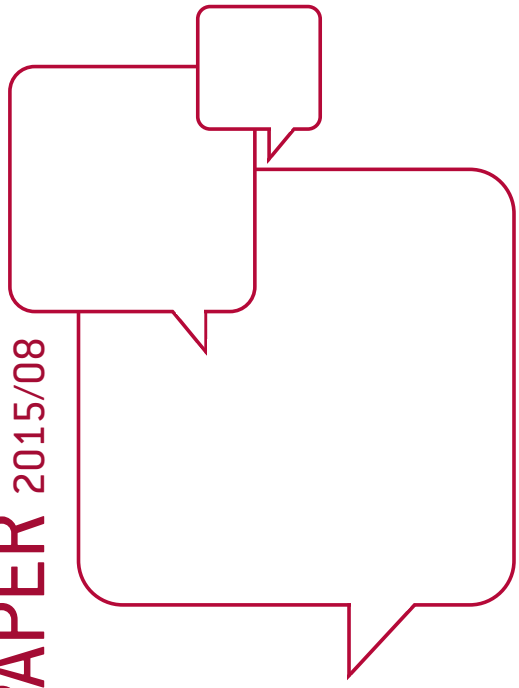


BRUEGEL WORKING PAPER 2015/08

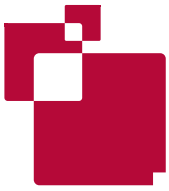
# THE GRAND DIVERGENCE: GLOBAL AND EUROPEAN CURRENT ACCOUNT SURPLUSES

ZSOLT DARVAS

## Highlights

- Global current account imbalances widened before the 2007/2008 crisis and have narrowed since. While the post-crisis adjustment of European current account deficits was in line with global developments (though more forceful), European current account surpluses defied global trends and increased.
- We use panel econometric models to analyse the determinants of medium-term current account balances. Our results confirm that higher fiscal balances, higher GDP per capita, more rapidly aging populations, larger net foreign assets, larger oil rents and better legal systems increase the medium-term current account balance, while a larger growth differential and a higher old-age dependency ratio reduce it.
- European current account surpluses became excessive during the past twelve years according to our estimates, while they were in line with model predictions in the preceding three decades.
- Generally, the gap between the actual current account and its fitted value in the model has a strong predictive power for future current account changes. Excess deficits adjust more forcefully than excess surpluses. However, in the 2004-07 period, excess imbalances were amplified, which was followed by a forceful correction in 2008-15, with the exception of European surpluses

**Zsolt Darvas** (zsolt.darvas@bruegel.org) is a Senior Fellow at Bruegel, at the Centre for Economic and Regional Studies of the Hungarian Academy of Sciences and at Corvinus University of Budapest. The author is grateful to Bruegel colleagues and participants at the CESifo-Delphi Conference on Current Account Adjustments for comments and suggestions, to Menzie D. Chinn and Eswar S. Prasad for their suggestions for incorporating financial development into the model, and to Pia Hüttl, Alvaro Leandro and Allison Mandra for research assistance.

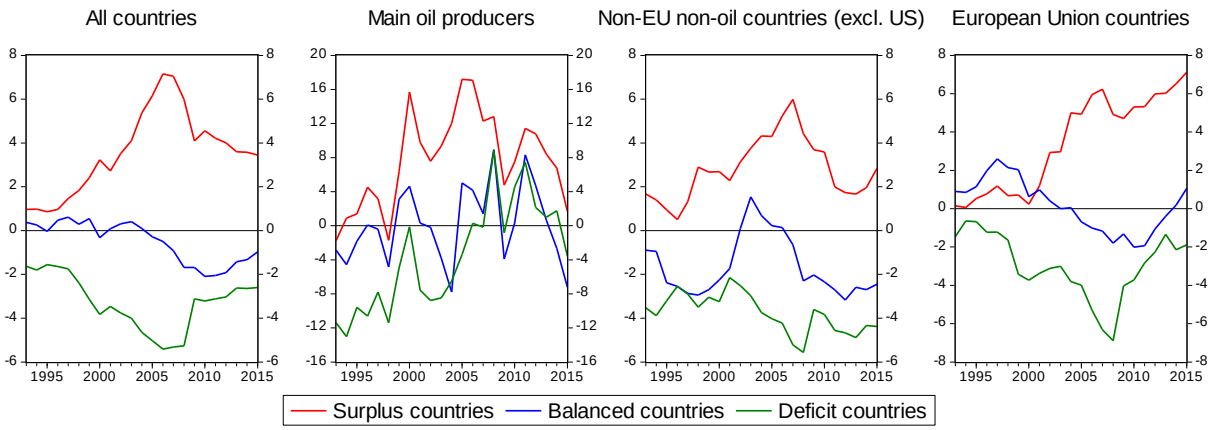


AUGUST 2015

## 1.Introduction

From the mid-1990s to the global economic and financial crisis, global current account imbalances widened significantly. Figure 1 shows that the aggregate position of the world's 57 'surplus countries' increased from a surplus of 1 percent of their GDP in the mid-1990s to about 7 percent by 2007, after which a steady decline started. The aggregate current account position of 115 'deficit countries' deteriorated to about -5 percent of their GDP by the crisis, which was followed by a correction. Clearly, global current account imbalances have significantly narrowed since 2008.

**Figure 1: Global current account balances (% GDP), 1993-2015**




*Source: author's calculations using the April 2015 IMF World Economic Outlook.*

*Note: we use the average current account balance in 2000-2007 to separate surplus (larger than 1% of GDP), balanced (between 1% and -1% of GDP) and deficit (below -1% of GDP) countries. Thereby we separate the 187 countries in our sample to 57 'surplus countries', 15 'balanced countries' and 115 'deficit countries'. The three country sub-groups include 28 main oil producers (19 surplus, 3 balanced, 6 deficit), 28 European Union countries (8-2-18) and 130 non-EU non-oil countries excluding the United States (30-10-90). We excluded the United States from the third panel, because US current account developments are strongly influenced by the central role of the US dollar in the international monetary system and due to its large size, as the US would dominate the aggregate of non-EU non-oil deficit countries. Main oil producers are defined as oil rents more than 10% of GDP on average. The current account balance is expressed in percent of the group GDP.*

The correction of global imbalances was not just the result of smaller surpluses in the main oil-exporting countries. The second panel of Figure 1 shows that the combined surplus of the main oil producers reduced close to zero by 2015, so these countries surely played a role. Yet the third panel, which reports the position of non-EU countries which are not among the main oil producers, also shows a major decline in their surplus from about 6 percent of GDP in 2007 to about 2 percent in 2014, even if there is a slight expected increase in 2015.

European Union current account surplus developments were different from the rest of the world in recent years. There was only a small drop in the surplus from 6 percent of GDP in 2007 to about 5 percent in 2008-09, but since then a steady increase has started and the expected surplus for 2015 is over 7 percent (panel 4 of Figure 1). While EU current account deficits have forcefully corrected, the large and even increasing surpluses moved the EU's aggregate position from a broadly balanced position before the global economic and financial crisis to a sizeable surplus. Thereby the EU became a major contributor to global current account imbalances.

Euro-area surplus countries, and in particular the Netherlands and Germany, are the key contributors to the EU's current account surplus, yet Denmark (which maintains a fixed exchange rate to the euro) and Sweden (which has a floating exchange rate) also report large and persistent surpluses.

Different narratives can explain the increasing EU current account surplus. The persistently high current surplus in a number of EU countries could be justified by various fundamentals, such as the rapid aging of populations, which might require the accumulation of savings. Another possible reason could be weak domestic demand and economic developments (both in deficit and surplus countries), which temporarily depress imports relative to exports. And regarding the adjustment of pre-crisis current account deficits, it is arguable that they became 'excessive' before the crisis in a number of EU countries and these deficits were bound to correct, thereby increasing the aggregate current account surplus of the EU.

How important are these possible explanations for the increased current account surplus of the euro area and the EU? Why do post-crisis EU current account surplus developments differ so much from the developments in the surpluses of non-EU non-oil producer countries? How large were 'excess' current account deficits inside and outside the EU? In this paper, we answer these questions by estimating panel-econometric models to uncover the medium-term determinants of current account balances.

## 2.Methodology

There is growing literature on estimating the medium-term determinants of current account balances with panel econometric techniques. See for example, Chinn and Prasad (2003), Gruber and Kamin (2007), Chinn and Ito (2007), Gagnon (2011), Lane and Milesi-Ferretti (2012), Cheung, Furceri and Rusticelli (2013), Chinn, Eichengreen and Ito (2014) and various IMF reports. These papers estimate the model:

$$(1) \qquad CA_{i,t} = \alpha + \beta_1 \cdot x_{i,t}^{(1)} + \beta_2 \cdot x_{i,t}^{(2)} + \cdots + \beta_k \cdot x_{i,t}^{(k)} + \varepsilon_{i,t} \quad ,$$

where $CA_{i,t}$ is the current account balance (% of GDP) of country *i* in period *t*, $x_{i,t}^{(j)}$ is the *j*-th explanatory variable of country *i* in period *t*, $\beta_j$ is the parameter of the *j*-th explanatory variable and $\varepsilon_{i,t}$ is the error term. Most researchers estimate this model on 4 or 5-year long non-overlapping sample periods to eliminate the impact of business cycles and use various theories to motivate the explanatory variables. We do not add any country-specific or time fixed effects, because we are interested in studying the impacts of the fundamental determinants only.

The most frequently used explanatory variables are the following:

- Fiscal balance (expected sign: positive): a deviation from Ricardian Equivalence will imply that an increased fiscal deficit will lower national savings and thereby deteriorate the current account balance. Similarly to Lane and Milesi-Ferretti (2012), we measure fiscal balance relative to the weighted average of trading partners (as a percent of GDP). In order to have a full sample from 1972 onwards, we are bound to use only 41 trading parents for which data is available from 1972 as the reference group.
- Economic growth (expected sign: negative): faster economic growth can indicate faster productivity growth, which could attract capital inflows and thereby worsen the current account balance. We measure economic growth with real GDP growth relative to the weighted average of 59 trading partners.

- Stage of economic development (expected sign: positive): lower level of development offers higher rate of return on capital according to neoclassical theory, which implies that capital should flow from rich to poor countries, thus poor countries are expected to have current account deficits. We measure the stage of economic development with GDP per capita relative to the weighted average of 59 trading partners.
- Various demographic variables were used in the literature:
    - Young-age and old-age dependency ratios (expected sign: negative): the life-cycle hypothesis suggests that young and old people save less, thus countries with high young-age and old-age dependency ratios tend to have larger current account deficits;
    - Population growth (expected sign: negative): fast population growth might suggest an increase in the share of young people, and thereby lower the current account balance;
    - Aging speed (expected sign: positive): countries in which the population is getting old more rapidly should save more and thereby have a larger current account surplus. This variable was introduced by Lane (2010) and popularised by Lane and Milesi-Ferretti (2012) and is measured as the 20-year forward-looking change in the old-age dependency ratio. For earlier years we use the actual future change (e.g. for 1980 we use the actual change from 1980 to 2000), while for more recent years we use the United Nations 2012 population projection (eg for 2005 we use expected change from 2005 to 2025, where the 2025 data is from the UN projection).
- Oil rents as a percent of GDP (expected sign: positive): various indicators have been used in the literature to isolate the impact of oil prices, production, consumption and trade on current account balances. We use oil rents (percent of GDP), which is influenced by oil price swings, as large oil rents typically lead increased exports which are not matched by corresponding imports.
- Net foreign assets as a percent of GDP (expected sign: positive): if the steady-state NFA/GDP ratio is stable, in a growing economy a positive NFA position must be accompanied by a positive current account balance. The NFA/GDP ratio is lagged (eg the end-2011 value is used for the 2012-15 time period), as the NFA is determined by the past current account balances (and valuation changes) and it provides an initial condition for future current account balance.
- Terms of trade (expected sign: positive): a change in world market prices of a country's exports relative to its imports is expected to improve the current account balance.
- Institutional quality (expected sign: positive): weak institutions lower the risk-adjusted return on investment and thereby lead to lower capital inflows and consequently lower current account balances. We proxy institutional quality with the index of 'Legal system and property rights' from the Economic Freedom Network, which is among the few indicators available for a sufficiently long period for a large number of countries.
- Financial development (expected sign: ambiguous): low level of financial development might indicate an inefficient domestic financial system, which might encourage savers to invest abroad, and thereby a low level of financial development might coincide with a current account surplus. However, low level of financial development could also indicate the presence of credit constraints, which lowers private savings and thereby the current account surplus. We use two possible indicators:
    - The private credit/GDP ratio as a proxy for financial development, which is the standard indicator used in the literature. It is imperfect, as it captures only one aspect of financial development and might also signal the presence of credit booms.
    - The Financial Development Index (and some of its components) by Sahay *et al* (2009), which is available only for 1980-2013 (and there are some missing data for some countries for certain years).

- Various dummy variables: some papers, such as Lane and Milesi-Ferretti (2012), use various dummy variables: a crisis dummy to capture whether a country is experiencing a major economic crisis; an Asian crisis dummy to capture the specific disruptions of the countries concerned during the 1997/98 Asian crisis; a dummy for financial centre to control for the possible measurement errors in the current account of centres of international wholesale asset trade; and a dummy for Norway which is interacted with net oil export to capture the country-specific institutional arrangements that govern the management of Norway's oil revenues. However, we concluded that the determination of many of these dummy variables are questionable, while some of these dummy variables did not prove to be statistically significant in Lane and Milesi-Ferretti (2012) estimates. Furthermore, relative GDP growth is included in our study, which can capture crisis situations. Therefore, we do not include any dummy variable in our estimates.

After selecting the appropriate model, we will use the estimated model to calculate the fitted current account values, which may correspond to a medium-term current account 'equilibrium' or 'norm'. However, there are two issues suggesting that one should assess such fitted values with caution.

First, our models might be imperfect and miss important variables – in which case the fitted value might not correspond to an equilibrium notion. Yet as we will see, the estimated gap between the actual and fitted current account has a strong predicting power for future changes in the current account and for most countries the actual current account balance fluctuates around the fitted value, which can be consistent with an equilibrium notion. However, for a few countries like Australia or the United States, there are persistent gaps between the actual and fitted values, suggesting that certain information for such countries is missing from the model.

Second, we use the actual values of the explanatory variables to calculate fitted values for the current account, but the actual explanatory variables do not always correspond to medium-term sustainable values, even though we use time-averaged data over four-year non-overlapping periods to eliminate fluctuations related to the business cycle. For example, the actual fiscal position over a four-year period may not correspond to a medium-term sustainable position.

The fitted values from our estimated models should be therefore assessed with caution, yet the above-mentioned strong predictability result and the fluctuation of actual current account balances around the predicted values for most countries suggests that our models have useful informational content.

## 3.Data

In terms of the country-sample, we largely follow Lane and Milesi-Ferretti (2012), who considered 67 countries, yet in their final regression 65 countries were used. Very small countries and main oil producers are excluded, though Russia and Norway are included in their sample. From these 67 countries we had to disregard Taiwan, because several variables were not available, but added Malta to have all 28 European Union countries in our sample. One variable is missing for Belarus, the index of legal system and property rights, and therefore Belarus is not included in our models using this variable. Thus our models include 67 or 66 countries, depending on the use of index of legal system and property rights.

The time period we consider is 1972-2015, which we divide into eleven 4-year long non-overlapping time periods. 2015 data are from IMF's April 2015 World Economic Outlook (WEO, for those variables which are included in this dataset). Our data sources are the following:

- Current account balance: the primary source is the IMF WEO; pre-1980 values and some missing values were added from the IMF International Financial Statistics, World Bank World Development Indicators and European Commission's AMECO database.
- Fiscal balance: the primary source is the IMF WEO; pre-1980 values and some missing values were added from Mauro *et al* (2013), European Commission's AMECO database and the EBRD's Selected Economic Indicators database.
- GDP growth: the primary source is the IMF WEO; pre-1980 values and some missing values were added from World Bank World Development Indicators, European Commission's AMECO database, EBRD's Selected Economic Indicators database and Maddison Project.
- GDP per capita at PPP: the primary source is the IMF WEO; pre-1980 values and some missing values were chained backwards using data from World Bank World Development Indicators, European Commission's AMECO database, EBRD's Selected Economic Indicators database and the Maddison Project.
- Young-age dependency ratio: World Bank World Development Indicators.
- Old-age dependency ratio: World Bank World Development Indicators.
- Population growth: World Bank World Development Indicators.
- Aging speed (20-year forward-looking change in the old age dependency ratio): calculated using data on old-age dependency ratio and United Nation's population projections (United Nations, Department of Economic and Social Affairs, Population Division (2013). World Population Prospects: The 2012 Revision, DVD Edition.)
- Oil rents (percent of GDP): World Bank World Development Indicators. Since the most recent data point is 2013 and there were major oil prices changes since then, we approximated 2014-2015 values by assuming that oil rents as a share of GDP evolved proportionally with the evolution of oil prices.
- Net foreign assets: the updated dataset of Lane and Milesi-Ferretti (2007).
- Terms of trade: World Bank World Development Indicators and European Commission's AMECO database.
- Index of 'Legal system and property rights': Economic Freedom Network.
- Private credit/GDP ratio: World Bank World Development Indicators.

## 4.Medium-term determinants of current account balances: regression results

We start by replicating the two main models of Lane and Milesi-Ferretti (2012) in our extended sample period, with the significant difference that we do not include any dummy variable. Table 1 shows remarkable similarity between our and Lane and Milesi-Ferretti's results. Both the estimated values of the parameters and their significance are similar for the fiscal balance, growth differential, GDP per capita, lagged NFA and the measure of oil[1]. For aging speed, our parameter estimate is highly significant, while it was more insignificant in Lane and Milesi-Ferretti (2012). Our parameter estimate for the dependency ratio is only marginally significant (11 percent and 9 percent in the two models, respectively), while it was significant in Lane and Milesi-Ferretti (2012). There are only two variables for which the estimated sign of the parameter is not correct in our sample: population growth and the terms of trade. The R2 of the regression is slightly lower in our estimation, which may be explained by our disregard of the various dummy variables that Lane and Milesi-Ferretti (2012) used,

[1] Lane and Milesi-Ferretti (2012) use 'net oil balance (% of GDP)', but we could not identify a data source for this variable and hence we use 'oil rents (% of GDP)', which is available in the World Bank's World Development Indicators.

in addition to the differences in the sample, such as the time period (1969-2008 versus 1972-2015) and country coverage (65 versus 67).

**Table 1: Medium term determinants of the current account balance: replicating the Lane and Milesi-Ferretti (2012) models on our sample**

| | Model without terms of trade | | Model with terms of trade | |
|---|---|---|---|---|
| | Lane and Milesi-Ferretti (2012) | This paper | Lane and Milesi-Ferretti (2012) | This paper |
| Fiscal balance (+) | 0.243*** | 0.180*** | 0.244*** | 0.184*** |
| | (0.06) | (0.051) | (0.06) | (0.051) |
| Growth differential (-) | −0.072 | -0.098 | −0.08 | -0.097 |
| | (0.09) | (0.083) | (0.09) | (0.082) |
| GDP per capita (+) | 0.027* | 0.045*** | 0.028* | 0.044*** |
| | (0.01) | (0.011) | (0.02) | (0.011) |
| Population growth (-) | −0.74 | 0.147 | −0.75 | 0.147 |
| | (0.47) | (0.281) | (0.48) | (0.281) |
| Old dependency ratio (-) | −0.15** | -0.080 | −0.16** | -0.083* |
| | (0.06) | (0.05) | (0.07) | (0.05) |
| Aging speed (+) | 0.056 | 0.171*** | 0.046 | 0.176*** |
| | (0.06) | (0.041) | (0.06) | (0.042) |
| Lagged NFA (+) | 0.049*** | 0.025*** | 0.050*** | 0.025*** |
| | (0.01) | (0.008) | (0.01) | (0.008) |
| Oil balance (+) | 0.239*** | | 0.239*** | |
| | (0.06) | | (0.06) | |
| Oil rents (+) | | 0.387*** | | 0.397*** |
| | | (0.08) | | (0.078) |
| Oil balance Norway | 0.14 | | 0.171 | |
| | (0.11) | | (0.13) | |
| Log terms of trade (+) | | | 0.0107 | -1.381* |
| | | | (0.01) | (0.753) |
| Crisis dummy (+) | 0.018** | | 0.018** | |
| | (0.01) | | (0.01) | |
| Financial centre dummy | 0.014 | | 0.013 | |
| | (0.01) | | (0.01) | |
| Asian crisis dummy (+) | 0.037*** | | 0.035** | |
| | (0.01) | | (0.01) | |
| Observations | 503 | 581 | 496 | 581 |
| Time periods | 10 | 11 | 10 | 11 |
| Number of countries | 65 | 67 | 65 | 67 |
| R2 | 0.45 | 0.38 | 0.44 | 0.38 |

*Note: Panel estimation, non-overlapping 4-year averages (except for the lagged NFA, which refers to the last year of the previous 4-year period). The dependent variable is the average current account balance during the 4-year period. The expected sign of the parameter is indicated in brackets after the variable name. The Lane and Milesi-Ferretti (2012) sample include 10 observations between 1969-2008 for 65 countries, while our sample period includes 11 observations between 1972-2015 for 67 countries. *,**, *** denote significance at 10, 5 and 1% levels respectively. OLS estimation with robust standard errors.*

Next, we extended the model with further variables discussed in the previous section: young-age dependency ratio, private credit stock over GDP and the index of legal systems and property rights. Separately, we also added the Financial Development Index of Sahay *et al* (2015), which is available for a shorter sample period. We estimate the model for four different country samples: EU, non-EU, advanced countries, emerging countries (see Appendix A for the list of countries) in order to see whether the parameter estimates are robust across different country samples.

Table 6 in Appendix B reports the detailed result for the full sample period (1972-2015) as well as for the first (1972-1995) and second (1996-2015) part of the sample. The parameter estimates of five variables are rather robust to alteration of the sample both in terms of countries and time: budget balance, GDP per capita, aging speed, lagged net foreign asset positon and oil rents. Three additional variables are estimated to have correctly signed and mostly significant parameter in different samples: growth differential, old age dependency ratio and the index of legal systems and property rights[2].

We could not establish a robust relationship between current account developments and domestic credit/GDP ratio (as a proxy for financial development): the parameter estimate is practically zero (ie -0.001 with a 0.006 standard error) for the full sample, while in sub-samples of different country groups the estimated parameter was significantly negative for EU countries and advanced countries and significantly positive for emerging countries (and non-significant for non-EU countries). The use of the Financial Development Index of Sahay *et al* (2009) also suggests that results are rather different in different country groups. While in the full sample of all countries the parameter estimate is significantly positive, this result is driven entirely by emerging countries. For advanced countries and for EU countries the parameter estimate is close to zero and not significant. Moreover, since the Financial Development Index trends upwards for all countries, it is better to include it relative to trading partners to capture whether financial development of a country in a given year was higher or lower than in its trading partners. When we include the index this way, it was not significant anymore in the full sample of all countries, its significance level dropped to 11 percent in the group of emerging countries, while it continued to be insignificant for EU and advanced countries. Therefore, while we found some evidence for the importance of an indicator capturing financial development for emerging countries, supporting the theory that low level of financial development indicates the presence of credit constraints, which lowers private savings and thereby the current account surplus (a finding similar to Chinn and Prasad, 2003), the estimated parameter is not significant for other country groups. For this reason we did not include an indicator of financial development in our final model specification.

The parameter estimates of population growth and young-age dependency ratio very much depend on the time period and countries included in the sample and led in many cases incorrectly signed and/or insignificant estimates. The parameter estimate of terms of trade became consistently negative (which is an incorrect sign) and significant. We therefore dropped these three variables from the model. Dropping these variables hardly changed the parameter estimate of the other variables, suggesting that multicollinearity is not an issue.

Table 2 reports the regression results for our final model. For the sample of all countries, parameters for six of the eight variables are highly statistically significant with correct signs, while for the other two variables (growth differential and legal systems) the estimated sign is correct, though the standard error is about the same as the parameter value. In some of the country sub-samples the parameter estimate of these two variables is also significant. The few cases with incorrectly estimated parameter signs are the following: growth

[2] The index of legal systems and property rights is not available for Belarus and therefore the number of countries in our sample is reduced from 67 to 66.

differential for the non-EU and advanced countries; the old-age dependency ratio for the EU and advanced countries; and the index of legal systems and property rights for the non-EU sample. When we restricted these parameters to zero, the estimated parameters of other variables hardly changed, suggesting again that multicollinearity is not an issue.

Therefore, our results suggest that higher fiscal balance, higher GDP per capita, faster aging speed, larger net foreign assets, larger oil rents and better legal systems increase the medium-term current account balance, while a higher growth differential and larger old-age dependency ratio reduce it.

The coefficient of determination (R2) suggests that the model fits the best for EU and advanced countries (R2 is around 0.5), somewhat less for the non-EU sample (R2 = 0.41) and less for the emerging country sample (R2 = 0.21). The R2 for the full sample is 0.38, which suggests that the model explain a reasonably large share of the variation in current account balances.

**Table 2: Medium term determinants of the current account balance: our final model estimated for different country samples**

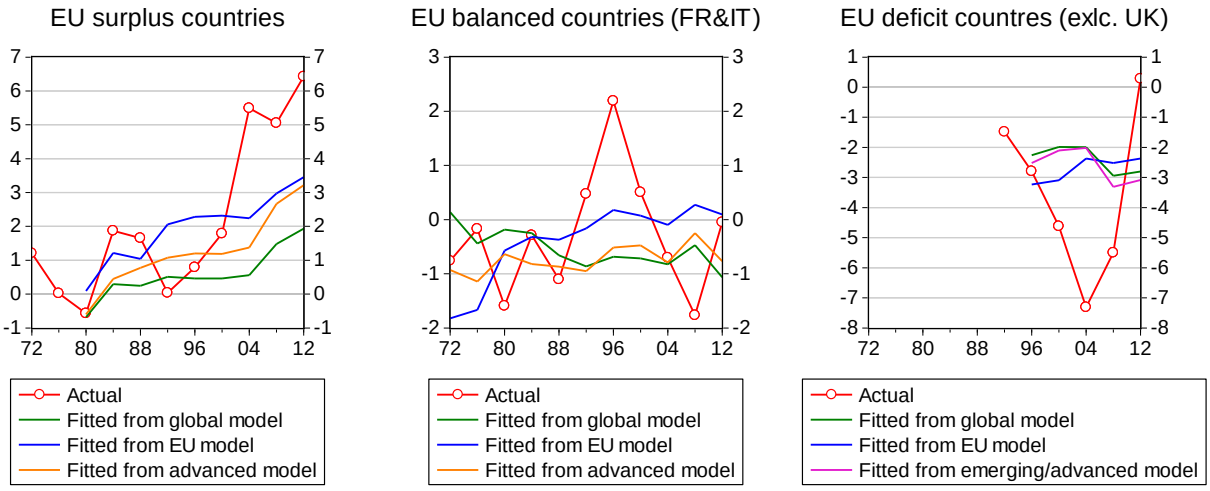
| | All countries | EU | EU restricted | Non-EU | Non-EU restricted | Advanced | Advanced restricted | Emerging |
|---|---|---|---|---|---|---|---|---|
| Fiscal balance (+) | 0.189*** | 0.215*** | 0.225*** | 0.141** | 0.129** | 0.274*** | 0.256*** | 0.011 |
| | (0.05) | (0.077) | (0.076) | (0.063) | (0.063) | (0.07) | (0.074) | (0.07) |
| Growth differential (-) | -0.095 | -0.311** | -0.342** | 0.061 | | 0.164 | | -0.137 |
| | (0.085) | (0.151) | (0.141) | (0.095) | | (0.185) | | (0.092) |
| GDP per capita (+) | 0.041*** | 0.085*** | 0.086*** | 0.033* | 0.033** | 0.077*** | 0.076*** | 0.034* |
| | (0.012) | (0.013) | (0.013) | (0.018) | (0.015) | (0.017) | (0.017) | (0.019) |
| Old dependency ratio (-) | -0.094** | 0.086 | | -0.074 | -0.108 | 0.157*** | | -0.188*** |
| | (0.044) | (0.071) | | (0.07) | (0.069) | (0.052) | | (0.061) |
| Aging speed (+) | 0.16*** | 0.151*** | 0.172*** | 0.172*** | 0.179*** | 0.142** | 0.178*** | 0.192*** |
| | (0.042) | (0.05) | (0.047) | (0.065) | (0.062) | (0.056) | (0.052) | (0.059) |
| Lagged NFA (+) | 0.025*** | 0.007 | 0.006 | 0.03** | 0.03*** | 0.022** | 0.02** | 0.022*** |
| | (0.008) | (0.007) | (0.008) | (0.012) | (0.012) | (0.009) | (0.009) | (0.007) |
| Oil rents (+) | 0.387*** | 0.355 | 0.398 | 0.393*** | 0.414*** | 0.006 | 0.056 | 0.415*** |
| | (0.081) | (0.302) | (0.304) | (0.093) | (0.09) | (0.146) | (0.15) | (0.106) |
| Legal system (+) | 0.113 | 0.719*** | 0.726*** | -0.107 | | 0.37* | 0.423** | 0.164 |
| | (0.154) | (0.235) | (0.233) | (0.209) | | (0.214) | (0.215) | (0.228) |
| Observations | 570 | 224 | 224 | 346 | 355 | 277 | 277 | 293 |
| Time periods | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Number of countries | 66 | 28 | 28 | 38 | 39 | 28 | 28 | 38 |
| R2 | 0.38 | 0.50 | 0.50 | 0.41 | 0.41 | 0.51 | 0.49 | 0.21 |

*Note: Panel estimation, non-overlapping 4-year averages (except for the lagged NFA, which refers to the last year of the previous 4-year period) between 1972-2015. The dependent variable is the average current account balance during the 4-year period. The expected sign of the parameter is indicated in brackets after the variable name.*,**, *** denote significance at 10, 5 and 1% levels respectively. OLS estimation with robust standard errors.*

## 5.Fitted current account balances

We use the estimated models reported in the previous section to calculate the fitted current account values, which might correspond to the medium-term current account 'equilibrium' or 'norm' keeping in mind the caveats discussed in Section 2. Each country is included in three country groups for which we estimated our model in Table 2: the global sample, either EU or non-EU sample, and either the advanced country or the emerging country sample. While Table 2 reports the quantitative differences between the estimated parameters along these country-group samples, a plot of the fitted values is helpful for assessing the differences across the models estimated for different country samples. Appendix C presents the charts for all 66 countries included in our sample, while below we highlight the results for three EU aggregate country groups and for a few specific countries inside and outside the EU.

**Figure 2: Actual and fitted current account balance (% GDP), 1972-2015: EU country groups**



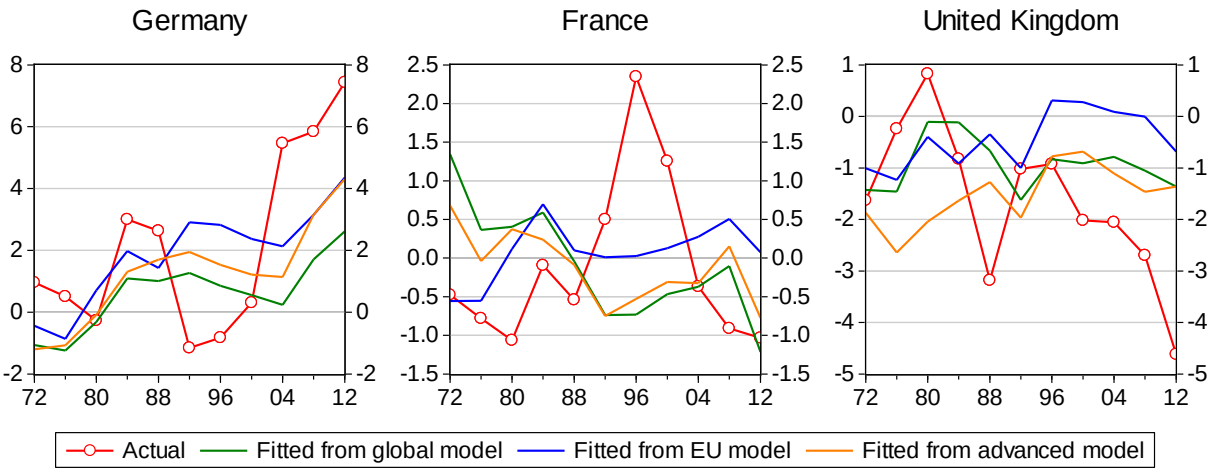

*Note: Fitted values are derived from the estimation results (restricted versions) reported in Table 2. The sample period includes 4-year non-overlapping periods (e.g. the last observation refers to 2012-15). EU surplus (7): Austria, Belgium, Denmark, Finland, Germany, Netherlands and Sweden. EU balanced (2): France and Italy. EU deficit (16): Bulgaria, Czech Republic, Cyprus, Estonia, Greece, Hungary, Ireland, Latvia, Lithonia, Malta, Poland, Portugal, Romania, Slovakia, Slovenia and Spain. Luxembourg and Croatia are not included in the aggregates due to their shorter time series, while we left out the United Kingdom because its deficit developments very much differed from other deficit countries. We use the average current account balance in 2000-2007 to separate surplus (larger than 1% of GDP), balanced (between 1% and -1% of GDP) and deficit (below -1% of GDP) countries. See the notes to Figure 1.*

In order to highlight the general developments in EU surplus, balanced and deficit countries (as we classified these countries for Figure 1), we calculated aggregates for the three groups (Figure 2). There are some differences between the three fitted values from the three models (in particular, the EU model tends to indicate somewhat larger fitted values), but the dynamics are quite similar. For the 'surplus countries', the actual current account fluctuated around the model estimates in 1980-2003, but since then large excess surpluses emerged (note that our sample period includes 4-year averages and therefore we can only highlight the start of that 4-year period when a major change is observed). The actual position of the two 'balanced countries' (France and Italy) was quite similar to model predictions, except in the 1990s, when both countries recorded excess surplus according to our estimates, and in 2008-11, when they had a small excess deficit. In EU 'deficit countries' (not including the United Kingdom, which is shown separately in Figure 3), there were large

excessive deficits in 2000-2011, which were then rapidly corrected. On average, these countries have not an excess surplus relative to model predictions of about 3 percent of GDP.

Let us assess the developments in some specific countries, which also allows considering longer time periods.

**Figure 3: Actual and fitted current account balance (% GDP), 1972-2015: the three largest EU countries**




*Note: Fitted values are derived from the estimation results (restricted versions) reported in Table 2. The sample period includes 4-year non-overlapping periods (e.g. the last observation refers to 2012-15).*

Figure 3 reports the results for the three largest EU countries. For Germany, the actual current account fluctuated around the fitted values in 1972-2003, but a persistent and large positive gap emerged in 2004-15. In the latest time period, 2012-15, the 'excess' surplus of Germany was about 5 percent of GDP according to the global model and about 3 percent according to the EU and advanced country models. Interestingly, the fitted values for Germany also increased recent years.

Table 3 decomposes the change in the fitted value between 2004-07 and 2012-15. For Germany, the three main contributors are:

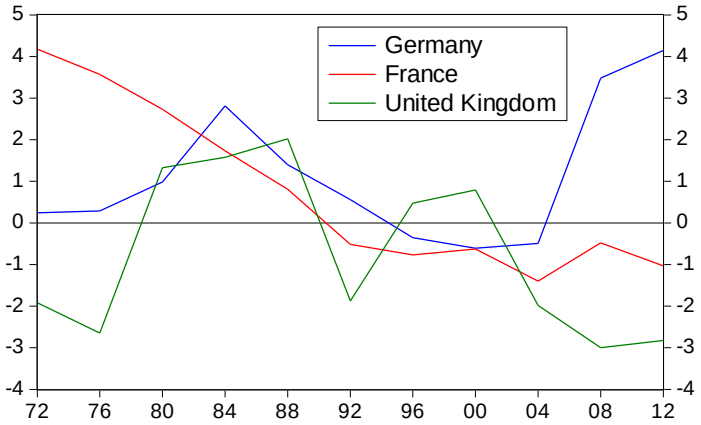
a. The relative fiscal balance (explaining 0.9 percentage point of GDP) increase: Figure 4 shows that while Germany's fiscal position relative to its trading partners was close to zero in 2004-07, its position in 2012-15 is about 4 percent of GDP higher. Whether this improved relative fiscal position corresponds to long-term sustainability is an open question. Yet as trading partners will most likely improve their fiscal position in coming years, while it is not expected from Germany, Germany's relative fiscal position will likely decline and thereby reduce its estimated medium-term current account equilibrium in the coming years;
b. Demographic factors (explaining 1.0 percentage point of GDP increase): the higher share of old-age people implies a 0.3 percent of GDP lower current account balance, while the rapid aging process implies a 1.3 percent higher balance;
c. The increased net foreign asset position (explaining 0.5 percentage point of GDP increase): since Germany's NFA position improved, more net income is expected, which increases the current account balance.

**Table 3: Contributions to the change in fitted current account values from 2004-07 to 2012-15 using the global model (% GDP)**

| | | Germany | France | United Kingdom |
|---|---|---|---|---|
| (1) | Fitted value 2004-2007 | 0.2 | -0.4 | -0.8 |
| (2) | Fitted value 2012-2015 | 2.6 | -1.2 | -1.4 |
| (3)=(2)-(1) | Change in fitted value | 2.4 | -0.8 | -0.6 |
| (3.1) | *Contribution of Fiscal balance* | *0.9* | *0.1* | *-0.2* |
| (3.2) | *Contribution of Growth differential* | *-0.1* | *0.0* | *-0.1* |
| (3.3) | *Contribution of GDP per capita* | *0.2* | *-0.1* | *-0.1* |
| (3.4) | *Contribution of Old dependency ratio* | *-0.3* | *-0.3* | *-0.3* |
| (3.5) | *Contribution of Aging speed* | *1.3* | *0.3* | *0.4* |
| (3.6) | *Contribution of Lagged NFA* | *0.5* | *-0.8* | *-0.1* |
| (3.7) | *Contribution of Oil rents* | *0.0* | *0.0* | *-0.1* |
| (3.8) | *Contribution of Legal system* | *-0.1* | *0.0* | *0.0* |
| (4) | Actual value 2004-2007 | 5.5 | -0.4 | -2.1 |
| (5) | Actual value 2012-2015 | 7.4 | -1.0 | -4.6 |
| (6)=(4)-(1) | Gap 2004-2007 | 5.2 | 0.0 | -1.3 |
| (7)=(5)-(2) | Gap 2012-2015 | 4.8 | 0.2 | -3.3 |

*Note: the estimated model reported in the first column of Table 2 is used. The contribution of each factor the change in the fitted value is the product of the estimated parameter and the change in the variable from 2004-07 to 2012-15. The same decomposition for all countries is reported in Appendix D.*

**Figure 4: The relative fiscal balance (% GDP), 1972-2015**

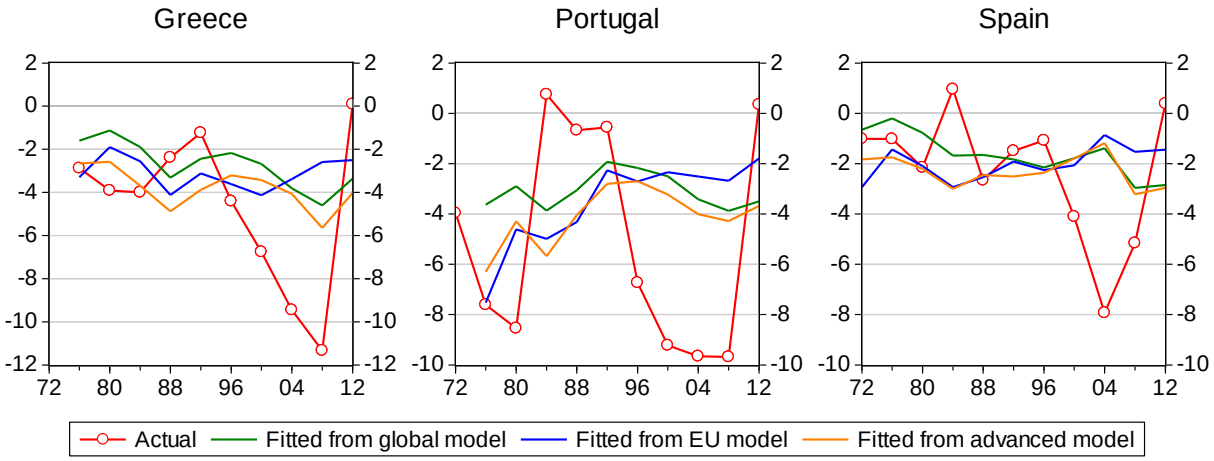



*Note: The sample period includes 4-year non-overlapping periods (e.g. the last observation refers to 2012-15).*

France had relatively small actual deficits and surpluses in the past four decades and our estimates reported in Figure 3 suggest that it had an 'excess surplus' in 1992-2003, which corrected in later years. In the latest time period, 2012-15, France's current account balance was fully in line with the prediction of the global model, while it had a small (about 1 percent of GDP) 'excess' deficit according to the EU model. The change in the fitted value from 2004-07 to 2012-15 is entirely due to a worsened NFA position, as all other factors cancel out.

The actual balance of the United Kingdom fluctuated around the fitted values from 1972-1999, after which a persistent negative gap emerged. In 2000-07 this gap was rather small (around 1-2 percent of GDP depending on which estimated model we consider), but more recently the gap widened and by 2012-15 our models suggest a 3-4 percent of GDP negative gap.

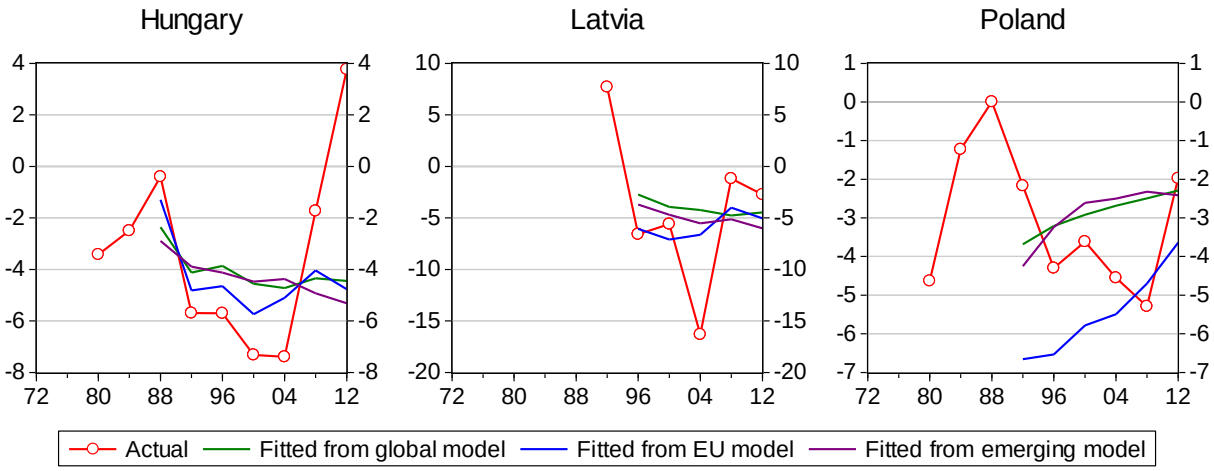
**Figure 5: Actual and fitted current account balance (% GDP), 1972-2015: three euro-area deficit countries**




*Note: Fitted values are derived from the estimation results (restricted versions) reported in Table 2. The sample period includes 4-year non-overlapping periods (e.g. the last observation refers to 2012-15).*

The results for three euro-area deficit countries reported in Figure 5 show remarkable similarity: before the mid-1990s (in the cases of Greece and Portugal) or late 1990s (in the case of Spain), the actual current account balance fluctuated around the values predicted by the model. Since then, up to the global financial and economic crisis, large excessive current account deficits emerged, which adjusted quite abruptly, pushing the current account to a small surplus, well over the values predicted by the models.

**Figure 6: Actual and fitted current account balance (% GDP), 1972-2015: three central European countries**

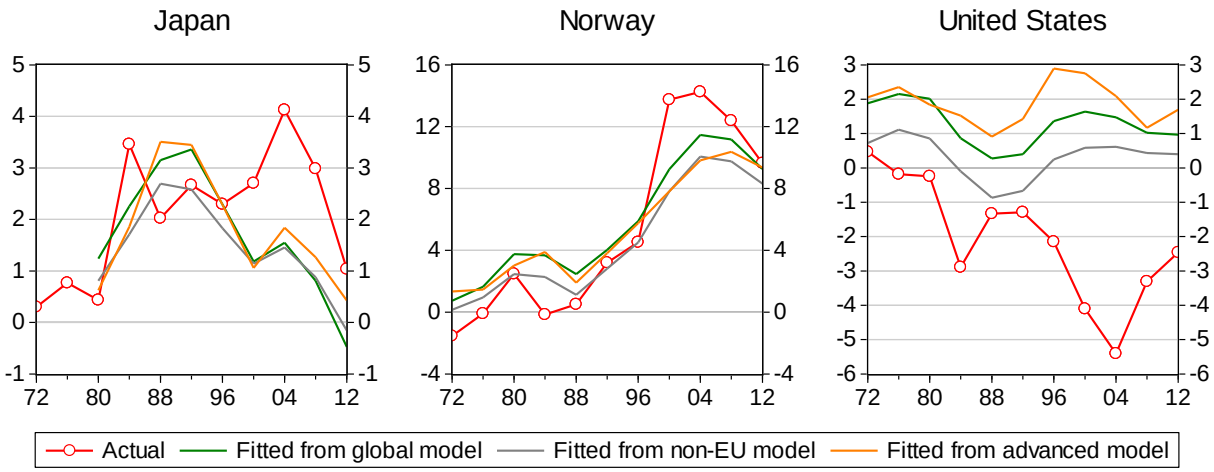



*Note: Fitted values are derived from the estimation results (restricted versions) reported in Table 2. The sample period includes 4-year non-overlapping periods (e.g. the last observation refers to 2012-15).*

Central European member states that joined the EU in 2004 show similar patterns to the three euro-area deficit countries discussed above (Figure 6). In the run-up to the crisis, current accounts recorded larger deficits that what were predicted by the models, while the most recent observations indicate positive gaps relative to the model predictions. It is noteworthy that while for Hungary and Latvia the three models predict broadly similar values, in the case of Poland the EU model predicts much larger current account deficits than the predictions of the global and emerging country models.

We now turn to the assessment of the results for some non-EU countries.

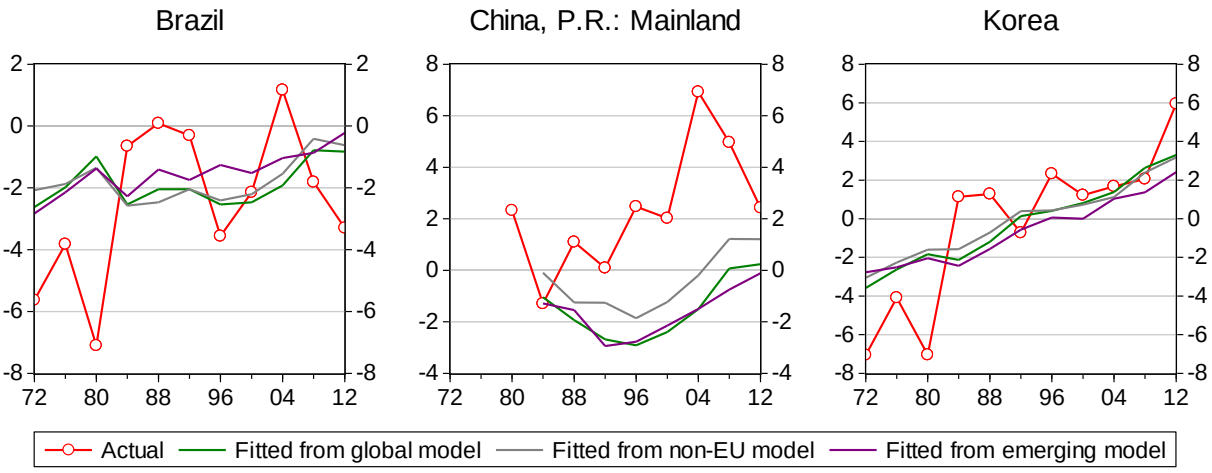
**Figure 7: Actual and fitted current account balance (% GDP), 1972-2015: three non-EU advanced countries**




*Note: Fitted values are derived from the estimation results (restricted versions) reported in Table 2. The sample period includes 4-year non-overlapping periods (e.g. the last observation refers to 2012-15).*

Japan's surplus was quite well in line with model predictions in 1980-99. After that, an excess surplus emerged, which started to decline more recently, along with a decline in the fitted values. The results for Norway are also interesting and suggest that the actual current account was more or less in line with model predictions in 1972-99 and more recently in 2012-15, while in between the surplus was larger than what was predicted by the models. It is noteworthy that the model predictions suggest a secular increase in Norway's surplus from the 1970s onwards. The United States is an outlier in the sense that the current account balance has always been worse than what was predicted by the model. Most likely, the global role of the US dollar and specific characteristics of US foreign assets and liabilities make it possible for the US to run a current account deficit larger than what is predicted by a model estimated on a large number of countries[3].

**Figure 8: Actual and fitted current account balance (% GDP), 1972-2015: three non-EU emerging countries**




*Note: Fitted values are derived from the estimation results (restricted versions) reported in Table 2. The sample period includes 4-year non-overlapping periods (e.g. the last observation refers to 2012-15).*

Finally, Figure 8 shows our results for three main emerging economies. The actual current account balance of Brazil fluctuated around the values predicted by our models, but China had large surpluses well in excess of model predictions. More recently, the Chinese surplus has declined, while the fitted value moved upwards (largely due to the rapid aging process, and to a lesser extent due to improved fiscal position, increase in GDP per capita and increased NFA – see Appendix D), thereby reducing the estimated excess surplus of the country. Our results for Korea underline a secular increase in fitted values according to all three models, while the actual current account fluctuated around the model predictions. The 1997 Asian crisis was followed by a moderate excess surplus (about 1.5-2 percent of GDP on average in 1996-99), while in the next 12 years the actual current account was well in line with model predictions. More recently, however, Korea's current account

[3] Gourinchas and Rey (2007) found for the United States that the cost of servicing its liabilities (which to a large extent comprise fixed income assets, partly reflecting the dominant role of the US dollar in the international monetary system) is much lower than the return on US investment abroad (which typically takes the form of various equity-type investments). Therefore, they have named the US the 'World Venture Capitalist'.

surplus increased to 6 percent of GDP, though our models predicted a smaller increase (largely due to the aging process and to a lesser extent improved fiscal position and increase GDP per capita).

## 6.Error correction

If the fitted values from our model correspond to an 'equilibrium' current account balance, then we expect the actual current account to head for the predicted values. Therefore, whenever there is an excess surplus, then either the actual surplus is expected to decline towards the predicted surplus, or the predicted surplus is expected to increase towards the actual surplus (or both). A simple test of the first chain of events is to estimate a regression in which the change in the actual current account surplus is regressed on the previous period gap between the actual and the predicted surplus, similar to an error correction model:

$$(2) \qquad \Delta CA_{i,t} = \alpha + \beta \cdot CAGAP_{i,t-1} + \varepsilon_{i,t} ,$$

where $\Delta CA_{i,t}$ is the change in the current account balance (% of GDP) of country *i* in period *t*, $CAGAP_{i,t-1} = CA_{i,t-1} - \hat{CA}_{i,t-1}$ is the previous period gap between the actual values of country *i* and the fitted values (% GDP), and $\varepsilon_{i,t}$ is the error term. A negative parameter for $\beta$ would suggest that excessive imbalances are corrected. Lane and Milesi-Ferretti (2012, 2014) estimated a variant of this regression concerning the change in the current account balance from 2005-2008 either to 2010 or to 2012, using the current account gaps estimated in Lane and Milesi-Ferretti (2012) for 2005-2008[4]. They estimated a significantly negative value for $\beta$.

We estimated equation (2) for our full panel sample as well as for each time period as a cross section regression. The results are reported in Table 4. The first block of the table shows the results for our full panel sample. The estimated $\beta$ is significantly negative for all country groups. The parameter estimate of -0.33 for the sample that includes all countries indicate that one-third of excess current account surpluses and deficits are corrected on average from one four-year period to the next, during our 40-year long sample period[5]. The parameter estimates are somewhat higher in absolute terms for the EU (-0.55) and the emerging country (-0.45), suggesting a stronger correction of current account gaps, while it is slightly lower for the advanced country group (-0.25). The results clearly indicate that our estimated current account gaps matter for the future development of the actual current account, which is reassuring.

The remaining ten blocks of the table report cross section results for each 4-year period. For example, the second block of the table under the heading '1976-79' reports the result of the regression of the change in the current account balance from 1972-75 to 1976-79 as a function of the 1972-75 current account gap. The parameter estimates are predominantly negative: there are only 6 of the 50 estimates (10 time periods x 5 country groups) which lead to a positive estimated parameter. Four of these 6 positive parameters are from the pre-crisis period of 2004-07, suggesting that in the run-up to the crisis, instead of a correction of existing current account imbalances, they have widened. This must have led to wider current account imbalances by the crisis, which may explain why in the subsequent two periods, 2008-11 and 2012-15, the parameter

[4] Milesi-Ferretti (2012, 2014) include other variables in the regression, like the lagged NFA position and a dummy for countries having fixed exchange rate regime.

[5] Note that our full sample includes eleven 4-year long periods between 1972-2015, but since we use the lagged value of the current account gap, the effective sample period is reduced by one and thereby includes ten 4-year long periods between 1976-2015.

estimates turn significantly negative again, while the absolute value of parameter estimates are among the largest in these two periods. It is also worthwhile that the R2 of this regression dropped close to zero in 2004-07, suggesting that even though imbalances were amplified in this period according to parameter estimates, existing imbalances explained very little of the variability of current account changes. However, in the 2008-11 period, this simple regression explains about one half of the variability, suggesting that the correction of imbalances during the crisis played a major role in current account changes.

**Table 4: Error correction regression results: symmetric specification of equation (2)**

| | | All | EU | non-EU | Advanced | Emerging |
|---|---|---|---|---|---|---|
| 1972-2015 | β | -0.33*** | -0.55*** | -0.31*** | -0.25*** | -0.45*** |
| Full panel sample | s.e. | (0.05) | (0.09) | (0.06) | (0.06) | (0.07) |
| | Nobs | 504 | 196 | 308 | 249 | 255 |
| | R2 | 0.14 | 0.23 | 0.13 | 0.08 | 0.20 |
| 1976-79 | β | -0.50*** | -0.43 | -0.45*** | -0.59*** | -0.21 |
| cross section | s.e. | (0.07) | (0.32) | (0.09) | (0.06) | (0.15) |
| | Nobs | 27 | 11 | 16 | 18 | 9 |
| | R2 | 0.47 | 0.21 | 0.45 | 0.63 | 0.08 |
| 1980-83 | β | -0.26* | -0.2 | -0.39** | -0.1 | -0.57** |
| cross section | s.e. | (0.13) | (0.21) | (0.18) | (0.18) | (0.2) |
| | Nobs | 33 | 13 | 20 | 20 | 13 |
| | R2 | 0.09 | 0.09 | 0.15 | 0.02 | 0.22 |
| 1984-87 | β | -0.58*** | -1.16** | -0.61*** | -0.57** | -0.42** |
| cross section | s.e. | (0.13) | (0.4) | (0.17) | (0.24) | (0.17) |
| | Nobs | 41 | 14 | 27 | 24 | 17 |
| | R2 | 0.27 | 0.44 | 0.29 | 0.20 | 0.24 |
| 1988-91 | β | -0.43*** | -0.3 | -0.49*** | -0.32** | -0.33 |
| cross section | s.e. | (0.13) | (0.25) | (0.15) | (0.14) | (0.26) |
| | Nobs | 43 | 14 | 29 | 25 | 18 |
| | R2 | 0.20 | 0.14 | 0.22 | 0.15 | 0.10 |
| 1992-95 | β | -0.18 | -0.25 | 0.01 | -0.17 | -0.13 |
| cross section | s.e. | (0.16) | (0.2) | (0.21) | (0.18) | (0.15) |
| | Nobs | 48 | 15 | 33 | 25 | 23 |
| | R2 | 0.03 | 0.07 | 0.00 | 0.03 | 0.03 |
| 1996-99 | β | -0.21 | -0.41 | -0.33 | 0.06 | -0.75** |
| cross section | s.e. | (0.20) | (0.25) | (0.29) | (0.13) | (0.32) |
| | Nobs | 53 | 19 | 34 | 26 | 27 |
| | R2 | 0.04 | 0.12 | 0.11 | 0.00 | 0.28 |
| 2000-04 | β | -0.10 | -0.28* | -0.16 | -0.18 | -0.03 |
| cross section | s.e. | (0.09) | (0.16) | (0.14) | (0.13) | (0.15) |
| | Nobs | 62 | 26 | 36 | 27 | 35 |
| | R2 | 0.02 | 0.13 | 0.03 | 0.05 | 0.00 |
| 2004-07 | β | 0.23** | -0.27 | 0.13 | 0.48** | 0.01 |
| cross section | s.e. | (0.11) | (0.22) | (0.19) | (0.19) | (0.15) |
| | Nobs | 65 | 28 | 37 | 28 | 37 |
| | R2 | 0.06 | 0.04 | 0.02 | 0.23 | 0.00 |
| 2008-11 | β | -0.47*** | -0.67*** | -0.33*** | -0.30*** | -0.67*** |
| cross section | s.e. | (0.09) | (0.20) | (0.07) | (0.06) | (0.16) |
| | Nobs | 66 | 28 | 38 | 28 | 38 |
| | R2 | 0.48 | 0.41 | 0.41 | 0.45 | 0.55 |
| 2012-15 | β | -0.54*** | -0.58*** | -0.46** | -0.56** | -0.45** |
| cross section | s.e. | (0.13) | (0.17) | (0.19) | (0.21) | (0.18) |
| | Nobs | 66 | 28 | 38 | 28 | 38 |
| | R2 | 0.25 | 0.27 | 0.25 | 0.21 | 0.20 |

*Note: The first block reports result for the full panel sample, while the next 10 blocks show cross-section results for each 4-year long time period. *,**, *** denote significance at 10, 5 and 1% levels respectively. OLS estimation with robust standard errors.*

The results reported in Table 4 based on equation (2) assumed that the impacts of excess surpluses and deficits are identical. Is this a correct assumption? In order to answer this question, we allow the estimated parameter to differ whether there was an excess deficit or an excess surplus in the previous period:

$$(3) \qquad \Delta CA_{i,t} = \begin{cases} \alpha_1 + \beta_1 \cdot CAGAP_{i,t-1} + \varepsilon_{i,t} & if\ CAGAP_{i,t-1} < 0 \\ \alpha_2 + \beta_2 \cdot CAGAP_{i,t-1} + \varepsilon_{i,t} & if\ CAGAP_{i,t-1} \geq 0 \end{cases}.$$

The results reported in Table 5 suggest that there is a major asymmetry: excess deficits are more forcefully corrected than excess surpluses. Considering the full panel sample reported in the first block of the table, the parameter estimates of excess deficit is highly significant in all country groups, while the parameter estimates for excess surpluses are only marginally significant. The absolute values of the estimated parameters are also much large in the case of excess deficits. The cross-section results for the ten time periods reported in the table also reveal that there are more cases with negative parameter estimates in the case of excess deficits, and these parameters are more often significant than in the case of excess surpluses.

Similarly to the symmetric case reported in Table 4, Table 5 also suggests that there some 'error amplification' in the pre-crisis period of 2004-07 (though parameter estimates are not significant), while during and after the crisis, in 2008-11 and 2012-15, there were large and statistically significant 'error correction' effects as regards excess deficits. The parameter estimates for excess surpluses are correctly signed in 2008-11 and 2012-15, but statistically significant only in the cases of non-EU and emerging countries in 2012-15. Therefore, our results show that there was no statistically significant error correction in EU surplus countries.

**Table 5: Error correction regression results: asymmetric specification of equation (3)**

| | | All | EU | non-EU | Advanced | Emerging |
|---|---|---|---|---|---|---|
| 1972-2015 | β1 | -0.62*** | -0.65*** | -0.60*** | -0.45*** | -0.83*** |
| Full panel sample | s.e. | (0.10) | (0.19) | (0.11) | (0.12) | (0.15) |
| | β2 | -0.15 | -0.09 | -0.21* | -0.05 | -0.28** |
| | s.e. | (0.09) | (0.14) | (0.12) | (0.11) | (0.14) |
| | Nobs | 504 | 196 | 308 | 249 | 255 |
| | R2 | 0.17 | 0.25 | 0.16 | 0.11 | 0.24 |
| 1976-79 | β1 | -0.59*** | 1.18 | -0.62*** | -0.67*** | -0.47 |
| cross section | s.e. | (0.10) | (0.75) | (0.09) | (0.07) | (0.66) |
| | β2 | -1.02** | -0.52 | -0.9*** | -0.53 | -0.07 |
| | s.e. | (0.45) | (0.30) | (0.11) | (0.32) | (0.76) |
| | Nobs | 27 | 11 | 16 | 18 | 9 |
| | R2 | 0.53 | 0.40 | 0.76 | 0.64 | 0.12 |
| 1980-83 | β1 | 0.04 | -0.20 | -0.07 | 0.24 | -0.89 |
| cross section | s.e. | (0.22) | (0.34) | (0.50) | (0.16) | (0.87) |
| | β2 | -0.13 | -0.70*** | 0.38* | -0.20 | 0.52 |
| | s.e. | (0.44) | (0.20) | (0.21) | (0.58) | (0.37) |
| | Nobs | 33 | 13 | 20 | 20 | 13 |
| | R2 | 0.13 | 0.33 | 0.29 | 0.11 | 0.31 |
| 1984-87 | β1 | -0.68*** | -1.38** | -0.67*** | -0.86*** | -0.34 |
| cross section | s.e. | (0.18) | (0.62) | (0.21) | (0.21) | (0.30) |
| | β2 | -0.79** | 1.88*** | 1.22 | 0.13 | -1.07 |
| | s.e. | (0.35) | (0.00) | (1.39) | (0.92) | (0.64) |
| | Nobs | 41 | 14 | 27 | 24 | 17 |
| | R2 | 0.29 | 0.49 | 0.31 | 0.27 | 0.25 |
| 1988-91 | β1 | -0.72* | -0.88* | -0.25 | -0.46 | -0.70 |
| cross section | s.e. | (0.40) | (0.40) | (0.67) | (0.42) | (0.75) |
| | β2 | -0.01 | -0.08 | 0.04 | 0.09 | -0.19 |
| | s.e. | (0.18) | (0.29) | (0.26) | (0.13) | (0.20) |
| | Nobs | 43 | 14 | 29 | 25 | 18 |
| | R2 | 0.24 | 0.22 | 0.29 | 0.23 | 0.13 |
| 1992-95 | β1 | -0.54 | -0.41*** | -0.07 | -0.21 | -0.02 |
| cross section | s.e. | (0.40) | (0.07) | (0.60) | (0.31) | (1.01) |
| | β2 | 0.67* | 1.72** | 0.05 | 0.75 | -0.38 |
| | s.e. | (0.39) | (0.64) | (0.58) | (0.69) | (0.35) |
| | Nobs | 48 | 15 | 33 | 25 | 23 |
| | R2 | 0.14 | 0.68 | 0.00 | 0.29 | 0.05 |
| 1996-99 | β1 | -0.65 | -0.30 | -0.63 | 0.12 | -1.56*** |
| cross section | s.e. | (0.58) | (0.76) | (0.59) | (0.15) | (0.53) |
| | β2 | 0.25 | -0.28 | 0.29 | -0.03 | -0.5 |
| | s.e. | (0.27) | (0.27) | (0.33) | (0.42) | (0.6) |
| | Nobs | 53 | 19 | 34 | 26 | 27 |
| | R2 | 0.11 | 0.13 | 0.21 | 0.01 | 0.39 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2000-04 | β1 | -0.18 | -0.41 | -1.12 | 0.33 | -0.30 |
| cross section | s.e. | (0.26) | (0.37) | (0.80) | (0.77) | (0.29) |
| | β2 | -0.08 | 0.16 | -0.24 | -0.08 | 0.08 |
| | s.e. | (0.16) | (0.35) | (0.18) | (0.16) | (0.41) |
| | Nobs | 62 | 26 | 36 | 27 | 35 |
| | R2 | 0.02 | 0.18 | 0.08 | 0.09 | 0.02 |
| 2004-07 | β1 | 0.01 | 0.50 | 0.18 | 0.08 | -0.25 |
| cross section | s.e. | (0.36) | (0.43) | (0.49) | (0.47) | (0.67) |
| | β2 | -0.18 | 0.14 | -0.14 | 0.09 | 0.08 |
| | s.e. | (0.19) | (0.72) | (0.26) | (0.37) | (0.3) |
| | Nobs | 65 | 28 | 37 | 28 | 37 |
| | R2 | 0.16 | 0.14 | 0.09 | 0.31 | 0.01 |
| 2008-11 | β1 | -0.67*** | -0.80** | -0.41*** | -0.43*** | -1.12*** |
| cross section | s.e. | (0.20) | (0.34) | (0.08) | (0.09) | (0.28) |
| | β2 | -0.12 | -0.11 | -0.07 | -0.16 | -0.04 |
| | s.e. | (0.12) | (0.33) | (0.14) | (0.19) | (0.18) |
| | Nobs | 66 | 28 | 38 | 28 | 38 |
| | R2 | 0.54 | 0.43 | 0.49 | 0.48 | 0.69 |
| 2012-15 | β1 | -0.86*** | -0.64** | -0.89* | -1.40*** | -0.23 |
| cross section | s.e. | (0.28) | (0.27) | (0.47) | (0.47) | (0.28) |
| | β2 | -0.47 | -0.46 | -0.58* | -0.40 | -0.81*** |
| | s.e. | (0.32) | (0.38) | (0.29) | (0.43) | (0.26) |
| | Nobs | 66 | 28 | 38 | 28 | 38 |
| | R2 | 0.28 | 0.27 | 0.32 | 0.36 | 0.24 |

*Note: The first block reports result for the full panel sample, while the next 10 blocks show cross-section results for each 4-year long time period. *,**, *** denote significance at 10, 5 and 1% levels respectively. OLS estimation with robust standard errors.*

## 7.Conclusions

From the mid-1990s to the global economic and financial crisis, global current account imbalances widened significantly, while there has been a major correction since then. The adjustment of European current account deficits has been in line with global developments (though they were more forceful), but European current account surpluses defied global trends and continued to increase to over 7 percent of GDP. Thus, from a broadly balanced current account position before the global crisis the EU became a major contributor to global current account imbalances.

In order to assess various explanations for the EU's increased surplus, we use a standard panel econometric model to analyse the determinants of medium-term current account balances. We estimate the model for 66 countries during eleven 4-year long non-overlapping periods from 1972-2015, and study the model's robustness in different time periods and country samples. We consider several variables studied in previous literature and confirm that higher fiscal balance, higher GDP per capita, more rapidly aging populations, larger net foreign assets, larger oil rents and better legal systems increase the medium-term current account balance, while a larger growth differential and a higher old-age dependency ratio reduce it. We could not establish a robust relationship between current account developments and the terms of trade, domestic credit/GDP ratio (as a proxy for financial development), the financial development index of the IMF, population growth and the young-age dependency ratio.

We found that in the first eight 4-year long periods of our sample, 1972-2003, the actual balance of European surplus countries fluctuated around the predictions of our model, but in the latest three 4-year periods, 2004-15, large positive gaps emerged. While worsening demographic developments, improved fiscal positions and increased net foreign assets explain some of the increase in European current account surpluses, they became excessive according to our estimation results considering all variants of our model. Current account deficits in several EU countries were highly excessive before the crisis according to our results and were forcefully corrected. Most previous EU deficit countries display an excess surplus now.

The gap between the actual current account balance and its fitted value in the model has a strong predictive power for future current account developments in a panel specification that treats surpluses and deficits symmetrically. An asymmetric model which allows different correction of excess surpluses and deficits suggests that the adjustment of excess deficits is more forceful than the adjustment of excess surpluses. Cross-section estimates for individual 4-year long periods suggests that the 2004-07 period was special in the past four decades, because excess imbalances were amplified during this period, though such amplification explained a small fraction of the variance of current account changes. In 2008-15, a forceful correction followed, when the adjustment of earlier excess imbalances explained a large share of the variation of current account balance changes, except for EU surplus countries.

Our key conclusion considering various versions of our models is that European current account surpluses became excessive in the past twelve years as neither their level nor their dynamics can be justified by standard panel econometric models. Such results raise important policy questions and support the conclusions of the European Commission (2015) and the IMF (2015) in their assessment of the current account surplus of Germany, the country with the largest surplus in the EU. Decisive policy actions, such as bold structural reforms and demand management, are needed to alleviate the problem of excessive current account balances, as discussed by Darvas and Wolff (2014).

## References


Cheung, Calista, Davide Fucieri and Elena Rusticelli (2013) 'Structural and cyclical factors behind current account balances', Review of International Economics 21(5), 923–944

Chinn, Menzie D. and Eswar Prasad (2003) 'Medium-term determinants of current accounts in industrial and developing countries', Journal of International Economics 59, 47–76

Chinn, Menzie D. and Hiro Ito (2007) 'Current account balances, financial development and institutions: Assaying the world "saving glut"', Journal of International Money and Finance 26(4), 546–569

Chinn, Menzie D., Barry Eichengreen and Hiro Ito (2014) 'A forensic analysis of global imbalances', Oxford Economic Papers 66(2), 465–490

Darvas, Zsolt and Guntram B. Wolff (2014), 'To the Commissioner for Economic and Monetary Affairs', In: Sapir, André (ed.): Memos to the new EU leadership – EU to do in 2015-2019, Bruegel, p. 22-34, http://www.bruegel.org/publications/publication-detail/publication/845-eu-to-do-2015-2019-memos-to-the-new-eu-leadership/

European Commission (2015) 'Macroeconomic imbalances Country Report – Germany 2015', European Economy, Occasional Papers 214, http://ec.europa.eu/economy_finance/publications/occasional_paper/2015/pdf/ocp214_en.pdf

Gagnon, Joseph (2011) 'Current account imbalances coming back', Working Paper 11-1, Peterson Institute for International Economics

Gourinchas, Pierre-Olivier and Hélène Rey (2007) 'From world banker to world venture capitalist: US external adjustment and the exorbitant privilege', in: Richard H. Clarida (ed.) 'G7 current account imbalances: sustainability and adjustment', National Bureau of Economic Research Conference Report, Chicago: University of Chicago Press, 11–66

Gruber, Joseph W. and Steven B. Kamin (2007) 'Explaining the global pattern of current account imbalances', Journal of International Money and Finance 26(4), 500–522

IMF (2015) '2015 External sector report – Individual country assessments', http://www.imf.org/external/np/pp/eng/2015/062615a.pdf

Lane, Philip R. (2010) 'International financial integration and Japanese economic performance', In: Kashyap, Anil, Hamada, Koichi, Weinstein, David (Eds.), Japan's bubble, deflation and long-term stagnation, MIT Press, 129–174

Lane, Philip R. and Gian Maria Milesi-Ferretti (2007) 'The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004', Journal of International Economics 73(2), 223–250

Lane, Philip R. and Gian Maria Milesi-Ferretti (2012) 'External adjustment and the global crisis', Journal of International Economics 88, 252–265

Lane, Philip R. and Gian Maria Milesi-Ferretti (2014) 'Global imbalances and external adjustment after the crisis', Working Paper 14/151, International Monetary Fund

Mauro, Paolo, Rafael Romeu, Ariel Binder and Asad Zaman (2013) 'A modern history of fiscal prudence and profligacy', Working Paper No. 13/5, International Monetary Fund

Sahay, Ratna, Martin Cihak, Papa N'Diaye, Adolfo Barajas, Diana Ayala Pena, Ran Bi, Yuan Gao, Annette Kyobe, Lam Nguyen, Christian Saborowski, Katsiaryna Svirydzenka and Reza Yousefi (2015): 'Rethinking Financial Deepening : Stability and Growth in Emerging Markets Rethinking Financial Deepening: Stability and Growth in Emerging Markets', Staff Discussion Notes No. 15/8, International Monetary Fund

## Appendix A: List of countries included in our sample

| | EU | Non-EU | Advanced | Emerging | Surplus | Balance | Deficit | | | EU | Non-EU | Advanced | Emerging | Surplus | Balance | Deficit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Argentina | | x | | x | x | | | | Latvia | x | | | x | | | x |
| Australia | | x | x | | | | x | | Lithuania | x | | | x | | | x |
| Austria | x | | x | | x | | | | Luxembourg | x | | x | | x | | |
| Belgium | x | | x | | x | | | | Malaysia | | x | | x | x | | |
| Brazil | | x | | x | | x | | | Matla | x | | x | | | | x |
| Bulgaria | x | | | x | | | x | | Mexico | | x | | x | | | x |
| Canada | | x | x | | x | | | | Morocco | | x | | x | x | | |
| Chile | | x | | x | x | | | | Netherlands | x | | x | | x | | |
| China, P.R.: Mainland | | x | | x | x | | | | New Zealand | | x | x | | | | x |
| China,P.R.: Hong Kong | | x | x | | x | | | | Norway | | x | x | | x | | |
| Colombia | | x | | x | | | x | | Pakistan | | x | | x | | x | |
| Costa Rica | | x | | x | | | x | | Peru | | x | | x | | x | |
| Croatia | x | | | x | | | x | | Philippines | | x | | x | x | | |
| Cyprus | x | | x | | | | x | | Poland | x | | | x | | | x |
| Czech Republic | x | | | x | | | x | | Portugal | x | | x | | | | x |
| Denmark | x | | x | | x | | | | Romania | x | | | x | | | x |
| Dominican Republic | | x | | x | | | x | | Russia | | x | | x | x | | |
| El Salvador | | x | | x | | | x | | Serbia | | x | | x | | | x |
| Estonia | x | | | x | | | x | | Singapore | | x | x | | x | | |
| Finland | x | | x | | x | | | | Slovakia | x | | | x | | | x |
| France | x | | x | | | x | | | Slovenia | x | | | x | | | x |
| Germany | x | | x | | x | | | | South Africa | | x | | x | | | x |
| Greece | x | | x | | | | x | | Spain | x | | x | | | | x |
| Guatemala | | x | | x | | | x | | Sri Lanka | | x | | x | | | x |
| Hungary | x | | | x | | | x | | Sweden | x | | x | | x | | |
| Iceland | | x | x | | | | x | | Switzerland | | x | x | | x | | |
| India | | x | | x | | x | | | Thailand | | x | | x | x | | |
| Indonesia | | x | | x | x | | | | Tunisia | | x | | x | | | x |
| Ireland | x | | x | | | | x | | Turkey | | x | | x | | | x |
| Israel | | x | x | | x | | | | Ukraine | | x | | x | x | | |
| Italy | x | | x | | | x | | | United Kingdom | x | | x | | | | x |
| Japan | | x | x | | x | | | | United States | | x | x | | | | x |
| Korea | | x | | x | x | | | | Uruguay | | x | | x | | x | |

*Note: we use the average current account balance in 2000-2007 to separate surplus (larger than 1% of GDP), balanced (between 1% and -1% of GDP) and deficit (below -1% of GDP) countries. See the notes to Figure 1.*

## Appendix B: Estimation results for the broad model

**Table 6: Medium term determinants of the current account balance: the broad model estimated for different country samples**

| A: full sample 1972-2015 | All countries | All countr. restricted | EU | EU restricted | Non-EU | Non-EU restricted | Advanced | Advanced restricted | Emerging | Emerging restricted |
|---|---|---|---|---|---|---|---|---|---|---|
| Fiscal balance (+) | 0.201*** | 0.194*** | 0.257*** | 0.236*** | 0.147** | 0.083 | 0.277*** | 0.242*** | -0.003 | |
| | (0.052) | (0.052) | (0.072) | (0.076) | (0.068) | (0.071) | (0.07) | (0.065) | (0.071) | |
| Growth differential (-) | -0.087 | -0.104 | -0.268* | -0.375** | 0.027 | | 0.127 | | -0.111 | -0.244*** |
| | (0.088) | (0.087) | (0.155) | (0.149) | (0.095) | | (0.194) | | (0.093) | (0.084) |
| GDP per capita (+) | 0.04*** | 0.04*** | 0.118*** | 0.111*** | 0.027 | 0.03* | 0.089*** | 0.087*** | 0.051** | 0.025 |
| | (0.013) | (0.013) | (0.014) | (0.015) | (0.018) | (0.016) | (0.017) | (0.016) | (0.021) | (0.019) |
| Population growth (-) | -0.021 | | -1.112** | -0.594 | 0.356 | | -0.248 | -0.539 | 0.088 | -0.225 |
| | (0.422) | | (0.494) | (0.458) | (0.601) | | (0.646) | (0.468) | (0.568) | (0.544) |
| Young depend. ratio (-) | 0.021 | | 0.195*** | | -0.06* | -0.05** | 0.066 | | -0.059* | -0.055** |
| | (0.029) | | (0.049) | | (0.034) | (0.024) | (0.066) | | (0.031) | (0.024) |
| Old dependency ratio (-) | -0.073 | -0.096** | 0.15** | | -0.123* | -0.179** | 0.186*** | | -0.23** | -0.261*** |
| | (0.051) | (0.045) | (0.07) | | (0.071) | (0.077) | (0.066) | | (0.091) | (0.09) |
| Aging speed (+) | 0.196*** | 0.168*** | 0.363*** | 0.243*** | 0.088 | 0.097 | 0.291*** | 0.276*** | -0.038 | |
| | (0.062) | (0.051) | (0.062) | (0.05) | (0.098) | (0.096) | (0.072) | (0.065) | (0.09) | |
| Lagged NFA (+) | 0.025*** | 0.025*** | 0.002 | 0.004 | 0.028** | 0.029** | 0.021** | 0.02** | 0.02*** | 0.025*** |
| | (0.008) | (0.008) | (0.007) | (0.007) | (0.012) | (0.012) | (0.009) | (0.008) | (0.007) | (0.007) |
| Oil rents (+) | 0.403*** | 0.389*** | 0.474 | 0.457 | 0.408*** | 0.44*** | -0.052 | | 0.447*** | 0.311*** |
| | (0.084) | (0.084) | (0.307) | (0.311) | (0.088) | (0.09) | (0.164) | | (0.091) | (0.096) |
| Log terms of trade (+) | -1.481* | | -2.053 | | -1.922** | | 0.759 | 0.978 | -3.084*** | |
| | (0.797) | | (2.209) | | (0.8) | | (1.456) | (1.275) | (0.98) | |
| Legal system (+) | 0.175 | 0.162 | 0.829*** | 0.831*** | -0.361* | | 0.622*** | 0.515** | -0.333 | |
| | (0.167) | (0.157) | (0.222) | (0.236) | (0.215) | | (0.23) | (0.211) | (0.222) | |
| Private credit (+/-) | -0.001 | -0.001 | -0.017*** | -0.018*** | 0.009 | 0.007 | -0.02** | -0.02*** | 0.031*** | 0.026*** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.011) | (0.01) | (0.008) | (0.007) | (0.009) | (0.008) |
| Observations | 561 | 561 | 222 | 222 | 339 | 348 | 270 | 274 | 291 | 326 |
| Time periods | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Number of countries | 66 | 66 | 28 | 28 | 38 | 39 | 28 | 28 | 38 | 39 |
| R2 | 0.37 | 0.37 | 0.57 | 0.54 | 0.41 | 0.39 | 0.53 | 0.52 | 0.30 | 0.23 |

**B: 1st part of the sample 1972-1995**

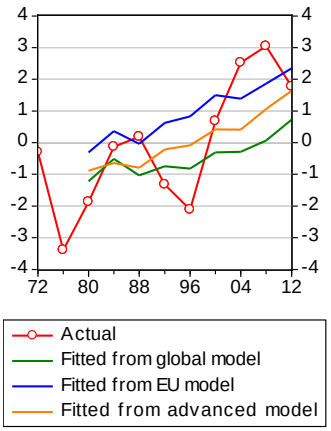
| | All countries | All countr. restricted | EU | EU restricted | Non-EU | Non-EU restricted | Advanced | Advanced restricted | Emerging | Emerging restricted |
|---|---|---|---|---|---|---|---|---|---|---|
| Fiscal balance (+) | 0.125* | 0.115* | 0.042 | 0.04 | 0.213** | 0.179* | 0.101 | 0.085 | -0.089 | |
| | (0.064) | (0.063) | (0.087) | (0.085) | (0.096) | (0.099) | (0.075) | (0.07) | (0.109) | |
| Growth differential (-) | -0.092 | -0.117 | 0.049 | | -0.098 | -0.151 | 0.021 | -0.034 | -0.031 | -0.18* |
| | (0.091) | (0.094) | (0.196) | | (0.105) | (0.11) | (0.209) | (0.216) | (0.107) | (0.093) |
| GDP per capita (+) | 0.015 | 0.014 | 0.063** | 0.061** | 0.01 | 0.008 | 0.05*** | 0.046*** | 0.037 | 0.026 |
| | (0.013) | (0.012) | (0.025) | (0.025) | (0.02) | (0.009) | (0.018) | (0.016) | (0.026) | (0.025) |
| Population growth (-) | -0.102 | -0.149 | -1.584** | -1.512*** | 0.472 | | 0.314 | | -1.184 | -1.031 |
| | (0.701) | (0.649) | (0.647) | (0.563) | (0.928) | | (0.84) | | (1.069) | (0.661) |
| Young depend. ratio (-) | -0.006 | -0.009 | -0.028 | -0.031 | -0.007 | | -0.128 | -0.138*** | 0.021 | |
| | (0.038) | (0.033) | (0.076) | (0.075) | (0.041) | | (0.078) | (0.044) | (0.049) | |
| Old dependency ratio (-) | 0.039 | | -0.196 | -0.205* | 0.122 | | 0.114 | | -0.122 | -0.128 |
| | (0.081) | | (0.125) | (0.119) | (0.122) | | (0.09) | | (0.143) | (0.139) |
| Aging speed (+) | 0.119* | 0.116** | 0.115 | 0.106 | 0.098 | 0.066 | 0.113 | 0.08 | 0.129 | |
| | (0.066) | (0.058) | (0.137) | (0.134) | (0.092) | (0.076) | (0.081) | (0.065) | (0.256) | |
| Lagged NFA (+) | 0.019*** | 0.02*** | 0.018** | 0.019*** | 0.014* | 0.016* | 0.011 | 0.011 | 0.022*** | 0.023*** |
| | (0.006) | (0.006) | (0.007) | (0.006) | (0.008) | (0.008) | (0.01) | (0.008) | (0.007) | (0.007) |
| Oil rents (+) | 0.141** | 0.158** | 0.346 | 0.331 | 0.143** | 0.167** | -0.029 | | 0.103 | 0.053 |
| | (0.066) | (0.067) | (0.291) | (0.299) | (0.072) | (0.072) | (0.158) | | (0.064) | (0.08) |
| Log terms of trade (+) | -0.595 | | 0.552 | 0.525 | -1.337 | | 0.776 | 0.898 | -2.627** | |
| | (0.915) | | (2.323) | (2.32) | (1.023) | | (1.286) | (1.067) | (1.25) | |
| Legal system (+) | -0.209 | | 0.465 | 0.472 | -0.604*** | | -0.142 | | -0.337 | |
| | (0.179) | | (0.302) | (0.303) | (0.224) | | (0.309) | | (0.265) | |
| Private credit (+/-) | 0.012 | 0.009 | 0.007 | 0.007 | 0.029** | 0.02** | 0.004 | 0.005 | 0.011 | 0.014 |
| | (0.008) | (0.007) | (0.011) | (0.011) | (0.012) | (0.01) | (0.01) | (0.008) | (0.015) | (0.013) |
| Observations | 242 | 248 | 85 | 85 | 157 | 161 | 136 | 142 | 106 | 135 |
| Time periods | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Number of countries | 52 | 52 | 18 | 18 | 34 | 34 | 26 | 26 | 26 | 27 |
| R2 | 0.28 | 0.28 | 0.42 | 0.42 | 0.30 | 0.27 | 0.40 | 0.42 | 0.19 | 0.11 |

## C: 2nd part of the sample 1996-2015

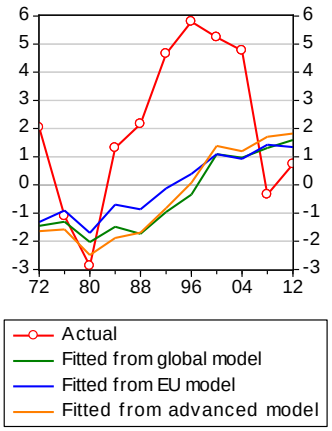
| | All countries | All countr. restricted | EU | EU restricted | Non-EU | Non-EU restricted | Advanced | Advanced restricted | Emerging | Emerging restricted |
|---|---|---|---|---|---|---|---|---|---|---|
| Fiscal balance (+) | 0.233*** | 0.242*** | 0.475*** | 0.448*** | 0.064 | 0.086 | 0.725*** | 0.521*** | -0.002 | |
| | (0.087) | (0.087) | (0.159) | (0.149) | (0.098) | (0.099) | (0.165) | (0.127) | (0.095) | |
| Growth differential (-) | -0.072 | -0.156 | -0.538** | -0.627*** | 0.239 | | -0.053 | | -0.062 | -0.149 |
| | (0.147) | (0.145) | (0.251) | (0.2) | (0.166) | | (0.366) | | (0.154) | (0.124) |
| GDP per capita (+) | 0.064*** | 0.059*** | 0.13*** | 0.12*** | 0.071** | 0.061* | 0.108*** | 0.096*** | 0.076** | 0.037 |
| | (0.02) | (0.019) | (0.022) | (0.018) | (0.035) | (0.032) | (0.023) | (0.022) | (0.03) | (0.025) |
| Population growth (-) | -0.298 | | -1.283** | -1.134* | -0.462 | -0.193 | -2.202** | -1.355* | 0.301 | |
| | (0.554) | | (0.595) | (0.59) | (0.813) | (0.78) | (0.962) | (0.773) | (0.646) | |
| Young depend. ratio (-) | 0.099** | | 0.36*** | | -0.03 | -0.03 | 0.364*** | | 0.015 | |
| | (0.044) | | (0.115) | | (0.052) | (0.04) | (0.107) | | (0.053) | |
| Old dependency ratio (-) | -0.082 | -0.165*** | 0.146 | | -0.257** | -0.266** | 0.168 | | -0.138 | -0.188*** |
| | (0.069) | (0.059) | (0.09) | | (0.104) | (0.104) | (0.11) | | (0.12) | (0.066) |
| Aging speed (+) | 0.196** | 0.093 | 0.385*** | 0.266*** | -0.044 | | 0.27** | 0.173 | -0.033 | |
| | (0.085) | (0.071) | (0.089) | (0.079) | (0.139) | | (0.118) | (0.111) | (0.121) | |
| Lagged NFA (+) | 0.024** | 0.024** | -0.008 | | 0.03* | 0.031* | 0.022** | 0.018* | 0.015 | 0.015 |
| | (0.01) | (0.01) | (0.009) | | (0.017) | (0.016) | (0.01) | (0.01) | (0.012) | (0.012) |
| Oil rents (+) | 0.662*** | 0.551*** | 0.472 | 0.518 | 0.595*** | 0.552*** | -0.428** | | 0.799*** | 0.705*** |
| | (0.119) | (0.111) | (0.586) | (0.614) | (0.128) | (0.132) | (0.205) | | (0.113) | (0.097) |
| Log terms of trade (+) | -3.449** | | -2.457 | | -3.21** | | -0.661 | | -4.642*** | |
| | (1.479) | | (6.389) | | (1.347) | | (4.076) | | (1.34) | |
| Legal system (+) | 0.356 | 0.31 | 0.473 | 0.977*** | -0.117 | 0.071 | -0.141 | 0.22 | -0.122 | |
| | (0.267) | (0.265) | (0.398) | (0.361) | (0.431) | (0.393) | (0.447) | (0.43) | (0.4) | |
| Private credit (+/-) | -0.006 | -0.007 | -0.023*** | -0.021*** | 0.005 | 0 | -0.019 | -0.024** | 0.039*** | 0.036*** |
| | (0.008) | (0.008) | (0.008) | (0.008) | (0.015) | (0.012) | (0.012) | (0.01) | (0.011) | (0.008) |
| Observations | 319 | 319 | 137 | 139 | 182 | 182 | 134 | 134 | 185 | 191 |
| Time periods | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Number of countries | 66 | 66 | 28 | 28 | 38 | 38 | 28 | 28 | 38 | 39 |
| R2 | 0.46 | 0.44 | 0.64 | 0.63 | 0.52 | 0.50 | 0.62 | 0.59 | 0.42 | 0.38 |

## Appendix C: Actual and fitted current accounts for all countries in our sample

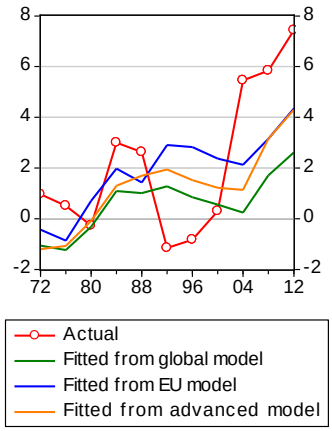
Austria



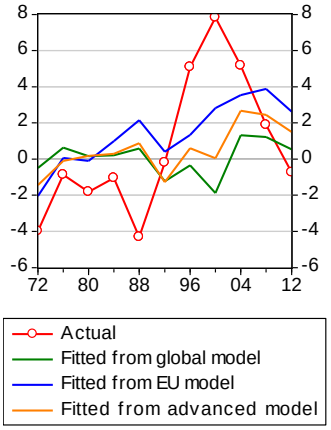

Belgium



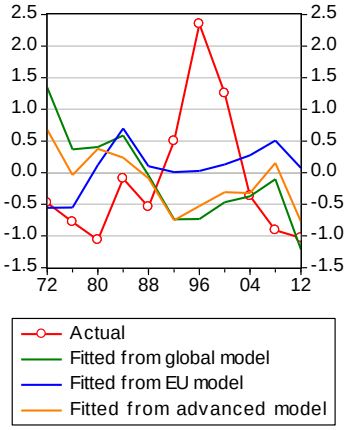

Germany



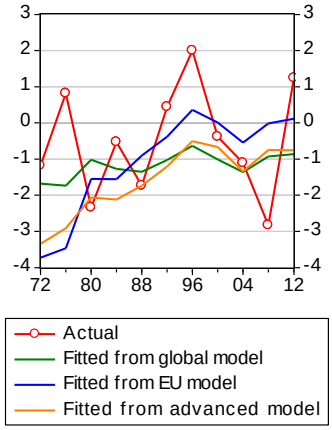

Finland



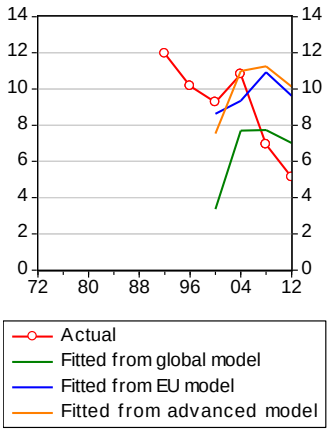

France



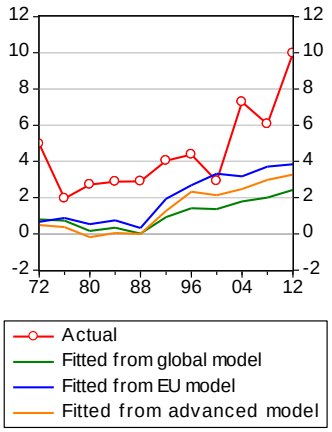

Italy



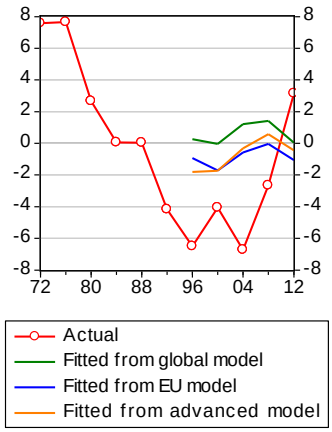

Luxembourg



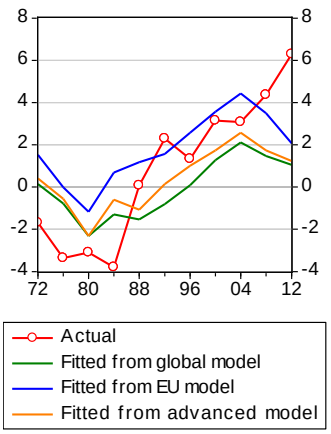

Netherlands



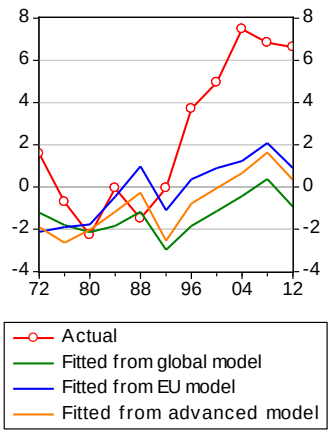

Matla



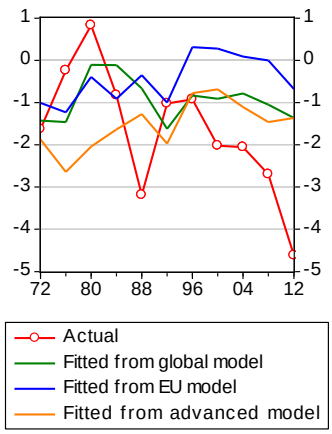

Denmark



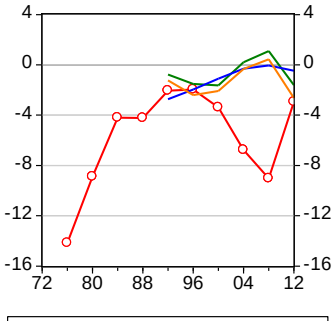

Sweden



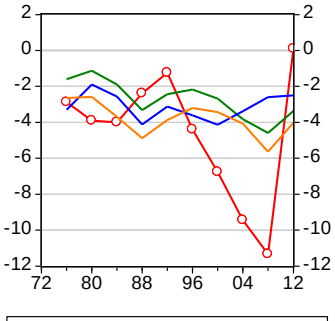

United Kingdom



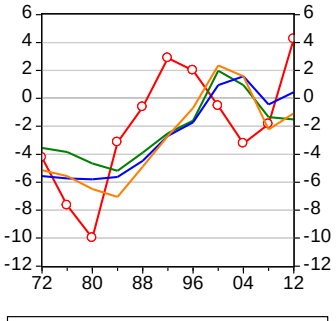
Cyprus



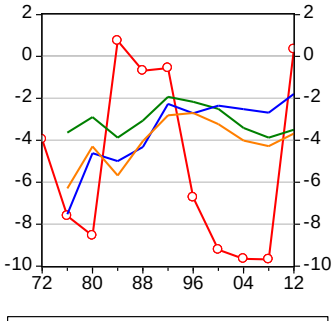

Greece



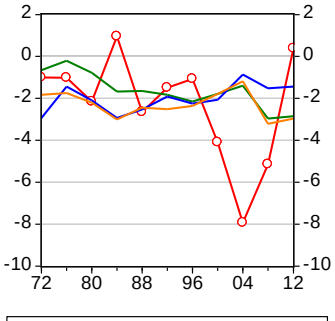

Ireland



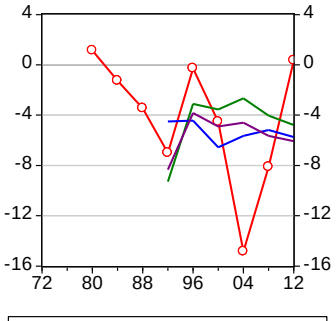

Portugal



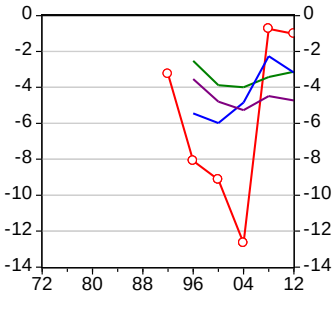

Spain



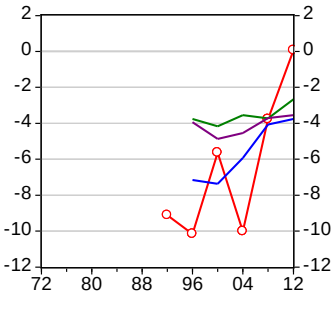

Bulgaria



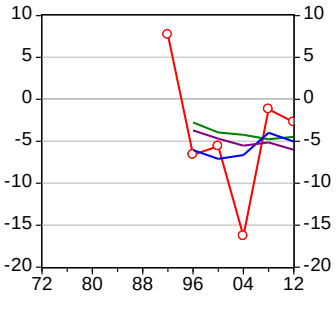

Estonia



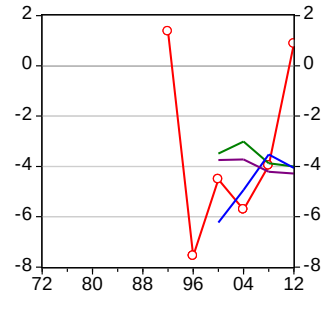

Lithuania



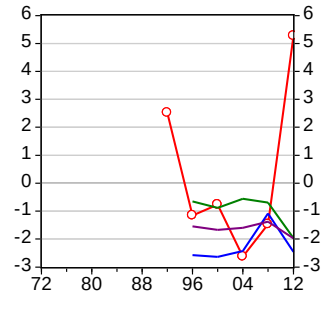

Latvia



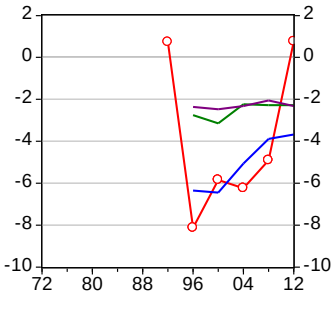

Croatia



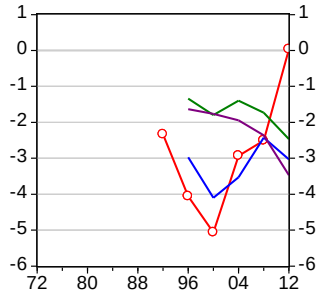

Slovenia



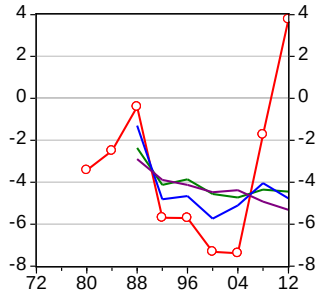

Slovakia



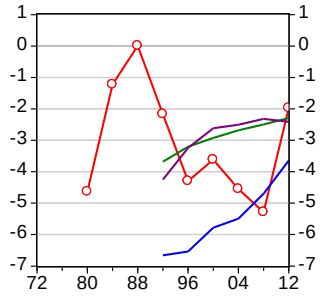
Czech Republic



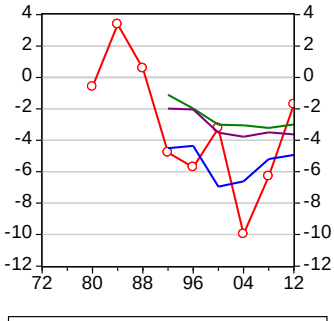

Hungary



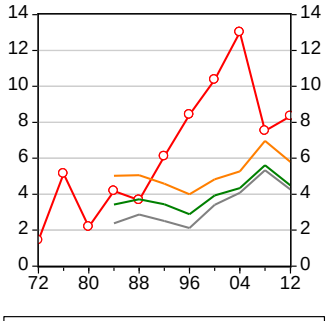

Poland




Romania

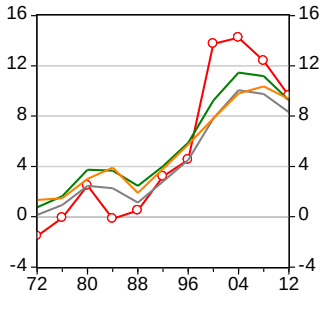



Switzerland

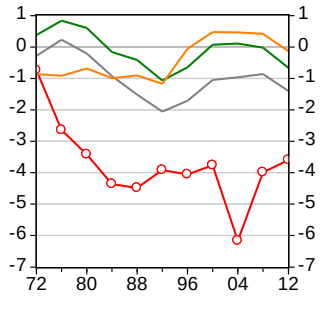



Iceland

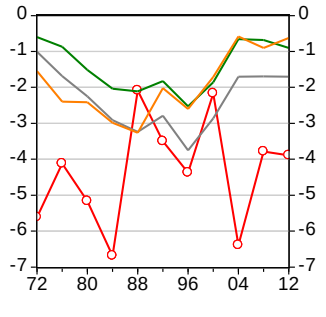

Norway



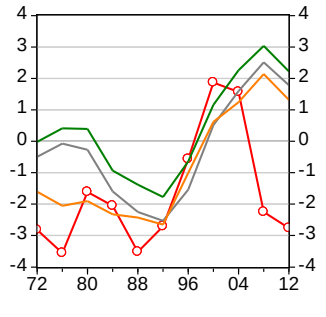

Australia



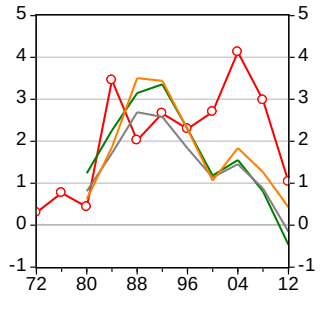

New Zealand



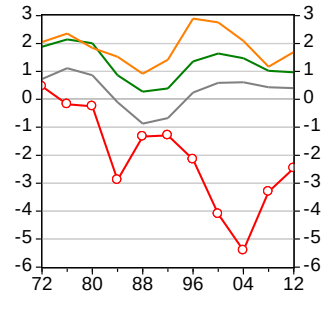

Canada



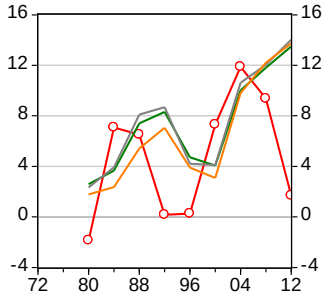

Japan



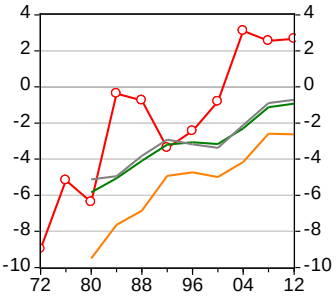

United States



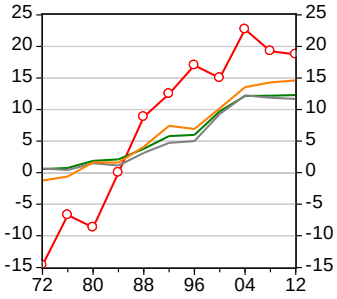
China,P.R.: Hong Kong



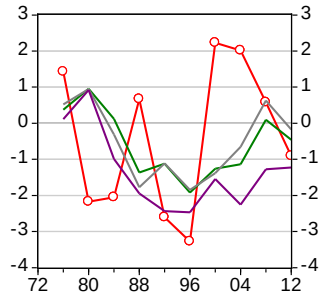

Israel



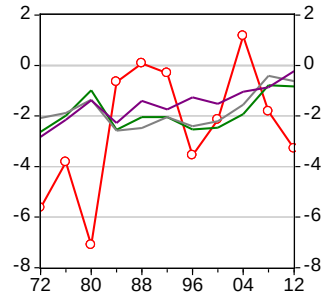

Singapore



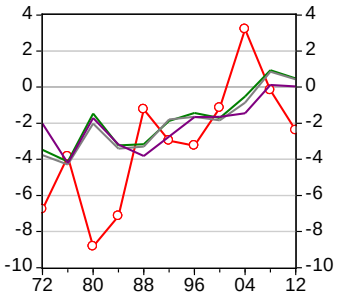

Argentina



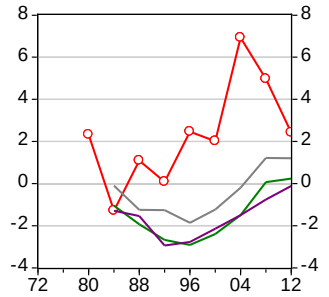

Brazil



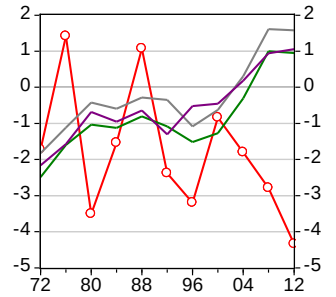

Chile



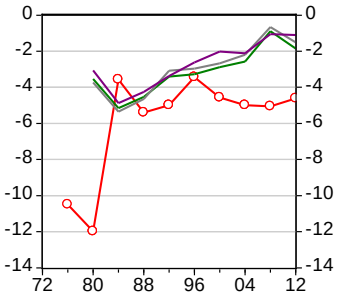

China, P.R.: Mainland



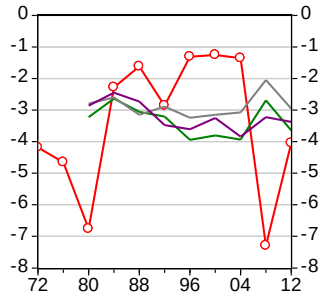

Colombia



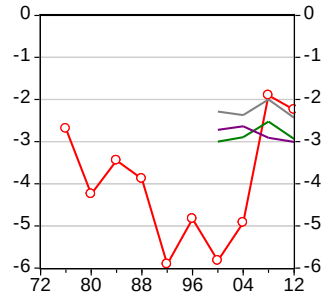

Costa Rica



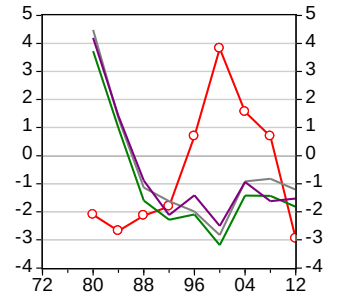

Dominican Republic



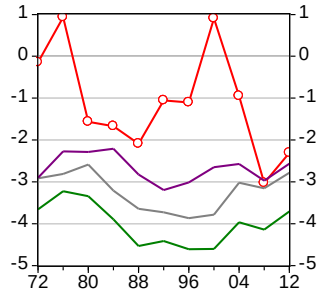

Guatemala

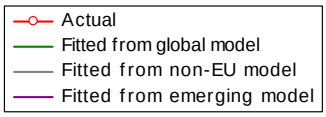



Indonesia

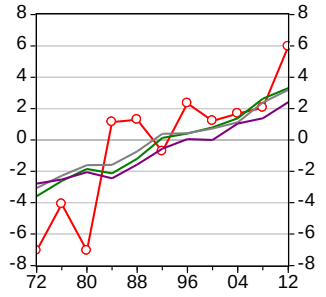


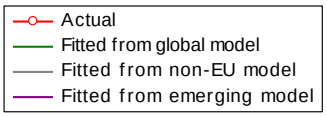
India



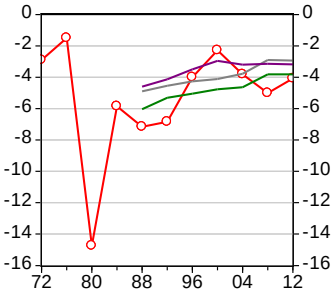



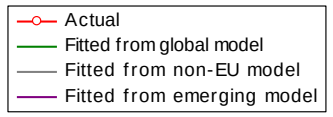

Korea



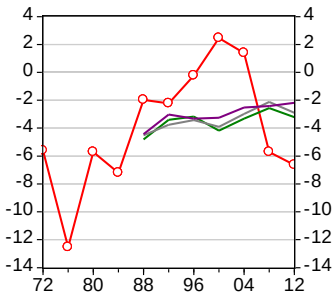



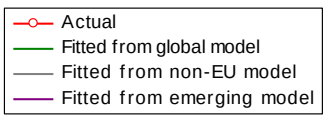

Sri Lanka



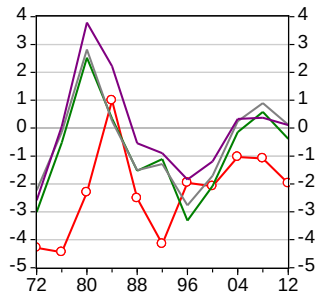



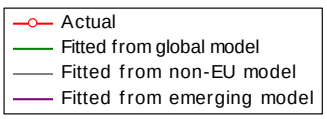

Morocco



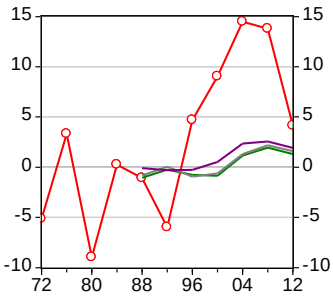



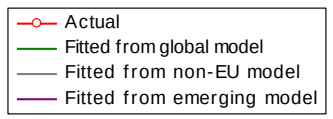

Mexico



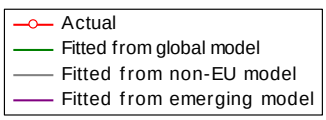




Malaysia

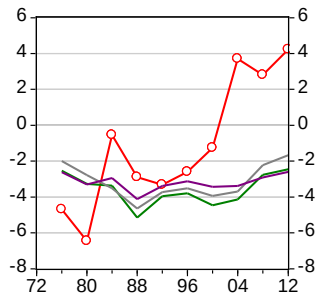


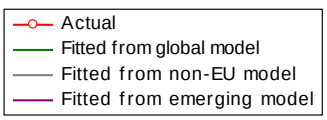




Peru

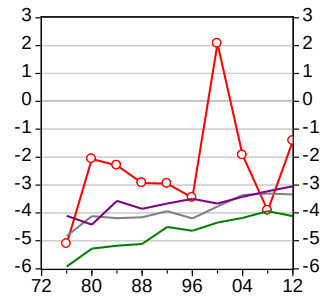



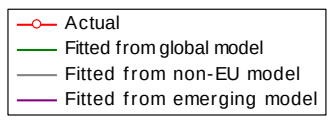

Philippines



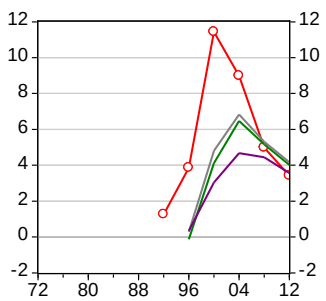



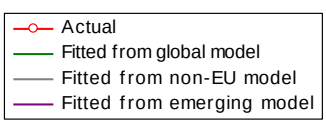

Pakistan



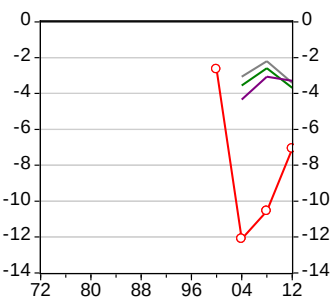



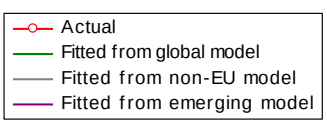

Russia



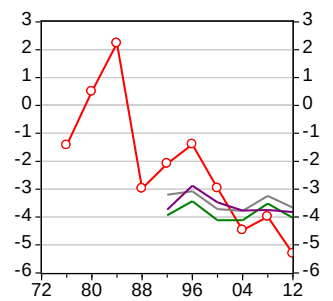



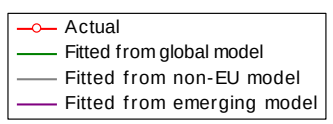

Serbia

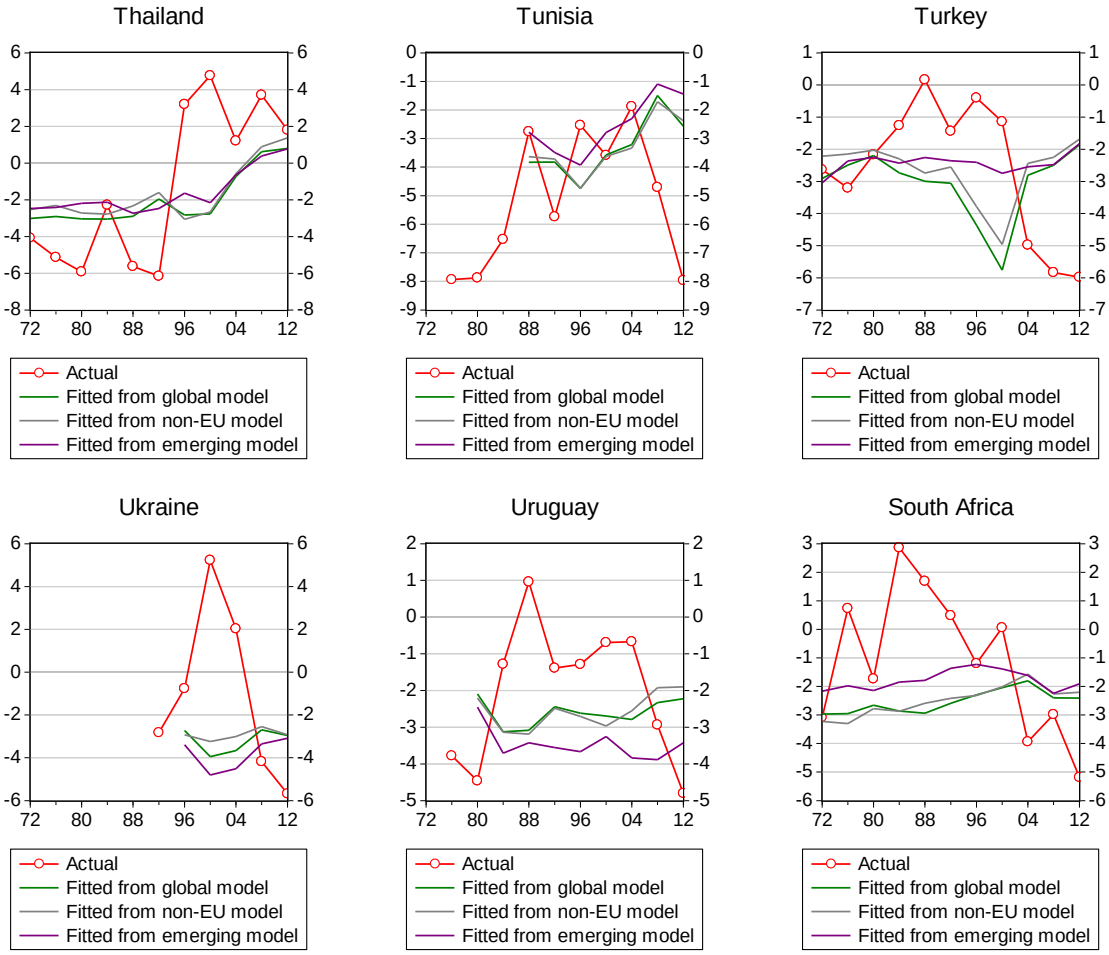



El Salvador






*Note: Fitted values are derived from the estimation results (restricted versions) reported in Table 2. The sample period includes 4-year non-overlapping periods (e.g. the last observation refers to 2012-15).*

## Appendix D: Contributions to the change in fitted current account values from 2004-07 to 2012-15 using the global model (% GDP)

| | | AR | AT | AU | BE | BG | BR | CA | CH | CL | CN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | Fitted value 2004-2007 | -1.1 | -0.3 | 0.1 | 1.0 | -2.7 | -1.9 | 2.3 | 4.3 | -0.5 | -1.5 |
| (2) | Fitted value 2012-2015 | -0.5 | 0.7 | -0.7 | 1.6 | -4.8 | -0.8 | 2.2 | 4.5 | 0.5 | 0.2 |
| (3)=(2)-(1) | Change in fitted value | 0.7 | 1.0 | -0.8 | 0.6 | -2.1 | 1.1 | 0.0 | 0.2 | 1.0 | 1.7 |
| (3.1) | *Contribution of Fiscal balance* | *-0.5* | *0.2* | *-0.5* | *-0.2* | *-0.8* | *0.2* | *-0.3* | *0.2* | *-0.8* | *0.4* |
| (3.2) | *Contribution of Growth differential* | *0.5* | *0.0* | *-0.1* | *0.0* | *0.3* | *0.2* | *0.0* | *0.0* | *0.0* | *0.3* |
| (3.3) | *Contribution of GDP per capita* | *0.3* | *0.0* | *0.1* | *-0.1* | *0.2* | *0.1* | *0.0* | *0.1* | *0.2* | *0.4* |
| (3.4) | *Contribution of Old dependency ratio* | *-0.1* | *-0.3* | *-0.2* | *-0.2* | *-0.3* | *-0.2* | *-0.3* | *-0.3* | *-0.2* | *-0.2* |
| (3.5) | *Contribution of Aging speed* | *0.2* | *0.8* | *0.2* | *0.7* | *-0.2* | *0.6* | *0.4* | *0.4* | *0.8* | *1.0* |
| (3.6) | *Contribution of Lagged NFA* | *1.3* | *0.3* | *0.1* | *0.4* | *-1.3* | *0.4* | *0.1* | *-0.2* | *0.9* | *0.3* |
| (3.7) | *Contribution of Oil rents* | *-1.0* | *0.0* | *-0.2* | *0.0* | *0.0* | *-0.3* | *0.2* | *0.0* | *0.0* | *-0.5* |
| (3.8) | *Contribution of Legal system* | *0.0* | *-0.1* | *-0.1* | *0.0* | *0.0* | *0.1* | *0.0* | *0.0* | *0.0* | *0.0* |
| (4) | Actual value 2004-2007 | 2.0 | 2.5 | -6.2 | 4.8 | -14.8 | 1.2 | 1.6 | 13.0 | 3.2 | 6.9 |
| (5) | Actual value 2012-2015 | -0.9 | 1.8 | -3.6 | 0.7 | 0.4 | -3.3 | -2.8 | 8.3 | -2.4 | 2.4 |
| (6)=(4)-(1) | Gap 2004-2007 | 3.2 | 2.8 | -6.3 | 3.8 | -12.2 | 3.1 | -0.7 | 8.7 | 3.7 | 8.4 |
| (7)=(5)-(2) | Gap 2012-2015 | -0.4 | 1.0 | -2.9 | -0.9 | 5.1 | -2.5 | -5.0 | 3.8 | -2.9 | 2.2 |

| | | CO | CR | CY | CZ | DE | DK | DO | EE | ES | FI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | Fitted value 2004-2007 | -0.3 | -2.6 | 0.2 | -1.4 | 0.2 | 2.1 | -3.9 | -4.0 | -1.4 | 1.3 |
| (2) | Fitted value 2012-2015 | 0.9 | -1.9 | -1.6 | -2.5 | 2.6 | 1.1 | -3.6 | -3.1 | -2.9 | 0.5 |
| (3)=(2)-(1) | Change in fitted value | 1.3 | 0.7 | -1.8 | -1.1 | 2.4 | -1.1 | 0.3 | 0.9 | -1.5 | -0.8 |
| (3.1) | *Contribution of Fiscal balance* | *0.3* | *-0.2* | *-0.2* | *0.1* | *0.9* | *-0.7* | *-0.1* | *0.1* | *-1.3* | *-0.8* |
| (3.2) | *Contribution of Growth differential* | *0.0* | *0.1* | *0.4* | *0.3* | *-0.1* | *0.0* | *0.1* | *0.3* | *0.2* | *0.2* |
| (3.3) | *Contribution of GDP per capita* | *0.1* | *0.1* | *-0.4* | *0.0* | *0.2* | *-0.3* | *0.2* | *0.1* | *-0.2* | *-0.2* |
| (3.4) | *Contribution of Old dependency ratio* | *-0.1* | *-0.1* | *-0.2* | *-0.5* | *-0.3* | *-0.5* | *-0.1* | *-0.2* | *-0.2* | *-0.6* |
| (3.5) | *Contribution of Aging speed* | *0.5* | *0.8* | *0.4* | *-0.5* | *1.3* | *-0.1* | *0.5* | *0.0* | *1.1* | *-0.4* |
| (3.6) | *Contribution of Lagged NFA* | *0.2* | *0.0* | *-1.8* | *-0.5* | *0.5* | *0.9* | *-0.3* | *0.5* | *-0.9* | *1.0* |
| (3.7) | *Contribution of Oil rents* | *0.3* | *0.0* | *0.0* | *0.0* | *0.0* | *-0.3* | *0.0* | *0.0* | *0.0* | *0.0* |
| (3.8) | *Contribution of Legal system* | *0.0* | *0.0* | *-0.1* | *0.0* | *-0.1* | *-0.1* | *0.0* | *0.0* | *0.0* | *0.0* |
| (4) | Actual value 2004-2007 | -1.8 | -5.0 | -6.8 | -2.9 | 5.5 | 3.1 | -1.4 | -12.7 | -7.9 | 5.2 |
| (5) | Actual value 2012-2015 | -4.3 | -4.6 | -2.9 | 0.0 | 7.4 | 6.3 | -4.0 | -1.0 | 0.4 | -0.7 |
| (6)=(4)-(1) | Gap 2004-2007 | -1.5 | -2.4 | -7.0 | -1.5 | 5.2 | 1.0 | 2.6 | -8.7 | -6.5 | 3.9 |
| (7)=(5)-(2) | Gap 2012-2015 | -5.3 | -2.8 | -1.3 | 2.5 | 4.8 | 5.2 | -0.4 | 2.1 | 3.2 | -1.3 |

| | | FR | GB | GR | GT | HK | HR | HU | ID | IE | IL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | Fitted value 2004-2007 | -0.4 | -0.8 | -3.8 | -2.9 | 10.0 | -3.0 | -4.7 | -1.4 | 1.0 | -2.3 |
| (2) | Fitted value 2012-2015 | -1.2 | -1.4 | -3.4 | -2.9 | 13.5 | -4.0 | -4.4 | -1.8 | -1.5 | -0.9 |
| (3)=(2)-(1) | Change in fitted value | -0.8 | -0.6 | 0.5 | 0.0 | 3.5 | -1.0 | 0.3 | -0.4 | -2.5 | 1.4 |
| (3.1) | *Contribution of Fiscal balance* | *0.1* | *-0.2* | *0.9* | *0.3* | *0.3* | *-0.2* | *1.0* | *0.1* | *-0.9* | *0.3* |
| (3.2) | *Contribution of Growth differential* | *0.0* | *-0.1* | *0.3* | *-0.1* | *0.3* | *0.3* | *0.0* | *-0.2* | *0.1* | *0.1* |
| (3.3) | *Contribution of GDP per capita* | *-0.1* | *-0.1* | *-0.6* | *0.0* | *0.5* | *-0.1* | *-0.1* | *0.1* | *-0.4* | *0.2* |
| (3.4) | *Contribution of Old dependency ratio* | *-0.3* | *-0.3* | *-0.2* | *0.0* | *-0.3* | *-0.2* | *-0.2* | *0.0* | *-0.2* | *-0.1* |
| (3.5) | *Contribution of Aging speed* | *0.3* | *0.4* | *0.7* | *0.1* | *1.6* | *0.5* | *-0.3* | *0.6* | *0.4* | *0.1* |
| (3.6) | *Contribution of Lagged NFA* | *-0.8* | *-0.1* | *-0.5* | *-0.1* | *1.1* | *-1.2* | *0.0* | *0.2* | *-1.6* | *0.8* |
| (3.7) | *Contribution of Oil rents* | *0.0* | *-0.1* | *0.0* | *-0.2* | *0.0* | *0.0* | *0.0* | *-1.1* | *0.0* | *0.0* |
| (3.8) | *Contribution of Legal system* | *0.0* | *0.0* | *-0.1* | *0.0* | *0.0* | *0.0* | *-0.1* | *0.0* | *0.0* | *0.0* |
| (4) | Actual value 2004-2007 | -0.4 | -2.1 | -9.4 | -4.9 | 11.9 | -5.7 | -7.4 | 1.6 | -3.2 | 3.1 |
| (5) | Actual value 2012-2015 | -1.0 | -4.6 | 0.1 | -2.2 | 1.7 | 0.9 | 3.8 | -3.0 | 4.2 | 2.7 |
| (6)=(4)-(1) | Gap 2004-2007 | 0.0 | -1.3 | -5.6 | -2.0 | 1.9 | -2.7 | -2.7 | 3.0 | -4.2 | 5.4 |
| (7)=(5)-(2) | Gap 2012-2015 | 0.2 | -3.3 | 3.5 | 0.7 | -11.8 | 4.9 | 8.2 | -1.1 | 5.8 | 3.6 |

| | | IN | IS | IT | JP | KR | LK | LT | LU | LV | MA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | Fitted value 2004-2007 | -4.0 | -0.7 | -1.4 | 1.5 | 1.4 | -4.6 | -3.6 | 7.7 | -4.2 | -3.3 |
| (2) | Fitted value 2012-2015 | -3.7 | -12.0 | -0.9 | -0.5 | 3.3 | -3.8 | -2.7 | 7.0 | -4.5 | -3.2 |
| (3)=(2)-(1) | Change in fitted value | 0.3 | -11.3 | 0.5 | -2.0 | 1.9 | 0.8 | 0.9 | -0.7 | -0.2 | 0.1 |
| (3.1) | *Contribution of Fiscal balance* | *0.3* | *-0.4* | *0.4* | *-0.3* | *0.4* | *0.6* | *0.1* | *0.0* | *0.2* | *-0.1* |
| (3.2) | *Contribution of Growth differential* | *0.1* | *0.3* | *0.1* | *-0.1* | *0.0* | *-0.2* | *0.2* | *0.1* | *0.4* | *-0.1* |
| (3.3) | *Contribution of GDP per capita* | *0.1* | *-0.1* | *-0.4* | *-0.1* | *0.4* | *0.2* | *0.3* | *-0.4* | *0.2* | *0.1* |
| (3.4) | *Contribution of Old dependency ratio* | *-0.1* | *-0.2* | *-0.3* | *-1.0* | *-0.4* | *-0.2* | *0.0* | *0.0* | *-0.2* | *0.0* |
| (3.5) | *Contribution of Aging speed* | *0.3* | *0.5* | *1.0* | *-0.9* | *1.5* | *0.3* | *0.6* | *1.0* | *-0.1* | *0.6* |
| (3.6) | *Contribution of Lagged NFA* | *-0.2* | *-11.4* | *-0.2* | *0.5* | *0.1* | *0.1* | *-0.3* | *-1.4* | *-0.6* | *-0.5* |
| (3.7) | *Contribution of Oil rents* | *-0.1* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *-0.1* | *0.0* | *0.0* | *0.0* |
| (3.8) | *Contribution of Legal system* | *-0.1* | *-0.1* | *0.0* | *0.0* | *-0.1* | *0.1* | *0.0* | *0.0* | *0.0* | *0.0* |
| (4) | Actual value 2004-2007 | -1.0 | -15.6 | -1.1 | 4.1 | 1.7 | -3.8 | -10.0 | 10.8 | -16.3 | 1.4 |
| (5) | Actual value 2012-2015 | -2.3 | 3.0 | 1.2 | 1.0 | 5.9 | -4.1 | 0.1 | 5.1 | -2.7 | -6.6 |
| (6)=(4)-(1) | Gap 2004-2007 | 3.0 | -14.9 | 0.3 | 2.6 | 0.3 | 0.8 | -6.5 | 3.1 | -12.1 | 4.7 |
| (7)=(5)-(2) | Gap 2012-2015 | 1.4 | 15.1 | 2.1 | 1.5 | 2.6 | -0.3 | 2.7 | -1.9 | 1.7 | -3.4 |

| | | MT | MX | MY | NL | NO | NZ | PE | PH | PK | PL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | Fitted value 2004-2007 | 1.2 | -0.1 | 1.2 | 1.8 | 11.5 | -0.7 | -2.4 | -4.1 | -4.2 | -2.7 |
| (2) | Fitted value 2012-2015 | 0.0 | -0.4 | 1.3 | 2.4 | 9.3 | -0.9 | -1.3 | -2.4 | -4.1 | -2.3 |
| (3)=(2)-(1) | Change in fitted value | -1.2 | -0.2 | 0.1 | 0.7 | -2.2 | -0.2 | 1.1 | 1.7 | 0.1 | 0.4 |
| (3.1) | *Contribution of Fiscal balance* | *0.4* | *-0.1* | *0.3* | *-0.1* | *-0.5* | *-0.4* | *0.3* | *0.6* | *-0.2* | *0.2* |
| (3.2) | *Contribution of Growth differential* | *-0.2* | *0.0* | *-0.1* | *0.1* | *-0.1* | *-0.1* | *0.1* | *-0.2* | *0.1* | *0.1* |
| (3.3) | *Contribution of GDP per capita* | *0.1* | *0.0* | *0.2* | *-0.1* | *-0.2* | *-0.1* | *0.2* | *0.0* | *-0.1* | *0.4* |
| (3.4) | *Contribution of Old dependency ratio* | *-0.5* | *-0.1* | *-0.1* | *-0.5* | *-0.2* | *-0.3* | *-0.1* | *-0.1* | *0.0* | *-0.2* |
| (3.5) | *Contribution of Aging speed* | *-0.1* | *0.5* | *0.4* | *0.5* | *0.4* | *0.3* | *0.4* | *0.2* | *0.2* | *0.1* |
| (3.6) | *Contribution of Lagged NFA* | *-0.9* | *-0.1* | *0.7* | *0.8* | *0.9* | *0.2* | *0.5* | *1.2* | *0.0* | *-0.3* |
| (3.7) | *Contribution of Oil rents* | *0.0* | *-0.5* | *-1.2* | *0.0* | *-2.4* | *0.1* | *-0.2* | *0.0* | *-0.1* | *0.0* |
| (3.8) | *Contribution of Legal system* | *0.0* | *-0.1* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.1* |
| (4) | Actual value 2004-2007 | -6.7 | -1.0 | 14.5 | 7.3 | 14.2 | -6.4 | 1.6 | 3.7 | -1.9 | -4.6 |
| (5) | Actual value 2012-2015 | 3.1 | -2.0 | 4.1 | 10.0 | 9.6 | -3.9 | -3.9 | 4.2 | -1.4 | -2.0 |
| (6)=(4)-(1) | Gap 2004-2007 | -7.9 | -0.9 | 13.3 | 5.5 | 2.8 | -5.7 | 4.0 | 7.8 | 2.2 | -1.9 |
| (7)=(5)-(2) | Gap 2012-2015 | 3.1 | -1.6 | 2.8 | 7.5 | 0.4 | -3.0 | -2.6 | 6.7 | 2.7 | 0.3 |

| | | PT | RO | RU | SE | SG | SI | SK | SQ | SV | TH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | Fitted value 2004-2007 | -3.4 | -3.0 | 6.5 | -0.4 | 12.2 | -0.6 | -2.2 | -3.6 | -4.1 | -0.7 |
| (2) | Fitted value 2012-2015 | -3.5 | -3.0 | 4.0 | -0.9 | 12.3 | -2.0 | -2.3 | -3.7 | -4.0 | 0.8 |
| (3)=(2)-(1) | Change in fitted value | -0.1 | 0.0 | -2.4 | -0.5 | 0.1 | -1.4 | 0.0 | -0.1 | 0.1 | 1.5 |
| (3.1) | *Contribution of Fiscal balance* | *0.4* | *0.1* | *-1.3* | *-0.2* | *-0.2* | *-1.0* | *0.0* | *-1.0* | *0.2* | *0.0* |
| (3.2) | *Contribution of Growth differential* | *0.0* | *0.2* | *0.5* | *0.0* | *0.4* | *0.3* | *0.3* | *0.4* | *0.0* | *0.0* |
| (3.3) | *Contribution of GDP per capita* | *-0.1* | *0.2* | *0.2* | *0.0* | *0.9* | *-0.1* | *0.3* | *0.1* | *0.0* | *0.0* |
| (3.4) | *Contribution of Old dependency ratio* | *-0.3* | *-0.1* | *0.1* | *-0.4* | *-0.3* | *-0.3* | *-0.2* | *0.0* | *-0.1* | *-0.2* |
| (3.5) | *Contribution of Aging speed* | *0.8* | *0.5* | *0.4* | *-0.3* | *1.0* | *0.5* | *0.3* | *0.5* | *0.3* | *1.2* |
| (3.6) | *Contribution of Lagged NFA* | *-0.9* | *-0.8* | *0.1* | *0.4* | *-1.6* | *-0.8* | *-0.7* | *-0.3* | *-0.3* | *0.7* |
| (3.7) | *Contribution of Oil rents* | *0.0* | *-0.2* | *-2.4* | *0.0* | *0.0* | *0.0* | *0.0* | *0.2* | *0.0* | *0.0* |
| (3.8) | *Contribution of Legal system* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *-0.1* | *0.0* | *0.0* | *-0.1* |
| (4) | Actual value 2004-2007 | -9.7 | -10.0 | 9.0 | 7.5 | 22.7 | -2.6 | -6.2 | -12.1 | -4.5 | 1.2 |
| (5) | Actual value 2012-2015 | 0.3 | -1.7 | 3.4 | 6.6 | 18.7 | 5.3 | 0.8 | -7.1 | -5.3 | 1.8 |
| (6)=(4)-(1) | Gap 2004-2007 | -6.2 | -6.9 | 2.5 | 7.9 | 10.5 | -2.1 | -4.0 | -8.6 | -0.4 | 1.9 |
| (7)=(5)-(2) | Gap 2012-2015 | 3.8 | 1.3 | -0.6 | 7.6 | 6.4 | 7.2 | 3.0 | -3.4 | -1.3 | 1.0 |

| | | TN | TR | UA | US | UY | ZA |
|---|---|---|---|---|---|---|---|
| (1) | Fitted value 2004-2007 | -3.2 | -2.8 | -3.7 | 1.5 | -2.8 | -1.8 |
| (2) | Fitted value 2012-2015 | -2.6 | -1.9 | -3.0 | 1.0 | -2.2 | -2.4 |
| (3)=(2)-(1) | Change in fitted value | 0.6 | 0.9 | 0.7 | -0.5 | 0.6 | -0.6 |
| (3.1) | *Contribution of Fiscal balance* | *-0.2* | *0.3* | *-0.1* | *0.0* | *0.1* | *-0.5* |
| (3.2) | *Contribution of Growth differential* | *0.1* | *0.2* | *0.7* | *-0.1* | *-0.1* | *0.1* |
| (3.3) | *Contribution of GDP per capita* | *0.1* | *0.2* | *-0.1* | *-0.1* | *0.3* | *0.0* |
| (3.4) | *Contribution of Old dependency ratio* | *0.0* | *-0.1* | *0.1* | *-0.3* | *0.0* | *-0.2* |
| (3.5) | *Contribution of Aging speed* | *0.8* | *0.6* | *0.5* | *0.2* | *0.4* | *-0.1* |
| (3.6) | *Contribution of Lagged NFA* | *0.2* | *-0.2* | *-0.2* | *-0.2* | *0.0* | *0.1* |
| (3.7) | *Contribution of Oil rents* | *-0.2* | *0.0* | *-0.2* | *0.1* | *0.0* | *-0.1* |
| (3.8) | *Contribution of Legal system* | *-0.1* | *-0.1* | *0.0* | *-0.1* | *0.0* | *0.0* |
| (4) | Actual value 2004-2007 | -1.9 | -5.0 | 2.0 | -5.4 | -0.7 | -3.9 |
| (5) | Actual value 2012-2015 | -8.0 | -6.0 | -5.7 | -2.5 | -4.8 | -5.2 |
| (6)=(4)-(1) | Gap 2004-2007 | 1.3 | -2.2 | 5.7 | -6.9 | 2.1 | -2.1 |
| (7)=(5)-(2) | Gap 2012-2015 | -5.4 | -4.1 | -2.7 | -3.4 | -2.6 | -2.8 |

*Note: see notes to Table 3.*