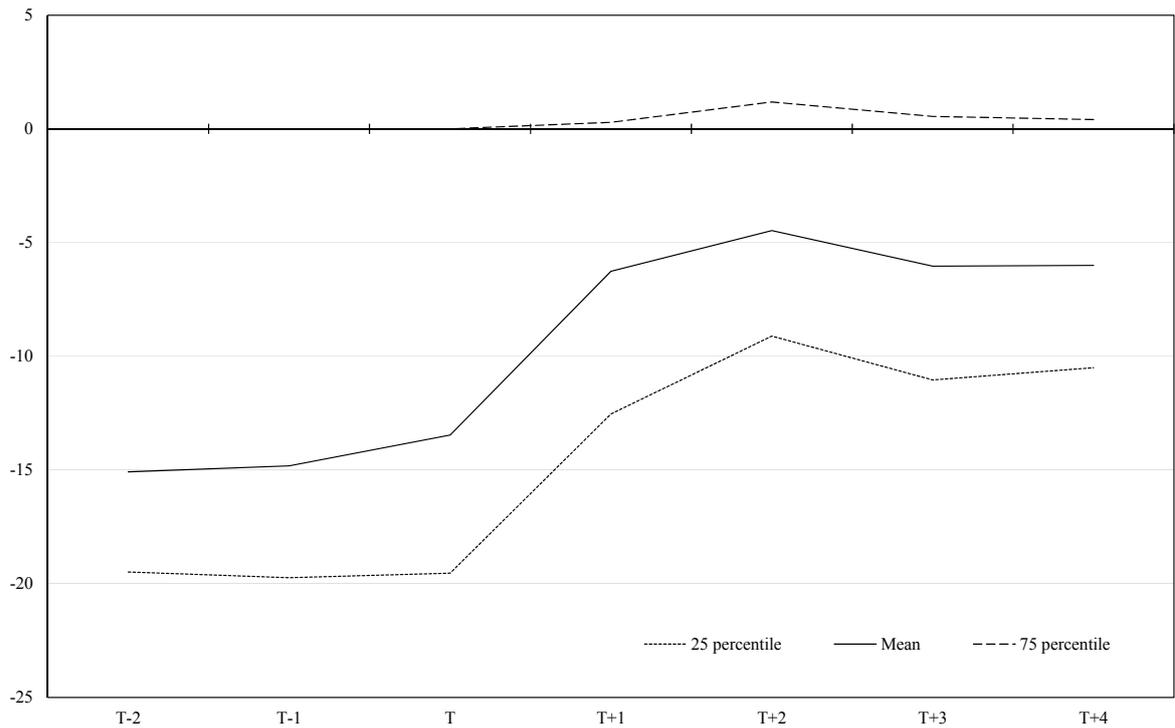
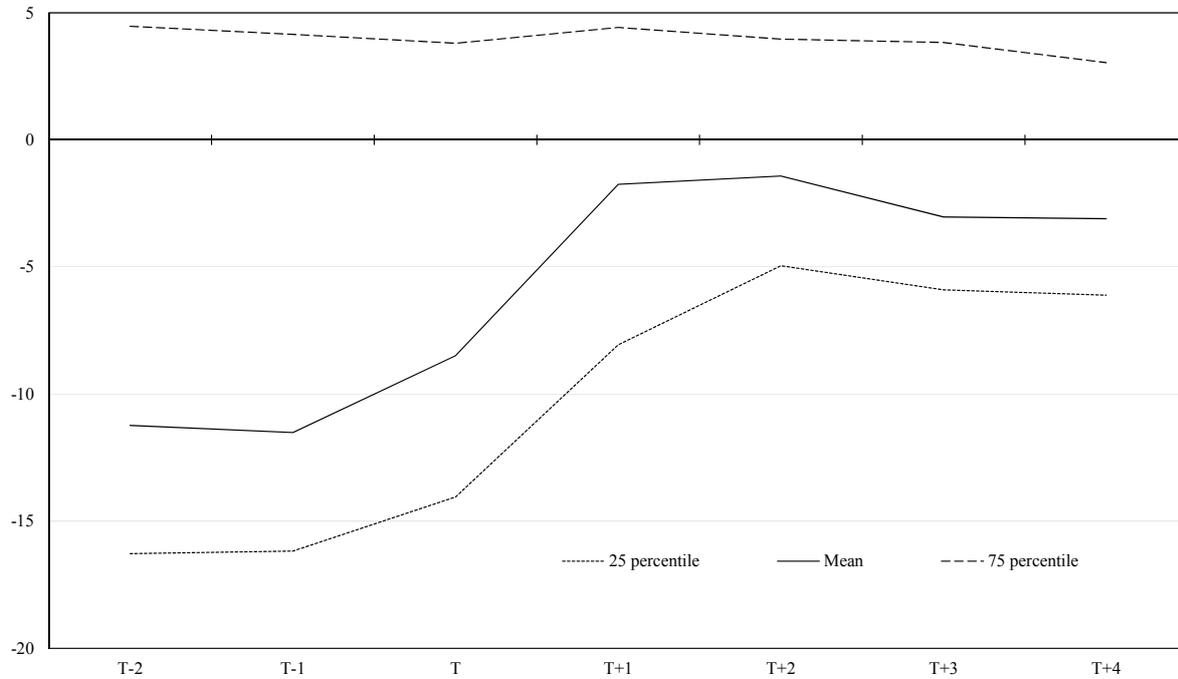
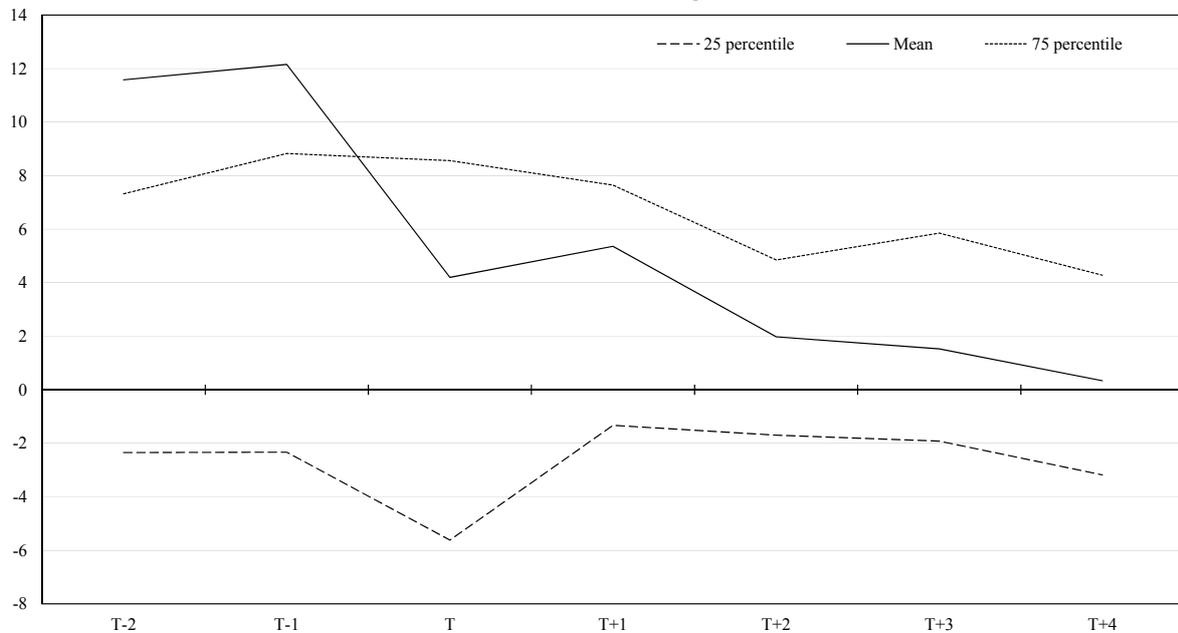


Figure 1 (continued)

**Macroeconomic Situation in Countries under Economic Adjustment Programmes**  
**Nominal Effective Exchange Rate**



**Real Effective Exchange Rate**



Source: IMF World Economic Outlook Database, IMF reports, IMF International Financial Statistics, Darvas (2012), World Bank and other sources. For a detailed description of the data sources see Appendix A; authors' calculations. Real credit growth, real effective exchange rate and nominal exchange rate vs. the USD are year-on-year percentage changes. The real effective exchange rate, the nominal exchange rate vs the USD and the nominal effective exchange rate are measured as the foreign currency price of one unit of domestic currency (indirect quotation). The mean of the change in the consumer price index is influenced by countries suffering from hyperinflation of above 1000 per cent per year.

Overall, on average key macroeconomic indicators appear to improve measurably during the programme period and continue to evolve favourably after its end. Real GDP growth accelerated, the general government debt to GDP ratio declined, both the overall fiscal and primary balance improved, real consumption growth rebounded and the currency stabilized.

## 2.2 How to measure successful adjustment

This section sets the basis for our econometric analysis aimed at identifying factors which influence the outcome of an adjustment programme. Prior to a more formal regression analysis we need a benchmark against which to evaluate success in order to identify factors enhancing the probability of successful exit from a macroeconomic adjustment programme, that is, we need to construct the dependent variable.

There are at least three conceivable ways of defining success: i) an “accounting” definition according to which a programme is considered a success if compliance with the policy conditions agreed under the programme is high; ii) a “market-based” definition that looks at whether market access is regained during or at the end of the programme; and iii) a more “macroeconomic” definition which is centred on the economic performance of the country during the years following the completion of the programme. Ideally, the three definitions should be complementary in the sense that success should manifest itself via a consistent compliance with policy conditions, combined with a return to market financing and a favourable macroeconomic performance after the end of the programme. In practice, however, things are likely to be more complex. Specifically, not all policy conditions may be equally relevant and market confidence has shown to be volatile and not always forward-looking. For these reasons, we concentrate on the sustainability dimension and gauge the success of an economic adjustment programme as a resumption of economic activity and improvements in the general government debt position.

In particular, we compare the average real GDP growth in five years after programme start with average growth in the five years prior to programme start to judge whether real GDP growth returned to the country’s own benchmark level following the start of the adjustment programme. In addition, we investigate whether general government debt entered a declining path within five years following programme start. This differs from IMF (2012) and Barrios and Langedijk (2010) which both use absolute thresholds regardless of a country’s own growth performance and ability to finance a certain debt level from market sources prior to the crisis. We believe this approach is warranted given that what could be considered a favourable growth and debt performance differ markedly within our sample due to the large variation in country characteristics, as well as differing market perceptions over time. Hence, those programmes are deemed to be successful which recorded *both* favourable economic growth and declining public debt according to the following criteria:

- I Post-adjustment real GDP growth rate to reach 3/4 of pre-crisis one
  - If average real GDP growth in  $[T-5, T-1]$  was  $\leq 3$  per cent then growth has to be above 2.25 per cent to succeed.
  - If average growth in  $[T-5, T-1]$  was between 3 per cent and 6 per cent then the average growth in  $[T+1, T+5]$  has to reach at least 3/4 of the growth in  $[T-5, T-1]$ .
  - If average growth in  $[T-5, T-1]$  was higher than 6 per cent, then above 4.5 per cent average growth in  $[T+1, T+5]$  is necessary to succeed.
- II General Government Debt to GDP ratio to decline by 5 per cent
  - If average general government debt to GDP in  $[T+1, T+5]$  was below 25 per cent, then the trends in public debt are considered to be irrelevant from outcome perspective.

- If average general government debt to GDP in  $[T+1, T+5]$  was above 25 per cent, then if general government debt peaked between  $T$  and  $T+5$  and declined by at least 5 per cent compared to the peak value, then the programme is deemed to be successful as regards the evolution of general government debt.
- The country does not default on its debt in  $[T+1, T+3]$ .

### 2.2.1 Growth criterion

Our rationale for choosing simple five-year averages for real GDP growth as opposed to, e.g., measures of potential output is mainly to increase robustness. Lack of sufficient data for many countries precludes the use of, e.g., a production function methodology for calculation of potential growth. A more readily available approach such as the Hodrick-Prescott (HP) filter on the other hand suffers from the well-known end point problem (Mise *et al.*, 2005).<sup>6</sup> Another valid criticism is that for measuring the performance of an economy over the long-term, five years might be short at first sight. Here again we are trying to strike a balance between the availability of GDP data on the one hand, and, on the other hand, that policy measures implemented in the post-programme period or afterwards could affect economic growth.

Our decision to use a three-pronged definition of success, is motivated by both technical and economic concerns. Several countries in our sample were suffering from negative average real GDP growth prior to the programme; and even for countries suffering from low, but still positive average growth, maintaining it cannot be considered meeting the key objective of putting the economy on a dynamic and sustainable growth path. Consequently, for the low-growth cases (below 3 per cent average growth before programmes start) at least an average growth of 2.25 per cent in  $[T+1, T+5]$  (3/4 of 3 per cent) is required to succeed. A similar sustainability argument can be made for choosing an absolute cut-off point for countries recording high growth before programme start, *i.e.*, above 6 per cent. The pre-crisis growth rates for these countries might simply have been symptoms of overheating, and as such it should not be considered a failure if they are not reached after the programme. Therefore, for the high-growth cases the adjustment episode is deemed to be successful, if average real GDP growth reaches above 4.5 per cent in  $[T+1, T+5]$ , which is again 3/4 of 6 per cent.<sup>7</sup> A graphic illustration of the growth criterion is provided in Figure 2.

On the basis of our criterion for real GDP growth nearly 65 per cent of adjustment episodes in our sample can be classified as successes. When we lower the bar so that only 2/3 of the average growth prior to the programme is required to be reached after programme start, the success rate increases only marginally to 68 per cent. We therefore consider our definition to be fairly robust with respect to the cut-off points. To address outstanding concerns regarding the effect of borderline cases, we will later rerun the regressions using the modified criterion for growth to see whether results from the regression still hold. We also calculated the number of programmes successful in restoring growth when modifying the required percentage of average real GDP growth in  $[T-5, T-1]$  necessary to be reached in  $[T+1, T+5]$  from 0 to 100 per cent in 10 per cent

<sup>6</sup> In addition, several successor states of the former Soviet Union or of the former Socialist Federal Republic of Yugoslavia, did not even exist before the programme was agreed and for some countries the real GDP series is far too volatile.

<sup>7</sup> Moreover, a continuous measure would have clashed with the relatively large share of countries transitioning from planned to market economies during the 1990s, as they quite frequently experienced years of extremely high or low growth. Another minor problem, partly addressed already above, arises from the fact that for 13 programmes real GDP growth is available only for a slightly shorter period than five years before programme start. However, since all these countries suffered from negative average real GDP growth rates during the year, it seems plausible to allocate them to the lowest growth criterion bar. The sole exception is Bosnia and Herzegovina which recorded immense economic growth after the end of the civil war, therefore we will assume that average prior to the programme was above 6 per cent, leading to a growth criterion of 4.5 per cent on average after programme start.

Figure 2

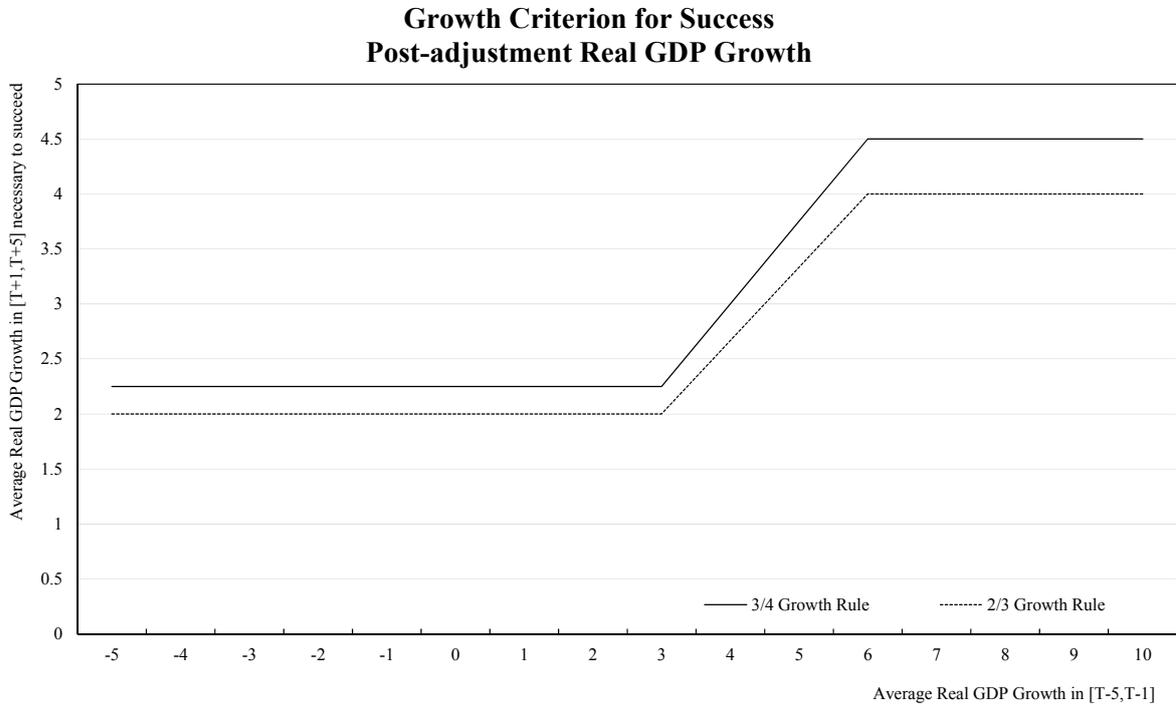
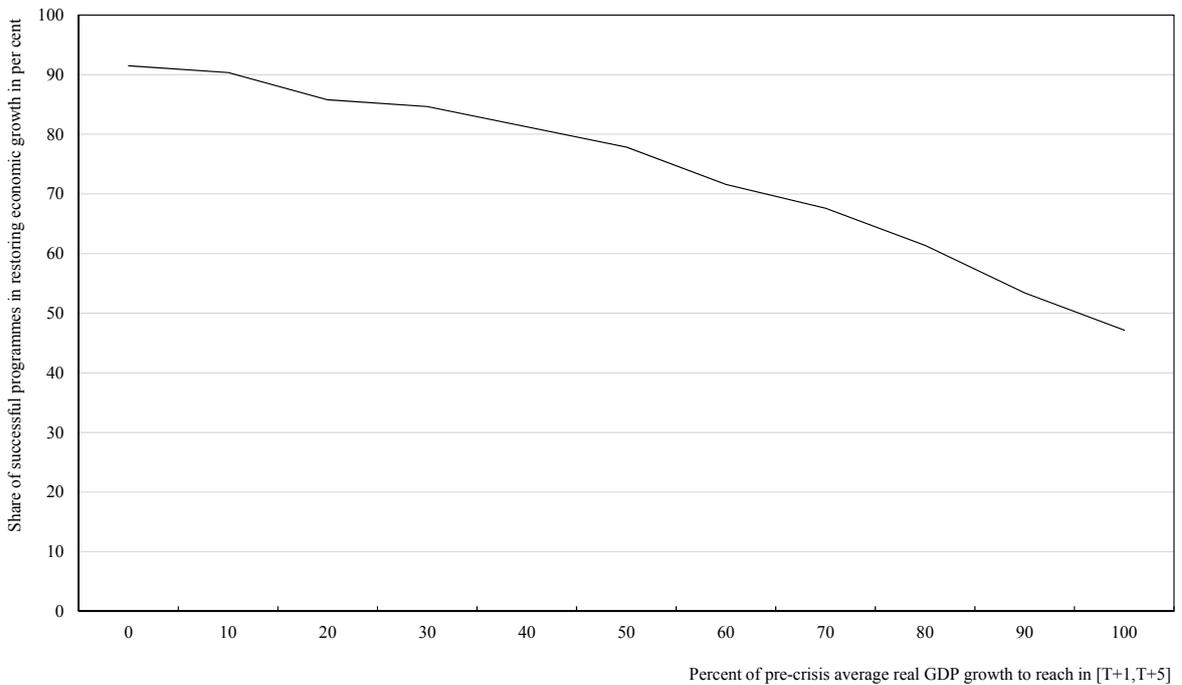


Figure 3

### Share of Successful Programmes in Restoring Growth Dependent on Percent of Average Pre-crisis Real GDP Growth to be Reached in [T+1, T+5]



Source: Authors' calculations.

steps (Figure 3). From the figure it is evident that the lower bound for the indicator would be achieving about 50 per cent of the pre-crisis average growth otherwise a far too high share of the adjustment episodes is judged as success. In addition, there is no sudden change in the slope of the line above.

### 2.2.2 Debt criterion

The aim of the debt criterion was to ensure a return to sustainable public finances, thus enabling continued market financing. We take a peaking of general government debt-to-GDP ratio and a reversal in the trend to be the key signal of sustainability. The literature and policy prescriptions for how much debt needs to be reduced to be considered sustainable are inconclusive (Reinhart and Rogoff, 2010; Herndon *et al.*, 2013; as well as, e.g., the Maastricht criterion for EU countries). We take an agnostic view and consider an attempt at restoring fiscal sustainability as successful if it lowers the general government debt-to-GDP ratio by at least five per cent in  $[T+1, T+5]$  compared with the peak value it reaches in  $[T, T+5]$ . Requiring a reduction of the debt-to-GDP ratio by an absolute five percentage points independently from the level of the debt-to-GDP ratio would privilege countries with high debt-to-GDP ratios “consolidating” through growing nominal GDP (denominator effect). A reduction in the level of general government debt instead affects the debt-to-GDP ratio in the same way independently from the level of the debt-to-GDP ratio.

A reduction in the level of general government debt can, however, also be achieved by a restructuring of the public debt, disorderly or planned. To make sure that only the latter are considered successes, a criterion with respect to disorderly default on outstanding debt had to be included in our definition. Accordingly, a default in  $[T+1, T+3]$  on debt would be considered a failure. The period  $[T+1, T+3]$  was chosen particularly with the aim to exclude those cases where a restructuring or debt release was part of the IMF-supported adjustment programme, which was also cross-checked with programme documents.<sup>8</sup>

This definition of the fiscal sustainability leads to a success rate of over 78 per cent, *i.e.*, substantially above the success rate found for the 3/4 economic growth criterion. Again, we checked for robustness of the debt criterion by shortening the time available for a reduction of the debt-to-GDP ratio to four years instead of five years and prolonged the period in which no default or debt restructuring may occur by one year. This modified criterion lowered the success rate by about three percentage points, and as such the criterion can be argued robust from this perspective. The debt criterion was also tested for robustness with respect to the per cent value by which the debt-to-GDP ratio is required to decline compared to the peak value. The figure below suggests that the debt criterion is fairly robust regarding the variation in the per cent threshold as there is again no sudden change in the slope of the curve.

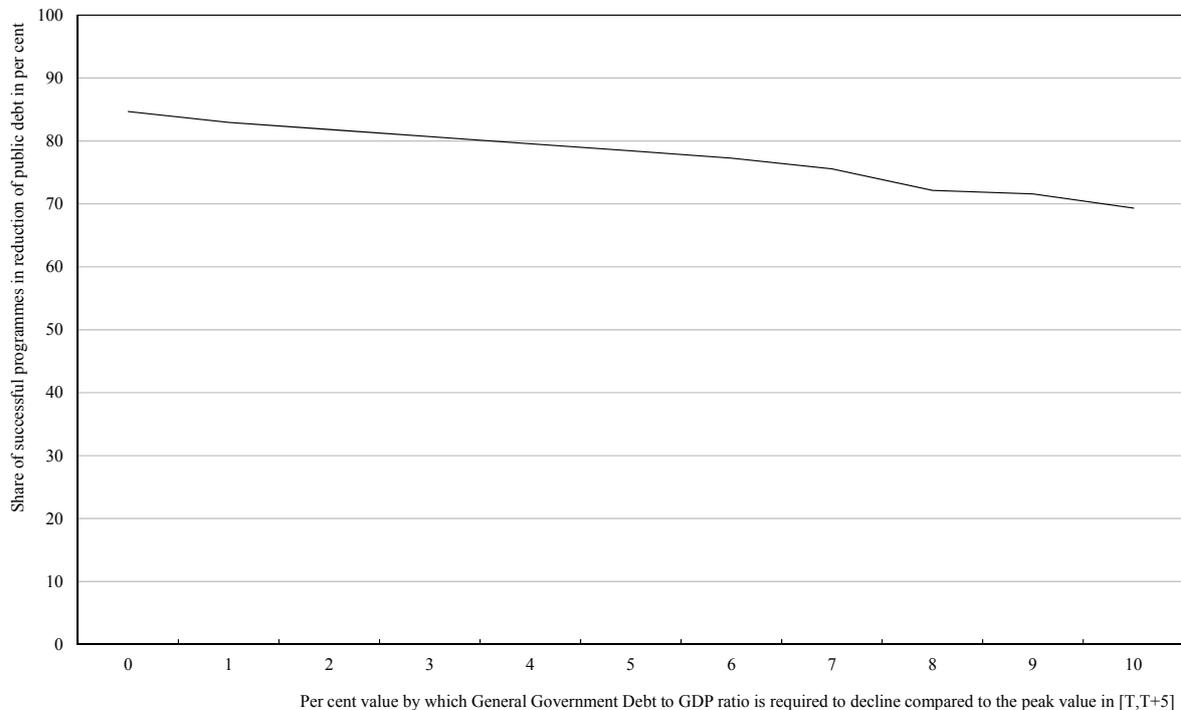
### 2.2.3 Results

Finally, taking the two criteria together, we find that 103 programmes are deemed to be successful which results in an overall success rate of 58.5 per cent. This shows that countries which succeeded according to the growth criterion typically succeeded in achieving debt reduction as

<sup>8</sup> In our sample there are 19 programmes where a default or a debt restructuring occurred during the period  $[T, T+3]$ . In seven of those cases debt restructurings were part of programme design. It is also worth noting that for all but a few of the remaining cases, the country also did not meet the growth criterion, and as a result only a handful of programmes were considered failures on the base of a default alone.

**Figure 4**

**Share of Successful Programmes in Debt Reduction Dependent on the Percent Value by Which the Debt-to-GDP Ratio is Required to Decline Compared with its Peak Value in [T,T+5]**

**Table 1**

**Success Rate of GRA-supported Adjustment Programmes**

	<b>General Government Debt to Decline by 5% until T+5 and No Default in [T+1,T+3]</b>	<b>General Government Debt to Decline by 5% until T+4 and No Default in [T+1,T+4]</b>
Post-adjustment real GDP growth rate to reach 3/4 of pre-crisis one	58.5%	58.0%
Post-adjustment real GDP growth rate to reach 2/3 of pre-crisis one	60.8%	60.2%

Source: Authors' calculations.

well. Table 1 provides an overview on the number of successes when using modified criteria. The table shows that modifications of our definition lead to very modest changes in the success ratio.

We also assessed the joint distribution with respect to both criteria, *i.e.*, the variation in the per cent of the pre-crisis average real GDP growth to be reached in  $[T+1, T+5]$  and the variation in the per cent value by which the debt-to-GDP ratio is required to decline compared with its peak value in  $[T, T+5]$ . A graphic illustration of the variation in both the growth and the debt criterion is provided in Appendix B Figure 6. The overall success rate ranges between 45 and 80 per cent.

### 3 Regression results

#### 3.1 Baseline specification

In this section we investigate factors associated with successful adjustment episodes as defined in the previous section. We first translate the success indicator using the growth and debt criterion into a binary variable, which is then used as the dependent variable in a probit regression. We assess the importance of a range of explanatory variables found to matter in previous literature. Broadly speaking, these can be divided into those that can be influenced directly or indirectly by policy action during the period of adjustment – the “hard work” part – and those outside the control of the country in question – the external conditions. The explanatory variables are summarized in Box 1.

We follow existing literature on panel data regressions and use a one-way error population-averaged (PA) estimator as our sample consists of a specific set of countries. Notice that our panel is not a “real” panel in the sense that each programme constitutes one observation and years in which no programme was put in place were excluded from the sample. A summary of the estimations is provided in Table 2.

Some of our explanatory variables could potentially be endogenous to an adjustment programme. For instance, a forceful implementation of a programme could generate confidence effects which then may spill over to the primary budget balance. At the same time, most of our explanatory variables are measured at the onset of the financial assistance programme (period  $T$ ) and should not be affected by subsequent events.

The first and most parsimonious specification includes only headline macro-fiscal variables (column 1 and 2 in Table 2). In line with previous literature, our hypothesis is that both the degree of initial fiscal vulnerabilities and the degree to which they are addressed matter for the success of the adjustment. In particular, we include both the fiscal balance in per cent of GDP at programme start and its improvement over the programme horizon. We find both to contribute to successful adjustment in a positive and highly significant manner, which is in line with what theory would suggest as well as with the results in the earlier literature on successful fiscal consolidation referred to above.

It is important to note that our results do not indicate whether the speed of adjustment was in any way optimal, in the sense of striking the right balance between its impact on economic activity and progress towards sustainable public finances. We refer here to the recent debate about the size of fiscal multipliers triggered by the contribution by Blanchard and Leigh (2013) according to which fiscal consolidation could be self-defeating in view of larger than expected fiscal multipliers. Based on their findings, Blanchard and Leigh have argued in favour of a less-now-and-more-later type of fiscal adjustment. Evidently, this does not clash with our finding about the role of fiscal consolidation for successful macroeconomic adjustment: Blanchard and Leigh focus on the short term, while our analysis looks at the medium term horizon when possible negative effects of fiscal consolidation are likely to be outweighed by positive effects. There is a growing body of empirical literature showing that fiscal consolidation triggers a medium-term adjustment process, typically via the labour market, which has a positive impact on a country’s competitiveness and, ultimately,

**BOX 1**  
**EXPLANATORY VARIABLES**

- **Fiscal Balance in T:** fiscal balance in the year of programme start measured as general government net lending in percent of GDP
- **Fiscal Balance adjustment:** the change in general government net lending in percent of GDP during programme, percentage points
- **Real GDP growth in T:** year-on-year percentage change
- **Primary Balance in T:** general government net lending in percent of GDP excluding interest expenditures
- **Primary Balance adjustment:** change in primary balance in percent of GDP during programme, percentage points
- **Public Debt in T:** general government debt to GDP at programme start
- **World GDP growth:** average year-on-year percentage change between T+1 and T+5
- **Banking crises:** dummy variable taking the value 1 if a banking crisis was ongoing in the year of programme start using the definition in Laeven and Valencia (2012)
- **Credit crunch:** dummy variable taking value 1 if real credit advanced to private sector recorded negative growth in at least two years between T and T+2
- **Exchange rate regime in T:** IMF classification taking values from 1 to 15; a higher value indicates a more flexible exchange rate regime.
- **Openness indicator:** measured as exports plus imports divided by GDP
- **VIX in T:** (Chicago Board of Exchange S&P 500 Implied Volatility Index) capturing the risk appetite of the market and taking high values in times of turbulence and crisis
- **Nominal Effective Exchange Rate, change:** adjustment in nominal effective exchange rate under a programme. An increase in the NEER is equivalent to an appreciation
- **Current Account Balance:** in per cent of GDP
- **Change in Current Account Balance:** percentage point change in the current account balance under a programme

Note: T denotes the year of a programme start. Data sources are listed in Appendix A.

its aggregate level of economic activity (see Alesina and Perotti, 1995, for an early contribution to this field, as well as were Hernández de Cos and Moral-Benito, 2014 and Lamo *et al.*, 2014 for recent and specific evidence of this labour market or competitiveness channel).

There is also a vivid discussion on the level at which, if at all, public debt impacts negatively on growth (Reinhart and Rogoff, 2010; Herndon *et al.*, 2013). In our framework, we both require a positive association with growth and material reduction of debt to consider the adjustment process a success, and can, therefore, only include the initial level of debt among our explanatory variables to avoid spurious correlations. We find only a small and not significant effect of the debt-to-GDP level at programme start in our parsimonious specification.

However, the definition of the fiscal adjustment also matters for properly disentangling the effects of debt and fiscal consolidation on the outcome. Hence, we also estimated the model using the primary balance at programme start and the adjustment carried out in the primary balance instead of the overall budget balance, as we believe that this measure which excludes interest expenditure provides a better measure of the de facto fiscal adjustment (column 3 and following in Table 2). In addition, countries agreeing to a GRA-supported programme typically cover some of their financial needs by drawing on the credit provided by the programme, which is usually extended at somewhat concessional terms and has a bearing on the interest bill which needs to be kept in mind when extrapolating the results to discuss adjustment episodes in general. The results of the estimation using the primary balance are presented in column 2. The significance of the budgetary variables is maintained while the negative impact of the debt-to-GDP level on success is higher, though still borderline insignificant.

Real GDP growth at programme start was positively associated with successful adjustment episodes, which simply and intuitively suggests that adjustment episodes where growth had already returned at programme inception had a higher probability of success.

The recent crisis has shed light on the role of the financial system during adjustment episodes, with emerging conclusions that banking crises typically are associated with slower and more protracted recoveries. Therefore, we would expect that a banking crisis affects the outcome of an adjustment episode in a negative way. However, and in contrast to existing research, in our regressions the corresponding dummy variable is estimated to exert a positive effect (column 4). A closer look at the banking crises identified by Laeven and Valencia (2012) however show that while the effects on GDP growth and public debt are typically negative, they vary widely. One hypothesis is that it is only in instances when a banking crisis leads to a protracted lack of credit that the recovery is hurt (Abiad *et al.*, 2011; Calvo *et al.*, 2006). We therefore included a credit crunch dummy taking on the value one if real credit growth is flat or negative for two years during the period  $[T, T+2]$ . The results in column 5 show that a credit crunch has a significantly negative influence on the outcome which is in line with a priori expectations. This again suggests that hard work, *i.e.*, sufficient repair of the financial sector after banking crisis, pays off in terms of a higher likelihood of a successful adjustment. When measures of financial sector health are included, the impact of the initial debt-to-GDP ratio also becomes significant.

Turning to external variables, we find that external demand (average real world GDP growth for the period  $[T+1, T+5]$ ) had a strong positive association with success (column 3). This is in line with expectations as increasing demand for export goods is certainly supportive for economic growth and may also help cushion negative effects of a decline in domestic demand on the back of fiscal retrenchment. To underpin this hypothesis from an econometric perspective, openness was added to the model as well with results reflected in column 7. The positive coefficient suggests that the chance of a successful exit from an official adjustment programme increases with the degree of openness, again as expected.

A more flexible exchange rate regime is typically found to be helpful for economic adjustment through its favourable price effects on export goods, which is also confirmed by our model in column 6. However, currency flexibility, or more specifically depreciation, may also have unfavourable effects. A high degree of pass-through to import prices may partly offset the gain resulting from relatively cheaper export goods for the rest of the world.<sup>9</sup> Depreciation of the home

<sup>9</sup> The extent of the gain in competitiveness as a result of currency devaluation depends largely on the share of import goods necessary for the production of export goods and the added value in the export sector.

Table 2

## Factors Conducive to Successful Adjustment; Results from Probit Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Fiscal Balance in T</b>	0.088 (0.038)**									
<b>Fiscal Balance adjustment</b>	0.099 (0.033)***									
<b>Public Debt in T</b>	-0.001 (0.003)	-0.004 (0.003)	-0.006 (0.004)	-0.007 (0.004)*	-0.007 (0.004)*	-0.006 (0.004)	-0.008 (0.004)*	-0.008 (0.004)**	-0.007 (0.003)**	-0.008 (0.003)**
<b>Real GDP Growth in T</b>	0.050 (0.018)***	0.056 (0.019)***	0.059 (0.022)***	0.073 (0.030)**	0.064 (0.032)**	0.081 (0.029)***	0.096 (0.026)***	0.093 (0.027)***	0.094 (0.031)***	0.092 (0.030)***
<b>Primary Balance in T</b>		0.077 (0.039)*	0.092 (0.040)**	0.093 (0.038)**	0.091 (0.033)***	0.099 (0.031)***	0.090 (0.029)***	0.082 (0.033)**	0.114 (0.038)***	0.118 (0.039)***
<b>Primary Balance adjustment</b>		0.087 (0.039)**	0.073 (0.037)**	0.075 (0.039)*	0.068 (0.038)*	0.077 (0.039)**	0.085 (0.040)**	0.090 (0.036)**	0.128 (0.040)***	0.121 (0.043)***
<b>World GDP Growth [T+1,T+5]</b>			1.388 (0.256)***	1.489 (0.285)***	1.573 (0.309)***	1.673 (0.309)***	1.907 (0.286)***	2.115 (0.287)***	2.171 (0.311)***	2.272 (0.349)***
<b>Banking Crisis</b>				0.783 (0.318)**	0.868 (0.333)***	0.816 (0.342)**	0.898 (0.305)***	1.042 (0.285)***	1.240 (0.384)***	1.254 (0.383)***
<b>Credit Crunch</b>					-0.497 (0.233)**	-0.531 (0.231)**	-0.536 (0.231)**	-0.497 (0.244)**	-0.530 (0.263)**	-0.548 (0.270)**
<b>Exchange Rate Regime</b>						0.067 (0.031)**	0.085 (0.031)***	0.064 (0.033)*	0.092 (0.032)***	0.088 (0.033)***
<b>Openness Indicator</b>							0.008 (0.003)**	0.009 (0.003)***	0.008 (0.004)**	0.007 (0.004)*
<b>VIX - S&amp;P 500 Volatility Index</b>								-0.057 (0.020)***	-0.044 (0.020)**	-0.049 (0.021)**
<b>NEER change</b>									0.022 (0.010)**	0.023 (0.010)**
<b>Current Account Balance</b>										-0.004 (0.015)
<b>Change in Current Account Balance</b>										0.022 (0.021)
<b>Constant</b>	0.423 (0.247)*	0.334 (0.254)	-4.643 (0.959)***	-5.144 (1.124)***	-5.260 (1.237)***	-6.149 (1.275)***	-7.756 (1.209)***	-7.275 (1.198)***	-7.910 (1.380)***	-8.068 (1.440)***
<b>N</b>	176	176	176	176	176	176	176	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. Source: Authors' calculations.

currency if debt is denominated in foreign currency leads to higher debt servicing costs.<sup>10</sup> We included the percentage change of the nominal effective exchange rate (NEER) to investigate the relative importance of these channels, and the results in column 9 show us that its effect is significantly positive, suggesting that an appreciation of the home currency is positively associated with successful adjustment. This could suggest that the negative effect of a currency depreciation on the debt servicing costs in the short-run outweighs the possible benefits which would arise from a gain in competitive advantage, but could also be a spurious correlation in the sense that both, e.g., the resumption of growth and the appreciation of the currency stem from enhanced confidence in the sovereign more generally.

International investors' risk appetite is also likely to matter for successful adjustment, as it could result in different perceptions of countries' creditworthiness over time regardless of their economic fundamentals. We proxy risk appetite with the VIX indicator as in previous literature. According to the results reported in column 8 a higher implied volatility – or conversely, lower risk tolerance – is significantly negatively associated with successful adjustment.

A large current account deficit is often seen as an important vulnerability that could be incompatible with successful adjustment, although the expected effects are not clear-cut as discussed earlier.<sup>11</sup> We included the initial position and the adjustment carried out in the current account under the programme to the regression, but did not obtain significant results. As the benefit arising from the inclusion of the current account balance into the model is rather limited, in the following we will disregard this variable and use the specification in column 9 as our baseline model.

### 3.2 Extensions

One factor of interest is whether the degree of imbalances experienced by a country affects the results. We proxy the degree of imbalances with whether the IMF-programme was disbursing or not, with the hypothesis that smaller adjustment needs meant that the country could continue to finance itself on the market and did not need to draw on official financing. We therefore added a dummy variable reflecting whether disbursements occurred under the programme.<sup>12</sup> Results suggest that this does not play a role as the coefficient is slightly negative and does not substantially differ from zero (for results, see Appendix D). The share of the funds drawn under the programme relative to the amount available and the size of the programme relative to the country's economy were also found to be insignificant.

We also investigated which types of economic reforms are most conducive to successful adjustment. To ensure a common definition, we identify these reforms by way of the conditionality agreed under the programme. Broadly speaking there exist two different subgroups of conditions, quantitative performance criteria (QPC) and structural conditions.<sup>13</sup> QPCs are quantifiable and measurable criteria while structural conditions are often non-quantifiable criteria and consist of

---

<sup>10</sup> A possible criticism is that foreign currency denominated debt was mostly issued in USD and the nominal effective exchange rate is the exchange rate *vis-à-vis* a basket in which the weight of the USD might be small. Yet, under no arbitrage assumptions a depreciation of the home currency *vis-à-vis* other currencies would result in a depreciation versus the USD as well if keeping the relative price of the currencies of the trading partners constant versus the USD. Therefore on average the NEER should also reflect exchange rate movements versus the USD.

<sup>11</sup> An improving current account balance also signals capital outflows, while an economic recovery in emerging markets usually goes along with capital inflows. Exchange rate effects on the interest bill might further obscure clear results.

<sup>12</sup> The number of non-disbursing adjustment programmes is 50.

<sup>13</sup> The IMF streamlined the number of quantitative performance criteria in 2002 leading to an overall reduction in the number of quantitative performance criteria. Therefore, the QPC series suffers from a structural break which may also result in lack of significance.

policy measures aimed at implementing structural reforms (e.g., to the labour or product markets) and in general correcting disruptions to the supply side of the economy. First, we assess whether the total amount of criteria per se matter for the chance of success. Results show that the probability of a successful exit is increasing with the overall number of criteria and conditions (see Appendix 3). We also included separately the total number of the QPCs and the total number of structural conditions into the model. We found that the impact of both the QPCs and the structural conditions is positive but only the coefficient of the structural conditions is significant. Five years might appear to be a rather short period of time for the assessment of the impact of structural reforms, but we tried to strike a balance between allowing a sufficient time frame for the full effects to be felt while not letting so much time pass that we in fact mainly picked up the effects of other factors. Finally, there are three different types of structural conditions, so called prior actions (formerly: conditions for completion of the review), structural performance criteria and structural benchmarks. We estimated the regression including the QPCs and three different types of structural conditions separately. Results show that only prior actions and structural performance criteria have a statistically significant positive impact on the outcome.

### 3.3 Robustness checks

We performed a number of sensitivity checks and found that our results hold up. First, we reran the baseline regression with the modified criteria for success outlined in Chapter 2. Using the modified criterion for public debt, *i.e.*, changing the relevant horizon for the reduction to occur, and maintaining the original criterion for economic growth did not substantially change the coefficients. If applying both the modified criterion for economic growth, *i.e.*, lowering the bar to 2/3 of average growth, and public debt reduction, we obtain again similar results. At last, when using the modified criterion for economic growth and the original criterion for public debt reduction we obtain the same results and all variables are significant, independently from the estimator used.

We also tested the baseline regression using only the 3/4 growth criterion as the dependent variable. The results mainly hold up with the exception that the impact of the adjustment in the nominal effective exchange rate variable is less than one third if compared with the baseline regression and also turns insignificant which again appears to support the hypothesis on the link between exchange rate flexibility and debt reduction posited earlier. We also used average five year real GDP growth rates after programme start, as opposed to the binary indicator, as the dependent variable and found that the results do not substantially differ from those in the baseline setting. Finally, as our panel regression is not a “real” panel the model was also estimated as a customary probit regression and results remain similar.

We also estimated the baseline model using the cyclically adjusted primary balance (see Appendix D) as well, to try to control for cyclical effects on fiscal adjustment. Cyclical effects were removed using the HP-filter, for which advantages and drawbacks were discussed in the previous part. The results are not substantially different compared with the baseline model.<sup>14</sup> While the composition of a fiscal adjustment, *i.e.*, whether revenue versus expenditure based adjustments, is an interesting and relevant question as well (Barrios and Langedijk, 2010), the necessary data is

<sup>14</sup> The sole divergence is that openness variable becomes insignificant, though there is no change in the sign or the order of magnitude. A further issue to be addressed is the link between the variables measuring the primary balance at programme start and the adjustment carried out during the programme horizon. It could be expected that the initial condition and change should sum up (primary balance and adjustment under programme) to the end condition and the interaction leads to wrong results. In the baseline model we see that the coefficient in the primary balance at programme start and in the adjustment carried out during programme horizon are nearly similar. We exchanged both variables related to the primary balance for the end condition which is the primary balance at programme end and we found that results remain similar.

unfortunately not available for a sufficiently large part of our sample. We re-classified the 15-notch variable of exchange rate flexibility into a binary one (fixed vs. non-fixed exchange rate regime) and found that a fixed exchange rate regime has a negative impact on success which is in line with findings from the baseline model.

We applied gradual cut-offs in terms of income levels to our sample and found that our results held up, although some variables became insignificant when the sample size shrunk by more than a third. Our results also held up to the exclusion of countries in early stages of post-communism transition and to the exclusion of a specific region as well (e.g., Asia, Latin-America and the Caribbean, non-EU Europe, Europe).

A number of financial programmes which lasted only for a rather short period and were succeeded by the next agreement in the following year are included in the sample, which makes it difficult to determine the length of the adjustment episode. When excluding those programmes which were followed by a successor agreement in the following year the openness and credit crunch variables became insignificant in specifications without country-fixed effects.

We also changed the reference year as a significant part of the adjustment in the primary balance was carried out in the year of the programme start. We estimated the baseline model using T-1 (the year before programme start) as the reference year for the initial condition with respect to the primary balance and the adjustment carried out, and found no significant difference in the coefficients compared with the baseline model, which again indicates that exiting the programme with a sound public finances positively contributes to programme success. We also redefined the reference year for the programme end contingent on in which month in the year the programme ended and found that results remain similar. Finally, the results were also robust to using the random effects (RE) estimator, since country fixed effects were not found significant. This could likely be due to the “incomplete” panel nature of our sample.

### 3.4 Comparison with market perceptions of success

A common view of a successful adjustment following a financial assistance programme is that the country can again fully finance itself from the markets, without the aegis of an IMF-supported programme. To compare this notion of success with our indicator requiring improvement in the growth and debt situation, we define market-based success as a country not requesting another IMF-programme within a certain time frame.<sup>15</sup> Another advantage of this definition is that market participants should take spillovers between different government securities into account when making their investment decisions, and therefore this measure of success ought to internalize the cross-country effects of adjustments in different countries to a greater extent than our growth-debt indicator.

We find that 36 per cent (32 per cent) of countries did not request a follow-on programme within a two (three) year horizon. This means that the success rate for a market-based indicator is about half of the one using the growth and debt situation, which could be taken as evidence that e.g., contagion concerns are fairly prevalent for market participants when assessing the creditworthiness of a sovereign exiting an adjustment episode. When instead using this success rate as the dependent variable, most of the estimated coefficients still have the expected signs but their magnitude and significance change somewhat compared to the growth-debt criterion. The market-based indicator gives relatively higher weight to the countries’ own economic characteristics, *i.e.*, growth at programme start, fiscal adjustment and openness. Of the external

<sup>15</sup> An alternative (but more resource-consuming) option would have been to look at the conditions, especially currency, yields, coupons and maturity, at which a country could issue government bonds.

variables, only the VIX remains significant while trading partner demand (which was found to be a key explanatory variable for the previous indicator) becomes insignificant.

### 3.5 *What do our models imply for ongoing programmes in Europe?*

In this section we use the estimated coefficients to investigate implications for the ongoing programmes in Europe. Naturally, the results need to be treated with substantial caution as the results obtained for a large number of adjustment episodes are very likely to miss specific factors conducive to the success or failure of a particular programme. For instance, compared to the “average” country in the sample, the ongoing European programmes (with the exception of Romania) faced a more challenging fiscal and debt situation and lack of exchange rate flexibility. On the other hand they were outliers in terms of institutional quality, GDP per capita and financial depth, all of which *ex ante* could be expected to facilitate adjustment. The adjustment strategy in the euro area programmes, as earlier mentioned, aimed to achieve other issues such as a need to prevent contagion and preserve financial stability, and our indicator cannot assess whether these objectives were met or not.

The exercise also relies to a large extent on projections, which especially for e.g., exchange rate developments are known to be hard to forecast.<sup>16</sup> For other variables, we use available values at end-October 2013. Our success indicator also considers success a resumption of growth and debt reduction, and as such may be especially stringent for countries such as Portugal, that are more vulnerable in that regard compared to others, for instance Ireland, where problems were instead concentrated in the financial sector.

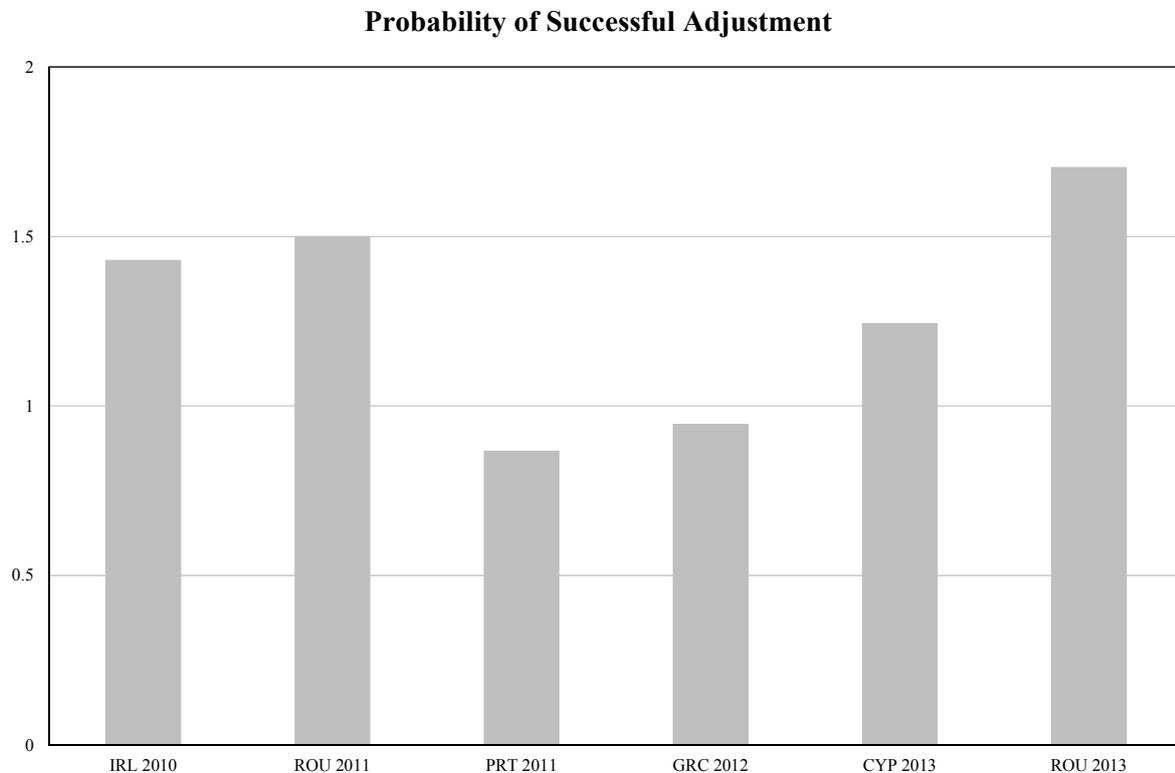
From the chart below, we can see that the European programmes in all cases reach the average probability of success in the sample and exceed it substantially for the majority of countries. Ireland benefits to a large extent from its openness, Romania from its relatively comfortable fiscal and debt situation, and Cyprus both from its relatively open economy but also from entering its programme at a time of much more robust global growth and lower risk aversion compared the other euro area programmes. The second programme in Greece has a success probability quite exactly in line with the average in the sample, which must be considered a major achievement given its very challenging fiscal and debt situation at the onset of the crisis and relatively low openness. Portugal would seem to have a marginally lower success probability, mostly as a result of the success criterion as earlier mentioned being especially challenging for it, but also the adverse global conditions during a large part of the programme period and its relatively low openness. Taken together, this section again underlines the importance of taking both domestic policy achievements and the external environment into account when judging a country’s adjustment process, but also that the progress under the European programmes are substantially higher than sometimes argued.

## 4 **Concluding remarks**

We reviewed more than 170 adjustment episodes, identified by the need to approach the IMF for official assistance, with the aim of identifying factors that help countries resume positive growth and reduce government debt levels. We found that decisive policy action, especially faster fiscal adjustment and progress on financial sector repair, contribute significantly and positively to a successful adjustment episode. Regarding the importance of a functioning financial system, it is

<sup>16</sup> For programmes started after 2012 we assumed that no change occurs in the NEER during the programme. Slight changes in the NEER do not impact the probability of a success substantially.

Figure 5



Note: Conditional probability over unconditional probability. Results obtained using the estimated coefficients in the baseline regression, including structural reforms, and the RE-estimator. Authors' calculations.

important to note that a banking crisis per se need not be detrimental for successful adjustment if the handling of it allows for continued extension of credit to the private sector. We find that initial vulnerabilities in the form of high government debt lowers the chances of successful adjustment, but a large current account deficit does not. More trade openness and exchange rate flexibility helps. The effects of the latter is not clear-cut as only appreciation episodes are found to be conducive to adjustment, contrary to the often-made claim that exchange rate depreciation and an export-led recovery are prerequisites for success. The probability of successful adjustment is also considerably higher if global growth is favourable and risk appetite strong. Our results suggest that more official financing (which conversely is typically coupled with less fiscal adjustment) does not significantly contribute to success, while more stringent conditionality especially in the structural area appears to exert a significantly positive effect.

Our definition of success based on growth and debt developments give a success rate that is about twice a market-based one, proxied by whether a country requested a follow-on programme or not. The fact that two-thirds of countries request follow-on programmes within a three-year horizon is interesting in itself and shows that follow-on programmes need not be considered failures; in fact they are the norm to date.

Our results have important implications for the ongoing adjustment processes in the euro area. Global conditions are forecast to improve over the next years compared to the conditions present during the early days of the crisis, that is, when the programmes for Greece, Portugal and Ireland were put in place. The very adverse conditions under which these countries undertook their

initial adjustment therefore needs to be strongly acknowledged when assessing their progress in restoring growth and debt sustainability. It also means that while more support from external demand can be expected for the programmes starting later such as Cyprus, it is still imperative to continue fiscal consolidation, financial sector and structural reforms. Our results also underline the importance of decreasing the risk of large adjustment needs by reducing vulnerabilities during good times, and therefore the importance of honouring the commitments set out under the new economic governance processes in the EU.

## APPENDIX A DATA SOURCES AND CONSTRUCTION

**IMF GRA-supported adjustment programmes start date and end date:** Source: IMF Monitoring of Fund Arrangements, IMF Annual Reports

**Real GDP growth:** Annual percentage change. Source: IMF World Economic Outlook Database; for a handful observations the data set was complemented from IMF country reports

**Public Debt:** Gross debt of general government or of the public sector broadest coverage available, in percent of GDP. Source: IMF World Economic Outlook Database, IMF Historical Public Debt Database Fall 2012 Vintage, IMF Monitoring of Fund Arrangements, IMF country reports, OECD Economic Outlook, World Bank, Eurostat, Republic of Croatia Ministry of Finance, Ministry of Finance Romania

**Fiscal Balance:** of general government or the public sector broadest coverage available, in percent of GDP. The basic source is the IMF World Economic Outlook Database and missing data was complemented from other sources (see below). Source: IMF World Economic Outlook Database, IMF country reports, IMF (2003), OECD Economic Outlook, World Bank (2002), Peru Reserve Bank, Republic of Turkey Prime Ministry Undersecretariat of Treasury, AMECO, Eurostat

**Primary Balance:** of general government or of the public sector broadest coverage available, in percent of GDP. The basic source is the IMF World Economic Outlook Database and missing data was complemented from other sources (see below). Source: IMF World Economic Outlook Database, IMF country reports, IMF (2003), OECD Economic Outlook, World Bank (2002), Peru Reserve Bank, Republic of Turkey Prime Ministry Undersecretariat of Treasury, AMECO, Eurostat, Bosnia and Herzegovina National Bank Annual Reports, Inter-American Development Bank, Central Bank of Indonesia

**Cyclically Adjusted Balance:** Fiscal balance of general government or of the public sector broadest coverage available, adjusted for cyclical components, in percent of GDP. The output gap was estimated with the Hodrick-Prescott filter using  $\lambda=100$ .

**Cyclically Adjusted Primary Balance:** Primary balance of general government or of the public sector broadest coverage available, adjusted for cyclical components, in percent of GDP. The cyclically adjusted primary balance was obtained by subtracting interest expenditure to the cyclically adjusted balance.

**Adjustment in Net Lending, Primary Balance, Cyclically Adjusted Balance, Cyclically Adjusted Primary Balance:** Difference in the value of the variable, respectively, between the value in the year of the programme end and in the year of the programme start. In case the programme ended between the first and eighth month of the relevant year, the value from the year before the year of the programme end is taken as the value for the year of the programme end. For cases in which the adjustment programme lasted only one year, that is the difference between the start year and end year of the programme is one, no such adjustment is undertaken.

**Real world GDP growth:** Annual percentage change of the real world GDP growth, five year arithmetic average between T+1 and T+5. Source: IMF World Economic Outlook Database

**Banking Crisis:** Dummy variable takes value 1 if a banking crisis was ongoing in the year of the programme start, otherwise 0. For banking crises started in 2008 or afterwards no end date is

provided in the source data base and these crises are marked as still ongoing. Therefore, we assumed that a banking crisis has not ended yet if it started in 2008 or afterwards.<sup>17</sup> *Source: Laeven and Valencia (2012)*

**Credit Crunch:** Dummy variable takes value 1 if real credit advanced to private sector recorded negative growth in at least two years between T and T+2, otherwise 0. The annual percentage change in nominal credit advanced to private sector was corrected for inflationary effects by dividing through the relative change in the GDP deflator.<sup>18</sup> *Source: World Bank, IMF country reports, National Bank of Romania (credit advanced to private sector); IMF World Economic Outlook Database, IMF country reports (nominal GDP and GDP deflator)*

**Exchange Rate Regimes:** Exchange Rate Regime Reinhart and Rogoff Classification, annual fine classification. *Source: Carmen M. Reinhart Author Website, www.carmenreinhart.com*

**Openness indicator:** Exports plus imports divided by GDP at current prices. *Source: Penn World Table 7.1*

**VIX:** Chicago Board of Exchange S&P 500 Implied Volatility Index; annual, calculated as the average of the daily “last price” of the index. *Source: Bloomberg*

**Nominal Effective Exchange Rate (NEER) change:** Percentage change in the nominal effective exchange rate: values in the year of programme end and programme start were compared. In case the programme ended between the first and eighth month of the relevant year, the value from the year before the year of the programme end is taken as the value for the year of the programme end. For cases in which the adjustment programme lasted only one year, that is the difference between the start year and end year of the programme is one, no such adjustment is undertaken. *Source: Darvas (2012)*

**Current Account Balance:** in percent of GDP in USD. *Source: IMF World Economic Outlook Database April 2013; for a handful observations the data set was complemented from IMF country reports*

**Programme Conditionality:** *Source: IMF Monitoring of Fund Arrangements*

**Programme Size, Country Quota and Disbursement:** *Source: IMF Monitoring of Fund Arrangements, IMF Annual Reports, IMF Financial Data Query Tool, IMF Lending Arrangements*

**Consumer Price Index:** *Source: IMF World Economic Outlook*

**Real Effective Exchange Rate:** *Source: Darvas (2012)*

**Nominal Exchange Rate:** *Source: IMF International Financial Statistics; complemented from IMF World Economic Outlook by calculating the ratio of GDP measured in US dollar and home currency*

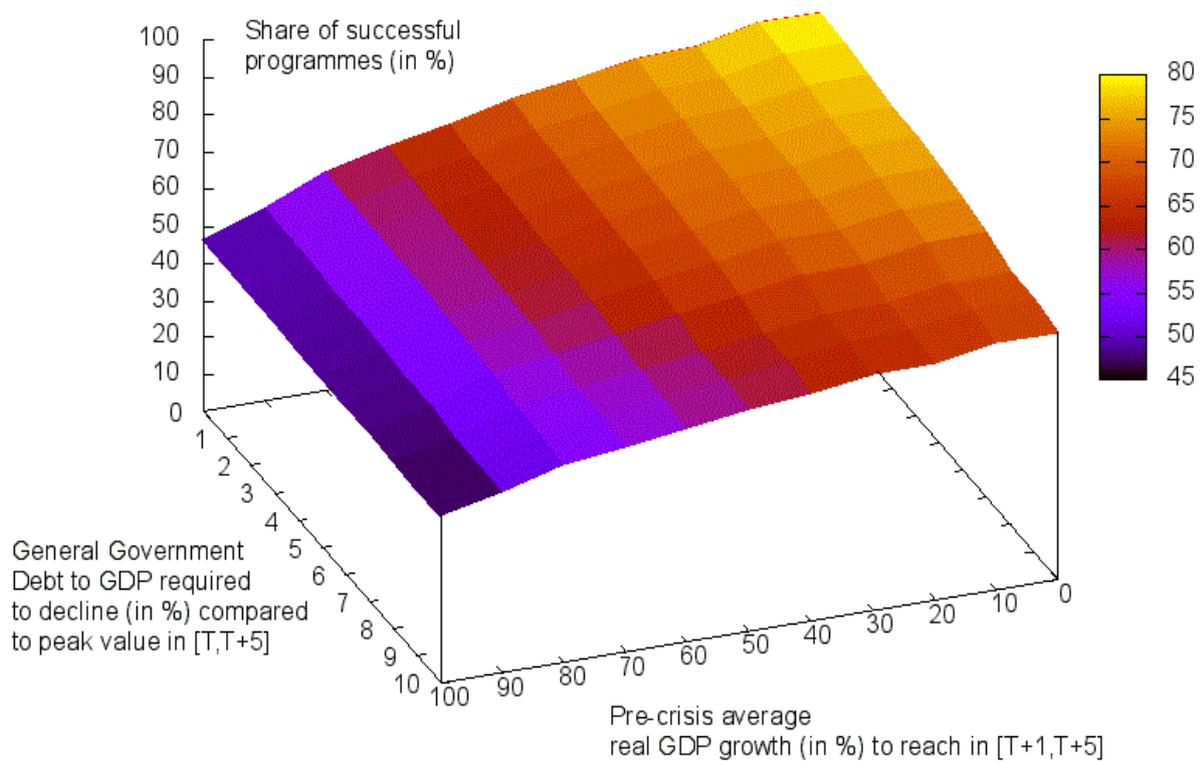
<sup>17</sup> This does not turn out to be an issue as all programmes started in 2011 or afterwards are excluded from the sample.

<sup>18</sup> The nominal values were calculated from the credit advanced to private sector expressed as percentage share nominal GDP by multiplying with the nominal GDP.

**APPENDIX B**  
**SENSITIVITY OF THE SUCCESS RATE**  
**TO VARIATIONS IN THE GROWTH AND DEBT CRITERION**

**Figure 6**

**Share of Successful Programmes Dependent on Percent of Average Pre-crisis Real GDP Growth to be Reached in [T+1,T+5] and Percent Value by Which the Debt-to-GDP Ratio Is Required to Decline Compared with its Peak Value in [T,T+5]**



Note: T denotes the year of programme start.

Source: Authors' calculations.

**APPENDIX C**  
**LIST OF INCLUDED PROGRAMMES**

<b>Country</b>	<b>ISO</b>	<b>Year</b>
Algeria	DZA	1994, 1995
Angola	AGO	2009
Argentina	ARG	1992, 1996, 1998, 2000, 2003
Armenia	ARM	1995, 2009
Azerbaijan	AZE	1995, 1996
Belarus	BLR	1995, 2009
Bolivia	BOL	2003
Bosnia and Herzegovina	BIH	1998, 2002, 2009
Brazil	BRA	1998, 2001, 2002
Bulgaria	BGR	1994, 1996, 1997, 1998, 2002, 2004
Colombia	COL	1999, 2003, 2005
Costa Rica	CRI	1993, 1995, 2009
Croatia	HRV	1994, 1997, 2001, 2003, 2004
Czech Republic	CZE	1993
Dominica	DMA	2002
Dominican Republic	DOM	1993, 2003, 2005, 2009
Ecuador	ECU	1994, 2000, 2003
El Salvador	SLV	1993, 1995, 1997, 1998, 2009, 2010
Estonia	EST	1993, 1995, 1996, 1997, 2000
FYR Macedonia	MKD	1995, 2000, 2003, 2005
Gabon	GAB	1994, 1995, 2000, 2004, 2007
Georgia	GEO	1995, 2008
Greece	GRC	2010
Guatemala	GTM	2002, 2003, 2009
Honduras	HND	2008, 2010
Hungary	HUN	1993, 1996, 2008
Iceland	ISL	2008
Indonesia	IDN	1997, 1998, 2000
Jamaica	JAM	1992, 2010

Jordan	JOR	1994, 1996, 1999, 2002
Kazakhstan	KAZ	1994, 1995, 1996, 1999
Korea	KOR	1997
Latvia	LVA	1993, 1995, 1996, 1997, 1999, 2001, 2008
Lesotho	LSO	1994, 1995, 1996
Lithuania	LTU	1993, 1994, 2000, 2001
Maldives	MDV	2009
Mexico	MEX	1995, 1999
Moldova	MDA	1993, 1995, 1996, 2010
Mongolia	MNG	2009
Pakistan	PAK	1993, 1994, 1995, 1997, 2000, 2008
Panama	PAN	1995, 1997, 2000
Papua New Guinea	PNG	1995, 2000
Paraguay	PRY	2003, 2006
Peru	PER	1993, 1996, 1999, 2001, 2002, 2004, 2007
Philippines	PHL	1994, 1998
Poland	POL	1993, 1994
Republic of Congo	COG	1994
Romania	ROU	1994, 1997, 1999, 2001, 2004, 2009
Russia	RUS	1995, 1996, 1999
Serbia	SRB	2001, 2002, 2009
Seychelles	SYC	2008
Slovak Republic	SVK	1994
Sri Lanka	LKA	2001, 2009
Thailand	THA	1997
Turkey	TUR	1994, 1999, 2002, 2005
Ukraine	UKR	1995, 1996, 1997, 1998, 2004, 2008, 2010
Uruguay	URY	1996, 1997, 1999, 2000, 2002, 2005
Venezuela	VEN	1996
Vietnam	VNM	1993

Source: IMF Monitoring of Fund Arrangements, IMF Annual Reports.

**APPENDIX D**  
**REGRESSION RESULTS (EXTENSIVE)**

Table 3

**Factors Conducive to Successful Adjustment; Results from Probit Regressions – Cyclically-adjusted Primary Balance**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Cycl. Adj. Balance in T</b>	0.146 (0.057)**									
<b>Cycl. Adj. Balance adjustment</b>	0.077 (0.036)**									
<b>Public Debt in T</b>	0.000 (0.003)	-0.006 (0.004)	-0.009 (0.005)*	-0.009 (0.005)*	-0.009 (0.005)*	-0.009 (0.005)*	-0.010 (0.005)*	-0.010 (0.005)**	-0.009 (0.004)**	-0.010 (0.004)**
<b>Real GDP Growth in T</b>	0.068 (0.016)***	0.076 (0.019)***	0.085 (0.021)***	0.094 (0.027)***	0.085 (0.030)***	0.103 (0.030)***	0.115 (0.027)***	0.112 (0.028)***	0.122 (0.034)***	0.117 (0.034)***
<b>Cycl. Adj. Primary Balance in T</b>		0.130 (0.053)**	0.151 (0.051)***	0.141 (0.048)***	0.139 (0.044)***	0.144 (0.037)***	0.131 (0.033)***	0.125 (0.034)***	0.167 (0.042)***	0.171 (0.039)***
<b>Cycl. Adj. Primary Balance adjustment</b>		0.059 (0.036)	0.062 (0.032)*	0.060 (0.032)*	0.060 (0.034)*	0.070 (0.036)**	0.070 (0.037)*	0.079 (0.036)**	0.121 (0.037)***	0.112 (0.041)***
<b>World GDP Growth [T+1,T+5]</b>			1.504 (0.335)***	1.592 (0.317)***	1.707 (0.325)***	1.830 (0.315)***	2.037 (0.295)***	2.241 (0.300)***	2.313 (0.337)***	2.409 (0.364)***
<b>Banking Crisis Dummy</b>				0.763 (0.325)**	0.861 (0.343)**	0.804 (0.352)**	0.873 (0.321)***	1.005 (0.314)***	1.254 (0.439)***	1.269 (0.437)***
<b>Credit Crunch Dummy</b>					-0.506 (0.255)**	-0.556 (0.257)**	-0.553 (0.256)**	-0.528 (0.264)**	-0.582 (0.291)**	-0.609 (0.298)**
<b>Exchange Rate Regime</b>						0.065 (0.033)*	0.083 (0.035)**	0.063 (0.037)*	0.092 (0.037)**	0.088 (0.038)**
<b>Openness Indicator</b>							0.007 (0.003)**	0.007 (0.003)**	0.005 (0.004)	0.004 (0.004)
<b>VIX - S&amp;P 500 Volatility Index</b>								-0.052 (0.020)***	-0.039 (0.021)*	-0.044 (0.022)**
<b>NEER adjustment</b>									0.025 (0.011)**	0.027 (0.012)**
<b>Current Account</b>										-0.013 (0.021)
<b>Adjustment in Current Account Balance</b>										0.021 (0.026)
<b>Constant</b>	0.453 (0.252)*	0.349 (0.272)	-5.002 (1.218)***	-5.477 (1.203)***	-5.694 (1.283)***	-6.646 (1.282)***	-8.069 (1.214)***	-7.692 (1.243)***	-8.337 (1.499)***	-8.454 (1.523)***
<b>N</b>	176	176	176	176	176	176	176	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and\*\*\* denote significance at the 10, 5 and 1% levels, respectively. Source: Authors' calculations.

Table 4

## Primary Balance

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.387021 (0.535755)***	2.171238 (0.421878)***	2.171238 (0.310862)***
Real GDP Growth in T	0.105260 (0.031853)***	0.093980 (0.026351)***	0.093980 (0.030635)***
Primary Balance in T	0.129054 (0.043714)***	0.114185 (0.035841)***	0.114185 (0.038460)***
Primary Balance Adjustment	0.142981 (0.048720)***	0.127853 (0.042417)***	0.127853 (0.039984)***
Public Debt in T	-0.008006 (0.003985)**	-0.007228 (0.003479)**	-0.007228 (0.003206)**
Banking Crisis Dummy	1.365305 (0.435149)***	1.239851 (0.358202)***	1.239851 (0.384019)***
Exchange Rate Regime	0.102142 (0.039269)***	0.092435 (0.034783)***	0.092435 (0.032218)***
VIX– S&P 500 Volatility Index	-0.047997 (0.022318)**	-0.043895 (0.019855)**	-0.043895 (0.020475)**
Openness Indicator	0.008131 (0.003849)**	0.007555 (0.003536)**	0.007555 (0.003678)**
NEER Adjustment	0.024733 (0.009631)**	0.021895 (0.007908)***	0.021895 (0.009775)**
Credit Crunch Dummy	-0.588661 (0.285740)**	-0.529840 (0.258805)**	-0.529840 (0.262547)**
Constant	-8.687828 (2.059537)***	-7.909802 (1.679219)***	-7.909802 (1.379751)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 5

## Cyclically-adjusted Primary Balance

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.868541 (0.708928)***	2.313229 (0.453264)***	2.313229 (0.337369)***
Real GDP Growth in T	0.161021 (0.049910)***	0.121781 (0.028783)***	0.121781 (0.034005)***
Cycl. Adj. Primary Balance in T	0.225636 (0.072852)***	0.166524 (0.038395)***	0.166524 (0.041968)***
Cycl. Adj. Primary Balance Adjustment	0.162861 (0.058176)***	0.121484 (0.038072)***	0.121484 (0.037306)***
Public Debt in T	-0.011298 (0.005372)**	-0.008759 (0.003804)**	-0.008759 (0.003881)**
Banking Crisis Dummy	1.638089 (0.585535)***	1.253814 (0.379211)***	1.253814 (0.439020)***
Exchange Rate Regime	0.114579 (0.049927)**	0.092122 (0.037230)**	0.092122 (0.037094)**
VIX – S&P 500 Volatility Index	-0.049029 (0.026938)*	-0.039109 (0.020705)*	-0.039109 (0.021024)*
Openness Indicator	0.005600 (0.004830)	0.005175 (0.003760)	0.005175 (0.003896)
NEER Adjustment	0.034842 (0.013543)**	0.025388 (0.008384)***	0.025388 (0.010831)**
Credit Crunch Dummy	-0.735546 (0.345290)**	-0.582245 (0.268509)**	-0.582245 (0.291027)**
Constant	-10.258414 (2.670068)***	-8.336743 (1.803321)***	-8.336743 (1.498705)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and\*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 6

## Disbursement

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.386287 (0.539171)**	2.165201 (0.422003)***	2.165201 (0.311944)***
Real GDP Growth in T	0.103716 (0.032186)**	0.092362 (0.026655)***	0.092362 (0.031001)***
Primary Balance in T	0.127417 (0.044060)**	0.112492 (0.036006)***	0.112492 (0.039489)***
Primary Balance Adjustment	0.141404 (0.049046)**	0.126228 (0.042494)***	0.126228 (0.040927)***
Public Debt in T	-0.007429 (0.004216)*	-0.006723 (0.003679)*	-0.006723 (0.003503)*
Banking Crisis Dummy	1.375428 (0.439406)**	1.244862 (0.358188)***	1.244862 (0.387038)***
Exchange Rate Regime	0.106475 (0.040948)**	0.095903 (0.035921)***	0.095903 (0.034916)***
VIX– S&P 500 Volatility Index	-0.047605 (0.022351)**	-0.043492 (0.019853)**	-0.043492 (0.020480)**
Openness Indicator	0.008127 (0.003862)**	0.007552 (0.003537)**	0.007552 (0.003693)**
NEER Adjustment	0.024819 (0.009706)**	0.021882 (0.007904)***	0.021882 (0.009887)**
Credit Crunch Dummy	-0.586852 (0.286044)**	-0.526013 (0.258575)**	-0.526013 (0.265454)**
Disbursement	-0.144227 (0.356348)	-0.123067 (0.317620)	-0.123067 (0.341586)
Constant	-8.650911 (2.072662)**	-7.859367 (1.683311)***	-7.859367 (1.410155)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 7

## Size to Quota

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.397339 (0.531328)***	2.210429 (0.427870)***	2.210429 (0.301402)***
Real GDP Growth in T	0.106135 (0.031609)***	0.096284 (0.026781)***	0.096284 (0.029524)***
Primary Balance in T	0.130395 (0.043278)***	0.117548 (0.036495)***	0.117548 (0.040772)***
Primary Balance Adjustment	0.142172 (0.048135)***	0.129099 (0.042679)***	0.129099 (0.040962)***
Public Debt in T	-0.007976 (0.003936)**	-0.007303 (0.003486)**	-0.007303 (0.003295)**
Banking Crisis Dummy	1.314626 (0.438806)***	1.203880 (0.370167)***	1.203880 (0.437868)***
Exchange Rate Regime	0.104777 (0.039224)***	0.096738 (0.035198)***	0.096738 (0.032307)***
VIX – S&P 500 Volatility Index	-0.051285 (0.023089)**	-0.047665 (0.020969)**	-0.047665 (0.022289)**
Openness Indicator	0.008381 (0.003825)**	0.007868 (0.003555)**	0.007868 (0.003600)**
NEER Adjustment	0.025465 (0.009723)***	0.022995 (0.008049)***	0.022995 (0.008307)***
Credit Crunch Dummy	-0.600109 (0.285151)**	-0.551736 (0.261361)**	-0.551736 (0.264993)**
Programme Size to IMF Quota	0.000192 (0.000372)	0.000192 (0.000350)	0.000192 (0.000415)
Constant	-8.731203 (2.043721)***	-8.057676 (1.698701)***	-8.057676 (1.311324)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and\*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 8

## Drawn to Quota

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.391025 (0.525470)***	2.228613 (0.428796)***	2.228613 (0.299994)***
Real GDP Growth in T	0.106465 (0.031297)***	0.097852 (0.027036)***	0.097852 (0.029507)***
Primary Balance in T	0.129868 (0.042786)***	0.118630 (0.036537)***	0.118630 (0.040489)***
Primary Balance Adjustment	0.140956 (0.047676)***	0.129670 (0.042870)***	0.129670 (0.040789)***
Public Debt in T	-0.008068 (0.003911)**	-0.007479 (0.003515)**	-0.007479 (0.003381)**
Banking Crisis Dummy	1.290104 (0.430762)***	1.195090 (0.366852)***	1.195090 (0.406945)***
Exchange Rate Regime	0.104833 (0.038638)***	0.097983 (0.035097)***	0.097983 (0.032080)***
VIX – S&P 500 Volatility Index	-0.053425 (0.022898)**	-0.050095 (0.021014)**	-0.050095 (0.022556)**
Openness Indicator	0.008556 (0.003776)**	0.008099 (0.003555)**	0.008099 (0.003637)**
NEER Adjustment	0.025836 (0.009693)***	0.023675 (0.008128)***	0.023675 (0.007852)***
Credit Crunch Dummy	-0.601367 (0.283449)**	-0.560416 (0.262650)**	-0.560416 (0.266485)**
Amount Drawn to IMF Quota	0.000432 (0.000472)	0.000419 (0.000454)	0.000419 (0.000531)
Constant	-8.691459 (2.020758)***	-8.107554 (1.701071)***	-8.107554 (1.304348)***
N	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 9

## Drawn to Size

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.378252 (0.530213)***	2.174190 (0.422204)***	2.174190 (0.303218)***
Real GDP Growth in T	0.109629 (0.031932)***	0.098608 (0.026724)***	0.098608 (0.029016)***
Primary Balance in T	0.131291 (0.043806)***	0.117197 (0.036259)***	0.117197 (0.038780)***
Primary Balance Adjustment	0.145584 (0.048803)***	0.131043 (0.043030)***	0.131043 (0.039959)***
Public Debt in T	-0.009574 (0.004342)**	-0.008726 (0.003813)**	-0.008726 (0.003695)**
Banking Crisis Dummy	1.366770 (0.435117)***	1.246060 (0.364175)***	1.246060 (0.387880)***
Exchange Rate Regime	0.095661 (0.039463)**	0.086919 (0.035432)**	0.086919 (0.034561)**
VIX – S&P 500 Volatility Index	-0.052588 (0.022995)**	-0.048297 (0.020283)**	-0.048297 (0.020539)**
Openness Indicator	0.008531 (0.003875)**	0.007928 (0.003583)**	0.007928 (0.003772)**
NEER Adjustment	0.023555 (0.009548)**	0.021009 (0.008024)***	0.021009 (0.009559)**
Credit Crunch Dummy	-0.590207 (0.287014)**	-0.535527 (0.260814)**	-0.535527 (0.262761)**
Amount Drawn to Programme Size	0.004160 (0.003918)	0.003870 (0.003551)	0.003870 (0.003795)
Constant	-8.675547 (2.038132)***	-7.935771 (1.681617)***	-7.935771 (1.344869)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and\*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 10

## Conditionality – Total Number

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.550609 (0.584051)***	2.220153 (0.436260)***	2.220153 (0.325883)***
Real GDP Growth in T	0.112839 (0.034730)***	0.094813 (0.027186)***	0.094813 (0.033885)***
Primary Balance in T	0.129580 (0.045743)***	0.109261 (0.036663)***	0.109261 (0.042921)**
Primary Balance Adjustment	0.143266 (0.051512)***	0.122494 (0.042387)***	0.122494 (0.038664)***
Public Debt in T	-0.008045 (0.004275)*	-0.006993 (0.003516)**	-0.006993 (0.003247)**
Banking Crisis Dummy	1.411400 (0.465797)***	1.208036 (0.366583)***	1.208036 (0.368495)***
Exchange Rate Regime	0.106630 (0.043287)**	0.094047 (0.036559)**	0.094047 (0.035082)***
VIX – S&P 500 Volatility Index	-0.068092 (0.027001)**	-0.057206 (0.021034)***	-0.057206 (0.022847)**
Openness Indicator	0.010204 (0.004357)**	0.008920 (0.003737)**	0.008920 (0.004187)**
NEER Adjustment	0.029344 (0.011040)***	0.024599 (0.008407)***	0.024599 (0.009437)***
Credit Crunch Dummy	-0.654349 (0.311494)**	-0.576937 (0.265283)**	-0.576937 (0.250894)**
All Conditions	0.016763 (0.007244)**	0.014286 (0.005829)**	0.014286 (0.005067)***
Constant	-9.647083 (2.290746)***	-8.430064 (1.769194)***	-8.430064 (1.425315)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 11

## Conditionality – Quantitative vs. Structural

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.546343 (0.585524)***	2.216554 (0.437349)***	2.216554 (0.327444)***
Real GDP Growth in T	0.112551 (0.034750)***	0.094547 (0.027218)***	0.094547 (0.033966)***
Primary Balance in T	0.129011 (0.045894)***	0.108690 (0.036820)***	0.108690 (0.043836)**
Primary Balance Adjustment	0.142166 (0.051878)***	0.121485 (0.042668)***	0.121485 (0.038942)***
Public Debt in T	-0.008021 (0.004280)*	-0.006976 (0.003517)**	-0.006976 (0.003252)**
Banking Crisis Dummy	1.408852 (0.465930)***	1.205785 (0.366118)***	1.205785 (0.367197)***
Exchange Rate Regime	0.107660 (0.043721)**	0.094952 (0.036870)**	0.094952 (0.035853)***
VIX – S&P 500 Volatility Index	-0.069985 (0.029238)**	-0.058850 (0.023149)**	-0.058850 (0.024076)**
Openness Indicator	0.010177 (0.004360)**	0.008899 (0.003739)**	0.008899 (0.004199)**
NEER Adjustment	0.029127 (0.011126)***	0.024382 (0.008488)***	0.024382 (0.009531)**
Credit Crunch Dummy	-0.646598 (0.314166)**	-0.570694 (0.266337)**	-0.570694 (0.244589)**
Quantitative Performance Criteria	0.010736 (0.035824)	0.009051 (0.030989)	0.009051 (0.025830)
Structural Conditions	0.017277 (0.007877)**	0.014735 (0.006328)**	0.014735 (0.005086)***
Constant	-9.539933 (2.372770)***	-8.336994 (1.857071)***	-8.336994 (1.514086)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and\*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 12

## Conditionality – All Condition Types

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.738735 (0.654541)***	2.301346 (0.467092)***	2.301346 (0.309019)***
Real GDP Growth in T	0.115706 (0.036507)***	0.094214 (0.027304)***	0.094214 (0.031367)***
Primary Balance in T	0.133108 (0.050477)***	0.107699 (0.037846)***	0.107699 (0.042131)**
Primary Balance Adjustment	0.156987 (0.054665)***	0.129645 (0.042391)***	0.129645 (0.034931)***
Public Debt in T	-0.008559 (0.004653)*	-0.007302 (0.003673)**	-0.007302 (0.003342)**
Banking Crisis Dummy	1.460414 (0.505197)***	1.208460 (0.379940)***	1.208460 (0.359993)***
Exchange Rate Regime	0.126152 (0.047661)***	0.108622 (0.038417)***	0.108622 (0.036800)***
VIX – S&P 500 Volatility Index	-0.075643 (0.031524)**	-0.061506 (0.024003)**	-0.061506 (0.025456)**
Openness Indicator	0.010110 (0.004674)**	0.008781 (0.003947)**	0.008781 (0.004712)*
NEER Adjustment	0.031961 (0.012001)***	0.025877 (0.008518)***	0.025877 (0.008206)***
Credit Crunch Dummy	-0.651668 (0.333281)*	-0.552533 (0.270208)**	-0.552533 (0.241235)**
Prior Action/ Necessary for Review Completion	0.028004 (0.016059)*	0.023219 (0.012619)*	0.023219 (0.010862)**
Structural Performance Criteria	0.087056 (0.049434)*	0.073962 (0.040619)*	0.073962 (0.031686)**
Structural Benchmarks	0.000862 (0.012798)	0.000974 (0.010840)	0.000974 (0.010907)
Quantitative Performance Criteria	-0.010615 (0.040192)	-0.009479 (0.033529)	-0.009479 (0.028670)
Constant	-9.929770 (2.565440)***	-8.408188 (1.933841)***	-8.408188 (1.417475)***
N	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 13

## Primary Balance – Criteria: 3/4 of Average Growth and 4 Years for Debt Reduction

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.194559 (0.500478)***	1.925270 (0.380114)***	1.925270 (0.304083)***
Real GDP Growth in T	0.106245 (0.032602)***	0.091920 (0.025503)***	0.091920 (0.028460)***
Primary Balance in T	0.132666 (0.045353)***	0.112958 (0.035373)***	0.112958 (0.037628)***
Primary Balance Adjustment	0.135877 (0.048632)***	0.116847 (0.040682)***	0.116847 (0.036143)***
Public Debt in T	-0.007577 (0.004079)*	-0.006608 (0.003436)*	-0.006608 (0.003133)**
Banking Crisis Dummy	1.198027 (0.422936)***	1.044218 (0.336934)***	1.044218 (0.359450)***
Exchange Rate Regime	0.099453 (0.039692)**	0.087446 (0.033968)**	0.087446 (0.031610)***
VIX – S&P 500 Volatility Index	-0.046315 (0.022495)**	-0.041213 (0.019291)**	-0.041213 (0.019709)**
Openness Indicator	0.007612 (0.003958)*	0.006947 (0.003510)**	0.006947 (0.003562)*
NEER Adjustment	0.025351 (0.009891)**	0.021646 (0.007793)***	0.021646 (0.009287)**
Credit Crunch Dummy	-0.498975 (0.282675)*	-0.431412 (0.250451)*	-0.431412 (0.265880)
Constant	-8.020013 (1.935645)***	-7.049251 (1.538704)***	-7.049251 (1.366748)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 14

**Primary Balance – Criteria: 2/3 of Average Growth and 4 Years for Debt Reduction**

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	1.873924 (0.435125)***	1.663717 (0.352732)***	1.663717 (0.318219)***
Real GDP Growth in T	0.091490 (0.029525)***	0.080258 (0.024307)***	0.080258 (0.023921)***
Primary Balance in T	0.108241 (0.039437)***	0.095236 (0.033536)***	0.095236 (0.034963)***
Primary Balance Adjustment	0.110828 (0.045142)**	0.097421 (0.039522)**	0.097421 (0.032687)***
Public Debt in T	-0.006361 (0.003927)	-0.005531 (0.003354)*	-0.005531 (0.002901)*
Banking Crisis Dummy	1.032273 (0.383941)***	0.908710 (0.320185)***	0.908710 (0.328248)***
Exchange Rate Regime	0.092405 (0.037308)**	0.082490 (0.032510)**	0.082490 (0.028525)***
VIX – S&P 500 Volatility Index	-0.039069 (0.020788)*	-0.035152 (0.018592)*	-0.035152 (0.020106)*
Openness Indicator	0.008110 (0.003834)**	0.007336 (0.003399)**	0.007336 (0.003253)**
NEER Adjustment	0.015473 (0.008389)*	0.013262 (0.007045)*	0.013262 (0.006178)**
Credit Crunch Dummy	-0.569657 (0.270212)**	-0.511993 (0.240426)**	-0.511993 (0.244548)**
Constant	-6.895223 (1.733543)***	-6.129089 (1.441207)***	-6.129089 (1.315802)***
N	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

Table 15

## Primary Balance – Criteria: 2/3 of Average Growth and 5 Years for Debt Reduction

	RE	PA	PA-Robust
World GDP Growth [T+1,T+5]	2.040549 (0.465096)***	1.860293 (0.384513)***	1.860293 (0.344065)***
Real GDP Growth in T	0.091189 (0.029180)***	0.081678 (0.025001)***	0.081678 (0.025395)***
Primary Balance in T	0.105780 (0.038596)***	0.095181 (0.033753)***	0.095181 (0.035578)***
Primary Balance Adjustment	0.118074 (0.045567)***	0.106708 (0.040876)***	0.106708 (0.035553)***
Public Debt in T	-0.006750 (0.003876)*	-0.006048 (0.003382)*	-0.006048 (0.002978)**
Banking Crisis Dummy	1.196892 (0.397016)***	1.084896 (0.337454)***	1.084896 (0.345860)***
Exchange Rate Regime	0.094878 (0.037253)**	0.086408 (0.033131)***	0.086408 (0.029021)***
VIX – S&P 500 Volatility Index	-0.040668 (0.020790)*	-0.037250 (0.019069)*	-0.037250 (0.020948)*
Openness Indicator	0.008469 (0.003774)**	0.007808 (0.003407)**	0.007808 (0.003351)**
NEER Adjustment	0.015275 (0.008330)*	0.013422 (0.007171)*	0.013422 (0.006472)**
Credit Crunch Dummy	-0.650229 (0.274236)**	-0.597976 (0.247213)**	-0.597976 (0.237049)**
Constant	-7.464828 (1.839656)***	-6.810967 (1.548210)***	-6.810967 (1.387450)***
<i>N</i>	176	176	176

Note: For variable definitions, please see Box 1. T denotes the year of programme start. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. RE denotes the random-effects model, PA the population averaged model and PA-Robust stands for the population-averaged model with heteroscedasticity-robust variance calculation. Source: Authors' calculations.

## REFERENCES

- Abiad, A., G. Dell’Ariccia and B. Li (2011), “Creditless Recoveries”, International Monetary Fund, Working Paper, No. 11/58.
- Alesina, A. and R. Perotti (1995), “Fiscal Expansions and Fiscal Adjustments in OECD Countries”, NBER, Working Paper, No. 5214.
- Alesina, A. and S. Ardagna (1998), “Tales of Fiscal Adjustment”, *Economic Policy*, Vol. 13, No. 27, pp. 489-585.
- Atoyan, R. and P. Conway (2005), “Evaluating the Impact of IMF Programs: A Comparison of Matching and Instrumental-variable Estimation”, *The Review of International Organizations*, Vol. 1, No. 2, pp. 99-124.
- Barrios, S. and S. Langedijk (2010), “Fiscal Consolidation with External Imbalances”, in “External Imbalances and Public Finances in the EU”, *European Economy*, Occasional Paper, No. 66.
- Barro, R. and J.W. Lee (2005), “IMF Programs: Who is Chosen and What Are the Effects?”, *Journal of Monetary Economics*, Vol. 52, No. 7, pp. 1245-69.
- Bas, M. and R. Stone (2011), “If Life Sends You Lemons: Adverse Selection and Growth under IMF Programs”, available at: [http://www.rochester.edu/College/PSC/stone/working\\_papers/IMFGrowth3.pdf](http://www.rochester.edu/College/PSC/stone/working_papers/IMFGrowth3.pdf)
- Blanchard, O. and D. Leigh (2013), “Growth Forecast Errors and Fiscal Multipliers”, IMF, Working Paper, No. 13/1.
- Calvo, G., A. Izquierdo and E. Talvi (2006), “Sudden Stops and Phoenix Miracles in Emerging Markets”, *American Economic Review*, Papers and Proceedings, Vol. 96, No. 2, pp. 405-10.
- Cerra, V. and S.C. Saxena (2008), “Growth Dynamics: The Myth of Economic Recovery”, *American Economic Review*, Vol. 98, No. 1, pp. 439-57.
- de Cos, P.H. and E. Moral-Benito (2014), “The Role of Public Wages in Fiscal Consolidation Processes”, paper presented at the ECFIN workshop *Government Wage Bill: Determinants, Interactions and Effects*.
- Darvas, Z. (2012), “Real Effective Exchange Rates for 178 Countries: A New Database”, Bruegel, Working Paper, No. 2012/06.
- Dreher, A. (2006), “IMF and Economic Growth: The Effects of Programs, Loans and Compliance with Conditionality”, *World Development*, Vol. 34, No. 5, pp. 769-88.
- Ghosh, A., T. Lane, M. Schulze-Gattas, A. Bulir, J. Hamann and A. Mourmouras (2002), “IMF Supported Programs in Capital Account Crises”, International Monetary Fund, Occasional Paper, No. 210.
- Guichard, S., M. Kennedy, E. Wurzel and C. André (2007), “What Promotes Fiscal Consolidation: OECD Country Experiences”, OECD, Economics Department, Working Paper, No. 553.
- von Hagen J., A. Hughes-Hallett and R. Strauch (2001), “Budgetary Consolidation in EMU”, *European Economy*, Economic Paper, No. 148.
- (2002), “Budgetary Consolidation in Europe: Quality, Economic Conditions, and Persistence”, *Journal of the Japanese and International Economies*, No. 16, pp. 512-35.
- von Hagen, J., R. Perotti and R. Strauch (1998), “Sustainable Public Finances”, London, CEPR.

- von Hagen, J. and R. Strauch (2001), "Fiscal Consolidations: Quality, Economic Conditions, and Success", *Public Choice*, No. 109, pp. 327-46.
- Hardoy, I. (2003), "Effect of IMF Programmes on Growth: A Reappraisal Using the Method of Matching", paper presented at the *European Economic Association*, Stockholm, August 20-24.
- Herndon, T., M. Ash and R. Pollin (2013), "Does Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff", available at: [http://www.peri.umass.edu/fileadmin/pdf/working\\_papers/working\\_papers\\_301-350/WP322.pdf](http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_301-350/WP322.pdf)
- Hutchison, M. (2004), "Selection Bias and Output Costs in IMF Programs", EPRU, Working Paper, No. 04-15, available at: <http://www.econ.ku.dk/epru/files/wp/wp-04-15.pdf>
- International Monetary Fund (2009), "From Recession to Recovery: How Soon and How Strong?", *World Economic Outlook*, Ch. 3. pp. 97-132.
- (2012), "Background Paper 3: Outcomes of Fund-Supported Programs", in *2011 Review of Conditionality*.
- (2003), "Lessons from the Crisis in Argentina", prepared by the Policy Development and Review Department in consultation with the other Departments.
- Laeven, L. and F. Valencia (2012), "Systemic Banking Crisis Database: An Update", International Monetary Fund, Working Paper, No. 12/63.
- Lamo, A., E. Moral-Benito and J. Pérez (2014), "Austerity Through Public Employment in Bad Times: Exploiting the Crowding-out and the Competitiveness Channels?", paper presented at the ECFIN workshop *Government Wage Bill: Determinants, Interactions and Effects*.
- Larch, M. and A. Turrini (2011), "Received Wisdom and Beyond: Lessons from Fiscal Consolidation in the EU", *National Institute Economic Review*, National Institute of Economic and Social Research, Vol. 217, No. 1, pp. R1-R18, July.
- Mise, E., T.H. Kim and P. Newbold (2005), "On Suboptimality of the Hodrick-Prescott Filter at Time Series Endpoints", *Journal of Macroeconomics*, No. 27, pp. 53-67.
- Przeworski, A. and J.R. Vreeland (2000), "The Effect of IMF Programs on Economic Growth", *Journal of Development Economics*, Vol. 62, pp. 385-421.
- Reinhart, C. and K.S. Rogoff (2010), "Growth in a Time of Debt", *American Economic Review*, Papers and Proceedings, No. 100, pp. 573-78, May.
- Steinwand, M. and R. Stone (2008), "The International Monetary Fund: A Review of Recent Evidence", *Review of International Organizations*, Vol. 3, No. 2, pp. 123-49.
- The World Bank (2002), "Regaining Fiscal Sustainability and Enhancing Effectiveness in Croatia".