# Cyclical Reaction of Fiscal Policy and its Relationship with the Current Account Balance*

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Abstract

Previous empirical studies verifying the relationship between the current account (CA) and government expenditures produced mixed results across regions and countries. We investigate whether cyclicality affects this relationship, based on a sample of 51 countries, using a structural panel vector autoregression model. Our findings indicate that a negative impact on the CA due to aggregate government spending shocks is only visible in countercyclical economies, suggesting the importance of cyclicality in explaining the dynamics of the present value model. However, cyclicality is not sufficient for explaining the link between disaggregate fiscal variables and the CA, owing to substantial heterogeneity. A country-by-country analysis shows that subsidies play a significant role in the CA of Austria, Croatia, Spain, and Bolivia. Property income is a major CA determinant in countries with large external debts and high market perception of sovereign credit risk. Conversely, the largest components of public spending (compensation of employees, intermediate consumption, and social benefits) play a minor role.

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# 1 Introduction

Among macroeconomic issues raised by recent years' expansionary fiscal policies, the expected response of the current account (CA) balance is one of the most ambiguous and challenging to understand and predict. On the one hand, some theoretical models suggest that fiscal deficits are accompanied by CA deficits if the relationship between private savings and investment is constant. On the other hand, large budget deficits increase interest rates and reduce the ability to borrow in international markets and, thereby, affect investments negatively and domestic savings positively, leading to CA surpluses. Understanding the relationship between fiscal policy and the CA is important because many countries have simultaneously suffered from fiscal and CA deficits in recent years and have prioritized improving these deficits by formulating appropriate economic policies.

So far, the existing empirical research on the topic has produced mixed results across regions and countries. The main focus of this study is to understand whether fiscal cyclicality explains some of this heterogeneity based on data from 51 countries from 2002Q1 to 2018Q4. Using the intertemporal model of the CA as a theoretical basis, the empirical investigation includes correlation coefficients, a panel vector autoregression (VAR), and a time series VAR analysis. The main novelty of the approach we use lies in the following features: 1) the use of fiscal cyclicality to explain the relationship between the main variables, 2) the adoption of a fully structural panel VAR that decomposes impulse responses into common and idiosyncratic components, while considering the underlying sample heterogeneity (based on Pedroni (2013)) and 3) the use of quarterly disaggregate fiscal data in addition to aggregate fiscal variables.

The results indicate that cyclicality matters when modeling the relationship between the CA and fiscal policy in the panel VAR study. The expected negative response of the CA to aggregate government spending only appears clearly in countercyclical economies, with a procyclical CA. Still, accounting for cyclicality is insufficient to explain the dynamics between disaggregate fiscal data and the CA in all country groups. A substantial heterogeneity across countries is reflected in quartile impulse responses and the decomposition into idiosyncratic and common shocks.

The country-by-country analysis reveals that the largest components of public spending (compensation of employees, intermediate consumption, and social benefits) do not strongly contribute to the CA variation. This finding implies that aggregate demand (specifically the change in imports of goods and services resulting from changes in government consumption and wages) is not the main channel through which fiscal policy affects the CA. In contrast, property income is a significant CA determinant in countries where sovereign credit risk is perceived as relatively high by the market over the period of study (such as Italy, Portugal and Greece). Additionally, subsidies play a significant role in the CA variation of some countries (e.g., Croatia, Austria, Spain, and Bolivia).

The remainder of this paper is organized as follows. In the next section, a literature review on the relationship between the CA and fiscal policy and on fiscal cyclicality is provided. Section 3 discusses the theoretical background, and the dataset and methodology are described in Section 4. The main stylized facts from the preliminary correlation analysis, are provided in Section 5. Sections 6 and 7 present the main findings of the empirical study based on the structural-panel and time-series VAR analyses. Finally, the last section offers some concluding remarks.

## 2 Literature review

Numerous literature and theories on the link between the CA and fiscal policy exist. Traditionally, it has been assumed that the CA moves in the same direction as the fiscal balance (as in the twin deficits hypothesis[1] or the Mundell-Fleming framework[2]). In contrast, other theories suggest that fiscal deficits might improve the CA.[3] Opposing views can also be found in the literature on the relationship between the CA and components of the budget balance. For instance, the Ricardian Equivalence Hypothesis (Barro (1974)) implies no relationship exists

[1]Formally, the relationship between the CA and the fiscal balance, is clear based on the identity $S^p - I + FB = CA$, derived from national income identities, where $S^p$ represents private savings, $I$ national investment, and $FB$ the fiscal balance, with $FB = T - G = S^g$ (which is government savings). $G$ is government expenditures on goods and services, and $T$ is tax revenues.

[2]This model shows that a budget deficit leads to a CA deficit through an increase in interest rates, in addition to other transmission channels that depend on the exchange rate regime and the nature of capital mobility

[3]One example is the two-country real business cycle model of Baxter (1995) that shows that a transitory reduction in distortionary tax rates on labor income, financed by future lump-sum taxes, may improve the CA but worsen the government budget. Another example is the model of Obstfeld and Rogoff (1995a) which states that a government spending increase tends to lead to an improvement of the CA as consumers smooth consumption (following the movement in output caused by the increase). In addition, this model implies that fiscal expansion may depreciate nominal and real exchange rates owing to higher interest rates.

between a CA deficit and taxes because tax changes have no impact on private consumption. Conversely, the intertemporal model of the CA implies a direct and adverse relationship between the CA and government expenditures (see the following section).

In the empirical literature, the link between fiscal policy and the CA is analyzed through different approaches. One approach is based on the "twin deficits" theoretical literature and directly examines the relationship between fiscal and CA balances.[4] Another approach aims at uncovering the main determinants of the CA using broader models that also include fiscal variables (e.g. Chinn and Prasad (2003)). Finally, another strand of research attempts to empirically verify the implications of the intertemporal model for the CA (discussed in the following section). Overall, the empirical literature is also characterized by a lack of consensus. Litsios and Pilbeam (2017) explain this disaccord by the different methodologies used and the underlying structural forces in the sample countries that may lead to different correlations. Here, we assume that the cyclicality of fiscal policy and the CA can explain the discrepancies in the literature. The rationale behind this idea is discussed in the following section.

Expectations regarding fiscal cyclicality in the literature vary based on the theoretical framework, leading to mixed results in empirical studies. The traditional Keynesian view is based on the idea that public expenditures should move in a countercyclical fashion and act as a catalyst for aggregate demand in times of recession. In contrast, the neoclassical framework precludes any countercyclical role for fiscal policy and often considers that government expenditures follow an exogenously given process (see Lucas Jr and Stokey (1983)). The most common empirical findings indicate that policy tends to be less countercyclical than what the Keynesian theory suggests. More specifically, several empirical studies have found that fiscal policy in developing countries is procyclical (Gavin and Perotti (1997); Talvi and Végh (2005); Braun (2001); Lane (2003); Thornton (2008)). Conversely, research on OECD economies usually reports an acyclical or slightly countercyclical fiscal policy (Lane (2003); Wyplosz (2002)).

On the other hand, according to Kaminsky et al. (2004), the CA would be procyclical

[4] For example, see Abell (1990), Enders and Lee (1990), Vamvoukas (1999), Normandin (1999) and Kearney and Monadjemi (1990).

in the standard model, since borrowing from abroad should be countercyclical to ensure consumption-smoothing.[5] They provided the following explanations to a countercyclical CA: a procyclical investment that dominates the savings effect, distortions in consumption induced by temporary policies leading to countercyclical savings (since consumption increases in prosperous times), and residents' dissaving as capital inflows increase in prosperous times.

# 3 Theoretical background

The main theoretical background for the present study is the intertemporal model of the CA as discussed by Obstfeld and Rogoff (1995b). It is based on an expression for the CA that can be derived from two elements. The first element is the national income identity and is used to obtain the following expression of the CA.

$$CA_t = r_t A_t + Y_t - C_t - G_t - I_t \tag{1}$$

where $A_t$ is the economy's stock of net foreign claims at the end of period $(t-1)$, $r_t$ is the net interest rate paid on these assets, $Y_t$ is the net domestic product, $G_t$ is government consumption, and $I_t$ is net investment. The second element is the permanent income hypothesis that implies a relationship between consumption and the present value of the income path (equivalent to the present value of the constant income). Based on this idea, the permanent level of consumption can be expressed in terms of the permanent levels of the net domestic product, investment, and government expenditures. These two elements yield the following expression that constitutes the prevalent theoretical framework for studying the dynamics of the CA (details on the derivation of the model are provided in Appendix A).

$$\begin{aligned} CA_t &= (r_t - \tilde{r}_t)A_t + (Y_t - \tilde{Y}_t) - (G_t - \tilde{G}_t) - (I_t - \tilde{I}_t) \\ &+ \left[1 - \frac{1}{(\widetilde{\beta/R})^{\sigma}}\right]\left(\tilde{r}_t A_t + \tilde{Y}_t - \tilde{G}_t - \tilde{I}_t\right) \end{aligned} \tag{2}$$

[5] Changes in the CA can be explained by the capital account if the impact of international reserves is ignored.

The letters with a tilde represent the permanent level of the variables and $(\widetilde{\beta/R})^{\sigma}$ is the weighted average ratio of the $s-t$ period's subjective and market discount factors

$$(\widetilde{\beta/R})^{\sigma} \equiv \frac{\sum_{s=t}^{\infty} R_{t,s}\left(\beta^{s-t}/R_{t,s}\right)^{\sigma}}{\sum_{s=t}^{\infty} R_{t,s}} \tag{3}$$

where the market discount rate for consumption at time $s$ is $R_{t,s} = \frac{1}{\prod_{v=t+1}^{s}(1+r_v)}$.

It can be seen from this approach that the intertemporal model rests on the fundamental idea that the CA movements can be explained by permanent income fluctuations, and that the CA can be perceived as a consumption smoothing tool by domestic residents (using foreign borrowing and lending). This idea is reflected in Equation (2), where the CA appears to depend on the short-run components of the permanent income variables and a final term that represents consumption tilting owing to differences between world interest rates and the domestic rate of time preference.[6] This last term implies that if the domestic rate of time preference is lower than future world interest rates,[7] there will be a secular tendency toward CA deficits, higher external debt and declining consumption (because in that case $(\widetilde{\beta/R})^{\sigma} < 1$).

Still, empirically, short-run dynamics are not often accounted for in studies of the intertemporal model of the CA. Instead, the most common approach is based on the following present value model (PVM) that can be obtained by combining the total income identity with an expression for the permanent level of consumption.

$$CA_t = -\sum_{i=1}^{\infty}\left(\frac{1}{1+r}\right)^{i} E_t \Delta NO_{t+i} \tag{4}$$

where the net output $NO_t$ is given by $NO_t = Y_t - I_t - G_t$ and $\Delta NO_{t+i} = NO_{t+i} - NO_{t+i-1}$. $Y_t, I_t, G_t$, and $r$ represent output, investment, government spending, and the non-stochastic world real interest rate, respectively. The commonly used approach to test the PVM empirically is the methodology of Campbell (1987) and Campbell and Shiller (1987) (see Appendix B).

[6] It can be noted that consumption for a consumer that does not tolerate intertemporal substitution ($\sigma = 0$) is always set at the permanent level of $\tilde{r}_t A_t + \tilde{Y}_t - \tilde{G}_t - \tilde{I}_t$. Therefore, consumption tilting from the permanent value mainly depends on the term defined in Equation (3).

[7] Implying the home country is more impatient than the rest of the world and therefore the present value of future income is perceived as lower than in the rest of the world.

More frequently, the PVM is rejected in the empirical literature (Ghosh and Ostry (1995); Milbourne and Otto (1992); Otto (1992); Sheffrin and Woo (1990)).[8] Usually, the modeled CA exhibits less volatility than the actual data. Many studies attempted to uncover the reasons behind the empirical failure of the PVM. The "usual suspects" for the PVM rejection by the data have been identified by Nason and Rogers (2006) as the non-separable preferences, fiscal policy, real interest rate shocks, external imperfect international capital mobility, and an internalized risk premium. The inclusion of shocks to interest rates has also been reported to improve the fit of the PVM in other studies (Bergin and Sheffrin (2000)). Most of these discussed factors were found to matter in some way in Nason and Rogers (2006) but not sufficiently to replicate the PVM predictions. For instance, the attention paid to transitory fiscal shocks was justified but lacked some other important factors. In particular, the internalized risk premium[9] and exogenous world real interest rate shocks were identified as some of the important factors that had to be included.

Here, we focus on the impact of changes in government spending on the CA. Fiscal shocks have been found to significantly explain some of the CA variability in many studies. Abbas et al. (2011) identified three major channels of transmission of these shocks to the CA (changes in aggregate demand[10] and the real exchange rate caused by the government's consumption or investment, and interest rates). Conversely, Ahmed (1986) and Ahmed and Rogers (1995) explained the importance of fiscal shocks by the fact that they affect external borrowing decisions. External borrowing is also closely related to the spread between domestic and world interest rates (as discussed in Nason and Rogers (2006)). This spread determines the costs of using the CA to smooth consumption for a given open economy (through changes in foreign assets). Therefore, shocks that affect government spending will have an impact on the CA depending on how they affect the costs of consumption smoothing (through countries' risk premium) and all of the aforementioned transmission channels in general (i.e., by increasing external debt, imports or affecting the real exchange rates and interest rates).

Examples of such shocks include those to the business cycle. Formally, it is evident from

[8] Although some authors could verify it successfully from empirical data (Campa and Gavilan (2011); Hoffmann (2013)).

[9] This factor alters the labor market response to permanent income shocks.

[10] More precisely the proportion of the demand for domestic goods relative to foreign goods.

the expression (2) that there is an interaction between the CA and cyclical components of the permanent income variables. Among those components are short-run fluctuations in government spending. For this reason, we consider that the nature of the response of fiscal variables to business cycle fluctuations is a determining factor in the interaction between the CA and government spending. This intuition is present in Equation (1) as well. Since both expressions (1) and (2) imply that there is "ceteris paribus" negative relationship between government spending and the CA, it is natural that this relationship would be altered if the model's variables are endogenous. The present study focuses on the correlation between the cyclical components of output and those of government spending and how changes in this correlation across countries affects the way the CA interacts with fiscal shocks. This assumption is all the more justified because fiscal cyclicality has been reported to vary across countries, as discussed in the previous section.

## 4 Data and approach

This study is conducted in three steps. First, we calculate cyclicality measures and perform a correlation analysis. Second, we estimate a panel VAR model based on the heterogeneous structural approach of Pedroni (2013). Finally, we use a time series VAR model to proceed with a country-by-country analysis.

### 4.1 Data description, calculation of cyclicality measures and correlation analysis

For the first step, quarterly data for a sample of 57 high- and middle-income countries for the period 1995Q1–2019Q2 are used (Appendix C). Data are extracted in real terms or deflated through a GDP deflator and are on a per capita basis. Fiscal cyclicality is measured in line with the recommendations of Kaminsky et al. (2004). They argued that the concept of fiscal policy cyclicality should be defined based on policy instruments, that is, government consumption and tax rates, as opposed to endogenously determining outcomes (the fiscal balance or tax revenues).[11] Further, they demonstrated how the use of any variable expressed as a percentage of gross domestic product (GDP) could be misleading in analyzing cyclical dynamics. Therefore, we use data in domestic currencies instead of ratios over GDP.

[11] Tax rates are not used in the present study because data are more difficult to obtain.

The cyclical components are extracted through the Hodrick-Prescott (HP) filter as it is a frequently used approach in the literature on fiscal cyclicality.[12]

After a general examination of the HP-detrended data, we draw some stylized facts and introduce disaggregate fiscal data into the analysis. This additional step is justified by explaining the mechanism through which fiscal spending can affect the CA with more clarity. The use of disaggregate spending data has been done in many previous studies on various topics (e.g., Lane (2003); Hercowitz and Strawczynski (2004); Castles and Dowrick (1990)) but can be more rarely found in the literature related to the relationship between the CA and fiscal policy.

Disaggregate data of government expenditures are obtained from the Government Finance Statistics (GFS) databases of Eurostat and the IMF. The Eurostat database is based on the ESA 2010 accounting standards. Government expenditures are defined as the sum of 12 ESA categories,[13] which we reduce to the six major components that are used in the IMF GFS database, to combine data from the two sources (see definitions provided in Appendix D). The sample is reduced to 51 countries for the period 2002Q1–2018Q4 when disaggregate data are included, owing to data availability.

## 4.2 Panel VAR approach

In the second step, we estimate a linear VAR model for the CA using variables from the intertemporal model of Equation (2). At this stage, data are converted from domestic currency to a percentage of GDP to conduct panel analysis. We also proceed with a demeaning of the data. The employed estimation method is the heterogeneous structural VAR approach of Pedroni (2013). Its unique feature is the fact that it accounts for the presence of heterogeneity within the panel. The heterogeneity that is accounted for goes beyond the simple fixed effects and extends to all of the dynamics of the model. Moreover, it can be concretely observed by decomposing the different impulse responses into responses to idiosyncratic and common shocks. The estimated VAR model for a country $i$ is expressed as follows

$$Z_{it} = AZ_{i,t-1} + \epsilon_{it} \tag{5}$$

[12]See Talvi and Végh (2005), Kaminsky et al. (2004), and Calderon et al. (2017).
[13]ESA 2010 Manual, p. 274.

With the vector $Z_{it}$ defined as $Z_{it} = [G_{it}\ r_{it}\ NFA_{it}\ I_{it}\ CA_{it}]'$, where $G_{it}$ is total government expenditures of country $i$ and is replaced by disaggregate government spending variables in a subsequent step, $r_{it}$ is the short-term interest rate, $NFA_{it}$ represents the net foreign assets, $I_{it}$ is net investment, and $CA_{it}$ the current account balance. As opposed to the PVM of Equation (4), two additional variables are included: Net foreign assets as they have often been found to affect CA volatility (e.g., Das (2016); Chinn and Prasad (2003)) and short-term interest rates since they improve the fit of the present value model when included (Bergin and Sheffrin (2000)).

We use the model to study the impact of changes in government spending on the CA for groups of countries. The econometric approach[14] can be summarized as follows (see details in Appendix E):

1. Estimating the reduced-form VAR model (5) country by country
2. Calculating the time effects across the sample (or group of countries) $\bar{Z}_t = N_t^{-1} \sum_{i=1}^{N_t} Z_{it}$ and using them to estimate a VAR model for the sample (or group)
3. Using the identifying restrictions to obtain the structural composite and common shocks estimates from the estimations in steps 1 and 2, respectively
4. For each country, running a regression between its composite shocks and the common shocks to obtain the idiosyncratic shocks (corresponding to the residuals)
5. Computing the composite, common, and member-specific impulse response functions
6. Using the distribution of the estimated responses to describe properties of the sample (median, first, and third quartiles)

The decomposition of the different responses between those to idiosyncratic and those to common shocks, provides many advantages. The first advantage is the control for cross-sectional dependence, since responses of common shocks across members of the panel can be isolated. The second advantage is the ability to assess the homogeneity within groups of countries by comparing idiosyncratic and common responses to shocks of the same nature in

[14]Implemented using an algorithm by Góes (2016) based on Pedroni (2013).

terms of sign and magnitude. More precisely, it is expected that most of the responses would be common shocks for a highly homogeneous group. Conversely, if the relationship between variables is the same across countries, but shocks are mostly idiosyncratic, the share of the idiosyncratic response from the total response would be higher, but its sign would be the same as the common response.

The identification strategy is based on a scenario of an exogenous fiscal policy and an endogenous CA balance. Thus, government expenditures are placed first, and the CA last in the Cholesky ordering (same ordering as in Equation (5)). Furthermore, as a robustness check, different orderings are tried for the model's variables in the first estimation with aggregate data. Finally, the study is supplemented with a time-series analysis of CA fiscal determinants to better understand heterogeneity among countries, using a Bayesian VAR approach (details are provided in Appendix F).

## 5 Stylized facts

This section presents an overview of the main stylized facts uncovered through a general examination of the collected data. Different sample splits are applied, comparing OECD with non-OECD countries and different regional and income groups.

Stylized fact 1: Generally, fiscal policy tends to be countercyclical or acyclical in the OECD group and procyclical in non-OECD economies

In line with the results of previous empirical studies, we find that the fiscal policy in OECD countries are, in most cases, either acyclical or countercyclical, whereas in developing economies, and particularly Latin American countries, it is procyclical (Table 1).

Stylized fact 2: The CA tends to behave acyclically or countercyclically

As opposed to expectations, the CA does not appear to be procyclical during the studied period (Table 1). The correlation coefficient between cyclical components of the CA and GDP is negative in 33 countries and positive in 18.[15] This result could be owing to dynamics of the exchange rate or, as previously stated in Section 2, to countercyclical savings, high capital inflows in expansions, or procyclical investments that overpower the savings effects. It could also be explained by a positive correlation between output and expectations of future

[15]Countries with the most procyclical CA are Croatia (0.77) and Canada (0.56).

income, leading to a positive response of private consumption and thereby a negative impact on the CA.

Stylized fact 3: The correlation between the CA and government consumption expenditure differs across countries, leading to poor average coefficients by groups
The average correlation coefficients between cyclical components of the CA and general government consumption expenditures by income groups and by regions are weak (Table 1). Nonetheless, coefficients by country are not small; they differ substantially within each group.

Stylized fact 4: The most significant components of government spending are "Compensation of employees," "Social benefits," and "Intermediate consumption of goods and services"
The most significant components appear to be "Compensation of employees," "Social benefits," and "Intermediate consumption of goods and services," with a total share of 75% in all expenditures (Table 2).[16]

Stylized fact 5: Procyclicality of middle-income economies appears more notably in "Compensation of employees" and "Intermediate consumption"
Fiscal cyclicality measures for disaggregate spending data (Table 3) indicate that the procyclicality of non-OECD/middle-income is more notable in "Compensation of employees" and "Intermediate consumption of goods and services."

Stylized fact 6: Average correlation by groups between disaggregate government expenditures and the CA is small owing to differences across countries
Average correlation coefficients (Tables 3 and 4) reveal an overall weak relationship between cyclical components of disaggregate expenditures and the CA by groups of countries. As in stylized fact 3, these small figures result from significant discrepancies between countries of each group and not from a weak interrelation between fiscal variables and the CA.

# 6 The CA and aggregate government spending

In the following sections, we use the structural panel VAR approach of Pedroni (2013) to analyze the relationship between government spending and the CA by groups of countries. This approach controls for country-fixed effects and allows for full heterogeneity of dynamics

[16]It can also be noted that the shares for "Compensation for employees" and, especially, "Intermediate consumption of goods and services" are relatively larger for non-OECD/ middle-income economies compared to OECD/high-income economies. The opposite is true for social benefits.

across countries. The identification strategy is based on a scenario of an exogenous fiscal policy and an endogenous CA. Therefore, in ordering the variables, government expenditures are placed first, and the CA last (alternative orderings are also tried).

### 6.1 General estimation of the CA model for the whole sample

First, we proceed with a general estimation of median composite impulse responses of the CA to a one-unit shock in the other variables of the model (Equation (5)). The result is shown in Figure 1 with confidence intervals based on 100 bootstrap repetitions. From previous theoretical discussions and empirical studies, it would be expected that total government spending would have an adverse impact on the CA balance. Results show a negative median response. However, the confidence bands suggest that the relationship is not statistically strong.

Then, we use the distribution of all individual responses to plot the median, average, and the 1st and 3rd quartiles of responses.[17] The resulting figure (Figure 2) shows that the response of the CA to total government expenditures and interest rate shocks is disparate across sample countries.[18] Conversely, the CA responds positively and significantly to a change in net foreign assets and adversely to a change in gross fixed capital formation in Figures 1 and 2.[19] It is also important to note that the magnitude of the response to government spending and interest rate shocks is smaller than the magnitude of the response to net foreign assets. Finally, to verify the validity of the identification strategy, the model is re-estimated using different orderings of the variables.[20] Results show no significant difference between the alternative specifications.[21]

[17] Since this representation shows the response of most of the sample, it is more informative than the median with bootstrap confidence intervals or the traditional averaging methods used for panels.

[18] More precisely, 22 out of the 51 countries show an immediate positive response.

[19] Responses of the CA to net foreign assets, gross fixed capital formation and the interest rate are not discussed in the remainder of the paper as they do not differ, in subsequent estimations, from those in Figures 1 and 2.

[20] Detailed results are unreported here owing to space limits.

[21] If the CA is placed before government spending, its response to fiscal shocks is less significant. However, this still does not change the main conclusion from this first estimation. Moreover, placing the CA before or after the interest rate does not alter the results.

### 6.2 The impact of cyclicality on the relationship between the CA and total government spending

This section examines whether fiscal cyclicality explains discrepancies across countries in the relationship between the two key variables. To do so, we first divide the sample into terciles based on fiscal cyclicality (i.e., the correlation between cyclical components of the GDP and total government expenditures, as in Table 1). The aim is to separate the sample into countercyclical, acyclical, and procyclical countries. The following groups are obtained:

- Group 1: countercyclical countries. This is the 1st tercile group in terms of fiscal cyclicality (correlation between cyclical components of government spending and those of GDP $<$ -0.09)

- Group 2: acyclical countries (2nd tercile group, with a correlation between -0.09 and 0.05).

- Group 3: procyclical countries (3rd tercile group, correlation with GDP $>$ 0.05).

We also distinguish, within each group, between countries based on the sign of the correlation between the CA and GDP. The model is then re-estimated for each of these groups. If the ability of fiscal policy to affect the CA depends on its interaction with the business cycle, then the response of the CA to fiscal shocks would be homogeneous within groups of similar cyclicality.[22]

This assumption is confirmed through estimation of average correlation coefficients by cyclicality group (Table 5). First, we remark that the correlation between the CA and government spending is relatively higher in countercyclical economies. Second, we note that this correlation is only negative in countercyclical economies with a procyclical CA (10 out of 51 countries). The relationship between the two variables is conversely positive for countercyclical economies with a countercyclical CA.

Using the structural panel VAR model, quartile composite impulse responses are estimated for the cyclical groups of Table 5. The outcome, in Figure 3, confirms the findings

[22]For example, if the CA is procyclical, then a negative relationship between government spending and the CA would be visible in countercyclical economies. Conversely, the relationship would be less predictable if the fiscal policy or the CA is acyclical.

from the correlation analysis for countercyclical economies. Response in the case of procyclical economies is statistically less significant as the median lies close to zero. We conclude from this section that, instead of predictions from the theory, a positive shock to aggregate government spending does not necessarily induce a negative response from the CA. The cyclicality of fiscal policy and the CA affect the relationship between the two variables. Finally, the response of the CA to public spending shocks is more uniform and significant in countercyclical economies.

# 7 The CA and disaggregate government spending

We then replace total government expenditures in the model by disaggregate fiscal data.[23] A first analysis is made on the countercyclical group, where a significant response was noted in the previous section (more details on this group are provided in Appendix G).

## 7.1 Response of the CA to disaggregate spending variables in countercyclical economies

In the countercyclical group with a countercyclical CA

As reported in the previous section, the CA responds positively to a positive government spending shock in the group of countercyclical economies with a countercyclical CA. The country's detailed responses show that all seven countries of the group respond positively to the shock, except for Switzerland. By spending component, the average response of the CA is positive after a shock to all variables, except subsidies. Nonetheless, the highest responses on impact are those of social benefits and compensation of employees. In the second quarter, the responses to intermediate consumption and subsidies get significantly higher (and compensation of employees to a lesser extent), whereas the responses to property income[24], and social benefits drop.

This implies that the immediate response of the CA to social benefits and compensation of employees is the main driver behind the positive response to total government spending

[23] As it is challenging to order disaggregate expenditures based on economic logic, Granger causality tests are used as a reference. The following ordering of the variables is obtained: property income, subsidies, compensation of employees, intermediate consumption, social benefits, other expenditures, interest rate, net foreign assets, gross fixed capital formation, and the CA.

[24] Property income comprises payable income such as interests, dividends, and rents on natural resources. The share of interest payments is, however, the most significant one (particularly interests on debt securities).

on impact, whereas responses to intermediate consumption and subsidies also explain the positive response in the second quarter. Details by country indicate that the response to social benefits is positive on impact in all countries, except France. Conversely, the group's average response to compensation of employees, intermediate consumption, and subsidies is mainly driven by the responses of two countries: Latvia and Slovakia. Therefore, we conclude that the positive response in this group is essentially explained by the positive response of the CA to social benefits, which also represent the largest and most countercyclical component of total government spending, on average.

In the countercyclical group with a procyclical CA

In this group of ten countries, the CA responds adversely to a positive government spending shock. The average response of the CA to this shock is negative in all countries except Denmark. By component, the average response of the CA is negative on impact only after a shock to property income (and to a lesser extent, "other expenses"). The highest positive responses are the ones to intermediate consumption and subsidies. These responses get negative in the third quarter.

Details by country indicate that, on impact, the response of the CA to property income shocks is negative in all countries, except Austria and Belgium. In the following quarters, the response of Japan and Croatia gets notably positive. The negative weight of the response to property income in total government spending is mitigated by the positive response to intermediate consumption and subsidies, which can be observed in most countries. Finally, the response to social benefits is negative in most countries but appears positive on average, primarily because of Luxembourg and Belgium's positive and high response. To sum up, in this group, there is a negative response to total spending because of a negative response to property income and (although less homogeneous) a negative response to social benefits shocks. This can be seen in Figure 4.

### 7.2 Decomposition between common and idiosyncratic shocks in the model with disaggregate fiscal variables

It has been seen from the previous section that there are differences across countries in terms of the response of the CA to the different spending components. These differences are even more marked in the groups of acyclical and procyclical economies. Although different other groupings of countries are tried (such as regions and income), it is challenging to detect obvious patterns for each component. Decomposing responses to shocks into idiosyncratic and common components confirms the heterogeneity that characterizes the relationship between the CA and disaggregate spending.

Figure 5 (based on fiscal cyclicality groups) reveals that most composite responses are characterized as responses to idiosyncratic rather than to common shocks. Further, responses to common shocks are opposite in direction to responses to idiosyncratic shocks in some cases. That is because countries within each panel do not respond in a similar way to global shocks.[25] For instance, the 2007 financial crisis led to a deterioration of the fundamentals of some countries (a negative shock, especially in 2008Q4); however, countries that have been able to weather the crisis or those that were affected after a delay do not exhibit a significant change in the variables at the same period (the changes in the residuals are small). Consequently, in the latter group, common shocks and composite shocks are negatively correlated.

Figure 6 provides an example based on the decomposition of the median composite response to property income in the fiscal cyclicality group 1.[26] Here, common and composite shocks are negatively correlated because the average property income for countries in the group received an adverse shock in 2008Q4; however, at the individual level, many countries were either less affected or received this fiscal shock on a different date in 2008 or 2009.[27]

## 7.3 A time-series analysis of the CA model with disaggregate data

The heterogeneity of responses to disaggregate government spending shocks suggests the absence of a strong and robust relationship between a particular spending category and

[25] While decomposing individual composite shocks, the term of the loading matrix corresponding to common shocks is negative, implying a negative correlation between individual and common shocks.

[26] In Figure 6, we separate group 1 into two subgroups: subgroup (a), with countries where responses to common shocks and those with composite shocks have opposite signs; and subgroup (b), where both responses have the same direction. At the crisis period, we find that the interest rate is the principal driving factor behind property income shocks in almost all countries. In most countries in the group, this variable was negatively affected in 2018Q4 owing to governments' intervention at the time. However, while in subgroup (a), the resulting structural shock to property income is positive owing to a negative effect from interest rates, in the subgroup (b), the resulting structural shock is negative.

[27] Expressing the structural shock to the variable $s$ at time $t$ as $\epsilon_{st} = {\beta_s}^{-1}\mu_t$, where $\mu_t$ is a vector of reduced-form shocks at $t$ and $\beta_s$ a vector of contemporaneous effects on $s$ from the Cholesky factor. The principal element in $\mu_t$ in the example is the interest rate (in 2018Q4) with a significant negative shock. However, in subgroup (a), the corresponding factor in ${\beta_s}^{-1}$is also negative, leading to an overall positive structural shock, whereas in subgroup (b), this term is positive.

the CA for a given group of countries. Therefore, we run a time-series analysis to uncover the strongest contributors to CA determination by country. Bayesian VAR estimation is used based on an independent normal-Wishart prior with Gibbs sampling (see Appendix F) to derive the variance decomposition of the CA by country (Table 6). The choice of this method is justified by the need to account for the uncertainties related to the determination of parameter values. As a robustness check, the same model is re-estimated with a different prior based on the Litterman-Minnesota approach (Table 7).

The variance decomposition[28] indicates the absence of common patterns within groups of similar fiscal cyclicality. It may also be noted that the relationship between the CA and the variables of property income and social benefits in countercyclical economies is not particularly significant (despite findings of Section 7.1). This can be attributed to the lower magnitude of CA's response to shocks in these two variables, compared to other variables of the model (e.g., NFAs).[29] Therefore, results of Section 7.1 imply that a relatively homogeneous relationship (in terms of sign) exists between the CA and the variables of property income and social benefits in countercyclical economies. They do not imply that these variables are the most important determinants of CA variations.

In general, the variance decomposition shows the three largest components of government expenditures (compensation of employees, intermediate consumption, and social benefits) play a minor role in CA determination.[30] This finding is significant, since many authors believe the main channel through which fiscal policy influences the CA is aggregate demand, as changes in government consumption and investment affect imports of goods and services and wages. However, the weak contribution of these components is an indication that this is not the case.

A large share of subsidies in the CA variance decomposition could indicate that subsidized industries mainly rely on imports or exports, but further investigation on detailed subsidies data is necessary to confirm this assumption. In countercyclical economies, this category of spending plays a significant role in Croatia and Austria. In acyclical economies, the highest

[28]Values after eight quarters

[29]This is confirmed by plotting responses of the CA by country after a shock to all variables on the same chart. The plots are unreported here owing to space limits.

[30]The share of government compensation of employees is relatively significant in Estonia, Slovenia and Moldova, although these are exceptions.

contribution of subsidies can be seen in Spain and Bulgaria. In procyclical economies, a relatively marked contribution of subsidies exists in Bolivia. In some of these economies, the government sector is strongly intertwined with the external sector due to the strong presence of SOEs in key trade sectors. The role played by the government sector is particularly marked in the cases of Croatia,[31] Bolivia[32] and Bulgaria.[33]

Property income (mainly interest payments) is a significant contributor to CA variation in high-income countries such as Italy, Portugal, and Greece, based on the Independent Normal-Wishart prior (and also in Spain under the Litterman-Minnesota prior). Among middle-income economies, a marked contribution of property income to the CA variation exists in Armenia and Indonesia, using both priors. As some of these countries are characterized by high net borrowing from abroad over the period of study, we attempt to verify whether external indebtedness is a viable explanation for these findings. The obtained results for the contribution of property income (from Table 6) are plotted along with values of average net external debt to GDP over the last decade for the sample.[34] The scatter plot (Figure 7) shows a positive correlation between the two.

Further, we examine several fiscal space indicators for these countries and compare them with a benchmark of countries where property income was found to contribute poorly to the CA.[35] Results are shown on Table 8. Although countries with a high contribution of property income have a lower fiscal space compared to the benchmark of countries with a low property income share, their level of external debt is not systematically superior to the one in the benchmark. On the contrary, many countries with high external debt ratios have an almost

[31]SOEs are present in various Croatian industries, including the energy sector (making up a large share of imports and exports) where they generate 70% of total revenues (see Tabak and Zildzovic (2018)). In addition, the level of subsidies is considered to be relatively high in Croatia with a value of almost 2.5% of the GDP (when the average for the EU is 1%).

[32]In Bolivia, the hydrocarbons sector (natural gas), which accounts for approximately half of the total exports, is mostly managed by SOEs. After its privatization in the 1990s, this sector was renationalized in 2006.

[33]Despite large-scale privatizations in the late 1990s, SOEs still occupy a central place in the Bulgarian economy in terms of both their size and their dominance in strategic sectors like energy and transport.

[34]Depending on data availability, used sources are the WDI and Eurostat's "Balance of Payment and other external statistics" databases.

[35]Data are taken from the database of Kose et al. (2017). We focus on seven indicators: the level of government debt and the fiscal balance over tax revenues, the share of government debt held by non-residents, the level of central government debt due in less than 12 months over GDP, the level of external debt over GDP. Two indicators reflecting market perception are included: the 5-year sovereign CDS spreads (in basis points) and the foreign currency long-term sovereign debt ratings (based on an index from 1-21, where 1 is the worst rating and 21 the best rating).

null contribution of property income to the CA (e.g., Ireland, Singapore, Hong-Kong). The main difference with the benchmark group lies in the market perception of sovereign credit risk. Countries with a high contribution of property income are in general characterized by high CDS spreads and lower ratings of the long-term sovereign debt in foreign currency. This lower perception by the market may cause a higher volatility of interest payments on external public debt. It can also be noted that the share of short-term central government debt in this group is higher, on average. On the other hand, countries with a low contribution of property income to the CA either benefit from a better market perception or have low levels of external debt (e.g., Belarus and South Africa). Hence, we conclude that property income contributes significantly to CA variation in countries with high external debt where sovereign credit risk is perceived as high by the market. This finding corroborates conclusions from Nason and Rogers (2006) on the important role played by interest rates and in particular countries' risk premium to explain CA volatility.

Finally, net foreign assets play a stronger role in CA determination than government spending (especially in Luxembourg, Belgium, and the United Kingdom). This component exhibits, on average, less weight in middle-income economies, except in Turkey, which has emerged as a significant capital investor abroad in recent decades (see Table 7). In contrast, gross fixed capital formation generally plays a minor role in explaining the CA, with the exception of Ireland, the Netherlands and Lithuania.

# 8 Conclusion

Using various statistical methods, we investigated the relationship between the CA and government expenditure. The results provide some explanations as to why the existing literature is characterized by many discrepancies. The main conclusions from this paper are as follows.

First, as opposed to predictions from several previous studies and theories, a positive shock to aggregate government spending does not always induce a negative response in the CA. The cyclicality of both fiscal policy and the CA affect this response. Particularly, this response is negative and significant only in countercyclical economies with a procyclical CA. In this particular group, the CA responds negatively to shocks to property income and (in some countries) social benefits. The response of CA is also significant but positive in countercyclical economies with a countercyclical CA, which is mainly explained by a positive response to social benefits. One reason for the significance of the relationship with social benefits is the fact that it is the only countercyclical spending component in countercyclical economies.

Second, the relationship between disaggregate government spending categories and the CA is characterized by a strong heterogeneity, which shows in the decomposition of shocks between common and idiosyncratic components. The results from a country by country analysis indicate that changes in government consumption of goods and services or in wages are not significant transmission channels of fiscal shocks to the CA. In contrast, subsidies play an important role in the CA variation of some countries such as Croatia, Austria, Spain, Bulgaria and Bolivia. In addition, property income expenditures affect the CA significantly in economies with high external debt and a high perception of sovereign credit risk by the market.

Finally, another challenge in tackling the issue fo the interaction between the CA and government spending components lies in the fact that this relationship could also differ across periods, within the same country, depending on government orientations and policies, in addition to conjunctural factors. Further scrutiny within the conditions and channels that could make this relationship vary falls beyond the scope of this paper but could be an interesting avenue for future research.

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# Tables

TABLE 1: Correlation coefficient between detrended CA and fiscal variables and cyclicality of the CA and government expenditures by group of countries

| | Correlation of the Current Account with | | Cyclicality Measures | |
|---|---|---|---|---|
| | Government Expenditures | Fiscal Balance | Current Account | Government Expenditures |
| All | -0.07 | 0.00 | -0.13 | 0.08 |
| OECD | -0.04 | -0.03 | -0.09 | 0.04 |
| non-OECD | -0.11 | 0.04 | -0.18 | 0.14 |
| Income groups | | | | |
| High Income | -0.06 | -0.01 | -0.12 | 0.07 |
| Middle-Income | -0.10 | 0.02 | -0.14 | 0.12 |
| Regions | | | | |
| East Asia | 0.00 | -0.05 | -0.13 | 0.01 |
| Eastern Europe | -0.16 | 0.09 | -0.22 | 0.09 |
| Latin America | -0.01 | -0.02 | -0.18 | 0.20 |
| North America | 0.24 | 0.01 | -0.05 | -0.27 |
| Pacific | -0.02 | -0.09 | -0.23 | 0.19 |
| South-East Asia | -0.18 | 0.05 | -0.13 | 0.14 |
| Southern Africa | -0.16 | -0.10 | -0.19 | 0.28 |
| West and Central Asia | -0.01 | 0.08 | -0.08 | 0.08 |
| Western Europe | -0.06 | -0.06 | -0.04 | 0.05 |

Notes: All variables are in real terms per capita, HP-detrended. The values in the table represent average correlation coefficients over groups (calculated on a country by country basis). Cyclicality measures correspond to the correlation coefficients with GDP.

TABLE 2: Breakdown of government expenses by category

| Government Expenses categories | All subsample | Income group | | OECD group | |
|---|---|---|---|---|---|
| | | High Income | Middle income | non-OECD | OECD |
| Compensation of employees | 27% | 27% | 29% | 30% | 26% |
| Intermediate consumption | 19% | 17% | 23% | 24% | 15% |
| Property income | 6% | 5% | 8% | 6% | 7% |
| Subsidies | 4% | 4% | 5% | 5% | 4% |
| Social benefits | 34% | 38% | 25% | 27% | 40% |
| Other expenses | 10% | 9% | 10% | 10% | 9% |

Notes: The share of each component is calculated based on the average values per country. The obtained shares per country are then averaged over groups of countries. Values in bold correspond to shares above 10%.

TABLE 3: Cyclicality measures, correlation of government expenses categories with the CA

| Government expenses | All | Income group | | OECD group | |
|---|---|---|---|---|---|
| | | High Income | Middle income | non-OECD | OECD |
| | | Correlation with GDP | | | |
| Compensation of employees | 0.17 | 0.02 | 0.51 | 0.38 | 0.03 |
| Intermediate consumption | 0.15 | 0.03 | 0.41 | 0.34 | 0.02 |
| Property Income | 0.12 | 0.05 | 0.27 | 0.15 | 0.09 |
| Subsidies | 0.02 | -0.08 | 0.27 | 0.19 | -0.09 |
| Social Benefits | 0.00 | -0.16 | 0.34 | 0.18 | -0.13 |
| Other expenses | -0.01 | -0.07 | 0.12 | 0.03 | -0.04 |
| | | Correlation with the Current Account | | | |
| Compensation of employees | 0.04 | 0.05 | 0.02 | 0.04 | 0.05 |
| Intermediate consumption | -0.03 | -0.01 | -0.09 | -0.06 | -0.01 |
| Property Income | 0.03 | 0.03 | 0.04 | 0.02 | 0.03 |
| Subsidies | 0.00 | 0.02 | -0.05 | -0.10 | 0.07 |
| Social Benefits | 0.07 | 0.08 | 0.05 | 0.07 | 0.06 |
| Other expenses | -0.05 | -0.02 | -0.10 | -0.08 | -0.02 |

Notes: The values in the table represent average correlation coefficients (calculated on a country by country basis). The underlying data correspond to cyclical components of the variables.

TABLE 4: Correlation of disaggregate government expenditures with the current account (by region)

| | Compensation of employees | Intermediate consumption | Property Income | Subsidies | Social Benefits | Other expenses |
|---|---|---|---|---|---|---|
| East Asia | 0.04 | 0.11 | -0.03 | 0.07 | 0.003 | -0.12 |
| Eastern Europe | 0.08 | -0.18 | 0.15 | -0.05 | 0.21 | -0.12 |
| Latin America | 0.04 | 0.10 | 0.03 | -0.01 | 0.07 | -0.04 |
| North America | 0.06 | 0.09 | 0.15 | -0.04 | -0.01 | 0.24 |
| Pacific | -0.02 | -0.13 | -0.28 | 0.07 | -0.09 | -0.04 |
| South-East Asia | 0.07 | 0.06 | -0.17 | -0.26 | -0.02 | -0.03 |
| Southern Africa | 0.24 | -0.09 | -0.12 | -0.17 | -0.17 | -0.35 |
| West and Central Asia | 0.02 | -0.02 | 0.00 | 0.04 | 0.11 | 0.08 |
| Western Europe | 0.03 | 0.01 | 0.01 | 0.08 | 0.02 | -0.01 |
| Total | 0.05 | -0.03 | 0.03 | 0.00 | 0.07 | -0.05 |

Notes: The values in the table represent average correlation coefficients (calculated on a country by country basis). The underlying data correspond to cyclical components of the variables.

TABLE 5: Correlation between the CA and Total government expenditures by cyclicality groups

| | Correlation of the CA with GDP | | Total Average |
|---|---|---|---|
| Fiscal cylicality group | Negative | Positive | |
| Countercyclical (group 1) | 0.26 | -0.14 | 0.02 |
| Acyclical (group 2) | 0.02 | 0.04 | 0.02 |
| Procyclical (group 3) | -0.09 | 0.09 | -0.03 |
| Total Average | 0.04 | -0.05 | 0.01 |

Notes: The table values correspond to correlation coefficients between the CA and total government expenditures for each group. Fiscal cyclicality groups (rows) are each subdivided into two groups based on the correlation sign between the CA and GDP (columns). The fiscal cyclicality group 1 includes countries of the 1st tercile in terms of measures of fiscal cyclicality defined as the correlation between cyclical components of GDP and government expenditures (corresponding to a fiscal cyclicality $< -0.09$). Group 2 is the group of countries of the 2nd tercile in terms of measures of fiscal cyclicality (fiscal cyclicality measure between -0.09 and 0.05). Group 3 is the group of countries of the 3rd tercile in terms of measures of fiscal cyclicality (fiscal cyclicality measure above 0.05).

TABLE 6: Variance decomposition of the CA (Independent Normal-Wishart prior)

a. Group 1 (countercyclical)

| Countries | pi | sub | comp | ic | sb | oth | rate | nfa | gfcf | ca |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | High-Income | | | | | |
| Austria | 0.02 | 0.27 | 0.15 | 0.09 | 0.02 | 0.05 | 0.03 | 0.17 | 0.08 | 0.13 |
| Belgium | 0.02 | 0.03 | 0.03 | 0.02 | 0.03 | 0.06 | 0.06 | 0.56 | 0.02 | 0.17 |
| Canada | 0.09 | 0.02 | 0.23 | 0.00 | 0.00 | 0.01 | 0.10 | 0.06 | 0.03 | 0.45 |
| Chile | 0.04 | 0.01 | 0.05 | 0.03 | 0.01 | 0.02 | 0.39 | 0.18 | 0.02 | 0.27 |
| Croatia | 0.02 | 0.51 | 0.05 | 0.01 | 0.03 | 0.03 | 0.02 | 0.06 | 0.15 | 0.12 |
| Denmark | 0.05 | 0.07 | 0.05 | 0.11 | 0.07 | 0.02 | 0.09 | 0.31 | 0.06 | 0.16 |
| Finland | 0.08 | 0.03 | 0.08 | 0.06 | 0.01 | 0.09 | 0.06 | 0.26 | 0.02 | 0.32 |
| France | 0.06 | 0.03 | 0.04 | 0.08 | 0.01 | 0.01 | 0.00 | 0.03 | 0.04 | 0.70 |
| Germany | 0.14 | 0.07 | 0.01 | 0.16 | 0.06 | 0.02 | 0.01 | 0.25 | 0.03 | 0.27 |
| Japan | 0.03 | 0.09 | 0.00 | 0.01 | 0.01 | 0.05 | 0.01 | 0.00 | 0.04 | 0.77 |
| Latvia | 0.02 | 0.11 | 0.02 | 0.05 | 0.03 | 0.01 | 0.24 | 0.07 | 0.05 | 0.39 |
| Luxembourg | 0.03 | 0.06 | 0.01 | 0.03 | 0.02 | 0.01 | 0.02 | 0.52 | 0.03 | 0.26 |
| Slovakia | 0.04 | 0.02 | 0.15 | 0.14 | 0.04 | 0.02 | 0.01 | 0.04 | 0.02 | 0.52 |
| South Korea | 0.10 | 0.08 | 0.02 | 0.07 | 0.01 | 0.03 | 0.21 | 0.08 | 0.03 | 0.37 |
| Sweden | 0.03 | 0.01 | 0.04 | 0.09 | 0.01 | 0.01 | 0.11 | 0.42 | 0.02 | 0.27 |
| Switzerland | 0.01 | 0.02 | 0.04 | 0.00 | 0.02 | 0.06 | 0.12 | 0.36 | 0.01 | 0.36 |
| United States | 0.02 | 0.01 | 0.02 | 0.01 | 0.16 | 0.17 | 0.13 | 0.08 | 0.10 | 0.30 |
| Average | 0.05 | 0.08 | 0.06 | 0.06 | 0.03 | 0.04 | 0.09 | 0.20 | 0.04 | 0.34 |
| Standard Deviation | 0.03 | 0.12 | 0.06 | 0.05 | 0.04 | 0.04 | 0.10 | 0.17 | 0.04 | 0.18 |

b. Group 2 (acyclical)

| Countries | pi | sub | comp | ic | sb | oth | rate | nfa | gfcf | ca |
|---|---|---|---|---|---|---|---|---|---|---|
| High-Income | | | | | | | | | | |
| Czech Republic | 0.04 | 0.08 | 0.13 | 0.14 | 0.03 | 0.05 | 0.03 | 0.32 | 0.02 | 0.16 |
| Estonia | 0.04 | 0.05 | 0.45 | 0.01 | 0.02 | 0.08 | 0.00 | 0.04 | 0.03 | 0.27 |
| Greece | 0.19 | 0.02 | 0.05 | 0.02 | 0.05 | 0.02 | 0.04 | 0.02 | 0.06 | 0.52 |
| Hong Kong | 0.00 | 0.03 | 0.01 | 0.02 | 0.01 | 0.04 | 0.09 | 0.04 | 0.01 | 0.75 |
| Italy | 0.31 | 0.04 | 0.10 | 0.02 | 0.11 | 0.02 | 0.05 | 0.09 | 0.04 | 0.22 |
| Lithuania | 0.01 | 0.05 | 0.04 | 0.12 | 0.00 | 0.02 | 0.02 | 0.07 | 0.50 | 0.18 |
| Netherlands | 0.04 | 0.02 | 0.03 | 0.01 | 0.04 | 0.04 | 0.07 | 0.24 | 0.41 | 0.12 |
| New Zealand | 0.19 | 0.00 | 0.02 | 0.00 | 0.00 | 0.05 | 0.26 | 0.23 | 0.05 | 0.20 |
| Portugal | 0.21 | 0.02 | 0.04 | 0.08 | 0.07 | 0.04 | 0.11 | 0.12 | 0.07 | 0.25 |
| Singapore | 0.01 | 0.00 | 0.01 | 0.06 | 0.01 | 0.00 | 0.04 | 0.17 | 0.17 | 0.53 |
| Slovenia | 0.07 | 0.00 | 0.18 | 0.03 | 0.02 | 0.01 | 0.03 | 0.23 | 0.07 | 0.36 |
| Spain | 0.08 | 0.17 | 0.07 | 0.05 | 0.09 | 0.03 | 0.13 | 0.09 | 0.21 | 0.10 |
| United Kingdom | 0.03 | 0.01 | 0.03 | 0.01 | 0.14 | 0.02 | 0.04 | 0.46 | 0.01 | 0.26 |
| Average | 0.09 | 0.04 | 0.09 | 0.04 | 0.04 | 0.03 | 0.07 | 0.16 | 0.13 | 0.30 |
| Standard Deviation | 0.09 | 0.04 | 0.12 | 0.04 | 0.04 | 0.02 | 0.07 | 0.12 | 0.15 | 0.18 |
| Middle-Income | | | | | | | | | | |
| Bulgaria | 0.11 | 0.16 | 0.05 | 0.14 | 0.13 | 0.02 | 0.18 | 0.01 | 0.00 | 0.20 |
| Colombia | 0.07 | 0.02 | 0.00 | 0.02 | 0.02 | 0.04 | 0.03 | 0.02 | 0.18 | 0.60 |
| Indonesia | 0.25 | 0.02 | 0.06 | 0.06 | 0.00 | 0.06 | 0.07 | 0.00 | 0.01 | 0.46 |
| Romania | 0.07 | 0.14 | 0.06 | 0.05 | 0.16 | 0.00 | 0.00 | 0.01 | 0.11 | 0.38 |
| Thailand | 0.04 | 0.01 | 0.00 | 0.04 | 0.13 | 0.00 | 0.01 | 0.17 | 0.06 | 0.55 |
| Average | 0.11 | 0.07 | 0.04 | 0.06 | 0.09 | 0.02 | 0.06 | 0.04 | 0.07 | 0.44 |
| Standard Deviation | 0.08 | 0.06 | 0.03 | 0.04 | 0.06 | 0.02 | 0.07 | 0.07 | 0.06 | 0.14 |

c. Group 3 (procyclical)

| Countries | pi | sub | comp | ic | sb | oth | rate | nfa | gfcf | ca |
|---|---|---|---|---|---|---|---|---|---|---|
| High-Income | | | | | | | | | | |
| Australia | 0.01 | 0.04 | 0.04 | 0.00 | 0.14 | 0.00 | 0.23 | 0.13 | 0.00 | 0.41 |
| Hungary | 0.15 | 0.02 | 0.04 | 0.02 | 0.27 | 0.01 | 0.03 | 0.00 | 0.01 | 0.45 |
| Iceland | 0.07 | 0.13 | 0.01 | 0.05 | 0.06 | 0.08 | 0.09 | 0.26 | 0.11 | 0.12 |
| Ireland | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.00 | 0.04 | 0.01 | 0.82 | 0.07 |
| Norway | 0.09 | 0.02 | 0.03 | 0.01 | 0.02 | 0.02 | 0.01 | 0.19 | 0.04 | 0.58 |
| Average | 0.07 | 0.04 | 0.03 | 0.02 | 0.10 | 0.02 | 0.08 | 0.12 | 0.20 | 0.33 |
| Standard Deviation | 0.05 | 0.05 | 0.01 | 0.02 | 0.09 | 0.03 | 0.08 | 0.10 | 0.31 | 0.20 |
| Middle-Income | | | | | | | | | | |
| Armenia | 0.21 | 0.04 | 0.04 | 0.05 | 0.01 | 0.00 | 0.07 | 0.25 | 0.13 | 0.20 |
| Belarus | 0.00 | 0.05 | 0.08 | 0.00 | 0.11 | 0.06 | 0.02 | 0.17 | 0.26 | 0.25 |
| Bolivia | 0.10 | 0.10 | 0.19 | 0.02 | 0.02 | 0.02 | 0.04 | 0.01 | 0.03 | 0.48 |
| Brazil | 0.12 | 0.02 | 0.02 | 0.00 | 0.03 | 0.02 | 0.36 | 0.07 | 0.18 | 0.18 |
| Georgia | 0.10 | 0.03 | 0.03 | 0.07 | 0.04 | 0.03 | 0.32 | 0.02 | 0.01 | 0.36 |
| Kazakhstan | 0.08 | 0.03 | 0.05 | 0.01 | 0.03 | 0.00 | 0.24 | 0.02 | 0.01 | 0.51 |
| Mexico | 0.02 | 0.05 | 0.02 | 0.01 | 0.03 | 0.04 | 0.04 | 0.37 | 0.02 | 0.40 |
| Moldova | 0.04 | 0.03 | 0.22 | 0.01 | 0.02 | 0.03 | 0.02 | 0.21 | 0.01 | 0.41 |
| Peru | 0.03 | 0.00 | 0.05 | 0.02 | 0.00 | 0.01 | 0.05 | 0.15 | 0.15 | 0.53 |
| South Africa | 0.00 | 0.01 | 0.01 | 0.03 | 0.03 | 0.05 | 0.05 | 0.14 | 0.04 | 0.64 |
| Turkey | 0.15 | 0.05 | 0.02 | 0.04 | 0.04 | 0.03 | 0.08 | 0.09 | 0.09 | 0.41 |
| Average | 0.08 | 0.04 | 0.07 | 0.02 | 0.03 | 0.03 | 0.12 | 0.13 | 0.08 | 0.40 |
| Standard Deviation | 0.06 | 0.02 | 0.07 | 0.02 | 0.03 | 0.02 | 0.12 | 0.11 | 0.08 | 0.14 |

Notes: Variance decomposition after 8 quarters. ca= current account balance, pi= property income , sub= subsidies, comp= compensation of employees, ic= intermediate consumption, sb= social benefits, oth= other expenditures, rate= interest rate, nfa= net foreign assets, gfcf= gross fixed capital formation. Data in domestic currency divided by GDP. Group 1 includes countries of the 1st tercile in terms of measures of fiscal cyclicality defined as the correlation between cyclical components of GDP and government expenditures (corresponding to a fiscal cyclicality $< -0.09$). Group 2 is the group of countries of the 2nd tercile in terms of measures of fiscal cyclicality (fiscal cyclicality measure between -0.09 and 0.05). Group 3 is the group of countries of the 3rd tercile in terms of measures of fiscal cyclicality (fiscal cyclicality measure above 0.05). Values above 0.2 are highlighted. Cholesky ordering: pi, sub, comp, ic, sb, oth, rate, nfa, gfcf, ca

TABLE 7: Variance decomposition of the CA by country after 8 quarters (Litterman-Minnesota prior)

a. Group 1 (countercyclical)

| Countries | pi | sub | comp | ic | sb | oth | rate | nfa | gfcf | ca |
|---|---|---|---|---|---|---|---|---|---|---|
| High-Income | | | | | | | | | | |
| Austria | 0.01 | 0.18 | 0.12 | 0.02 | 0.04 | 0.05 | 0.00 | 0.19 | 0.16 | 0.23 |
| Belgium | 0.02 | 0.04 | 0.03 | 0.03 | 0.03 | 0.04 | 0.03 | 0.44 | 0.03 | 0.32 |
| Canada | 0.08 | 0.02 | 0.02 | 0.01 | 0.02 | 0.00 | 0.03 | 0.02 | 0.00 | 0.78 |
| Chile | 0.02 | 0.01 | 0.05 | 0.02 | 0.06 | 0.00 | 0.06 | 0.02 | 0.06 | 0.69 |
| Croatia | 0.02 | 0.23 | 0.12 | 0.04 | 0.01 | 0.04 | 0.02 | 0.02 | 0.17 | 0.33 |
| Denmark | 0.05 | 0.09 | 0.06 | 0.03 | 0.07 | 0.03 | 0.03 | 0.23 | 0.08 | 0.33 |
| Finland | 0.05 | 0.07 | 0.03 | 0.02 | 0.01 | 0.04 | 0.00 | 0.20 | 0.01 | 0.58 |
| France | 0.00 | 0.01 | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.90 |
| Germany | 0.04 | 0.10 | 0.05 | 0.08 | 0.03 | 0.00 | 0.01 | 0.07 | 0.02 | 0.61 |
| Japan | 0.03 | 0.06 | 0.02 | 0.01 | 0.06 | 0.03 | 0.00 | 0.01 | 0.04 | 0.74 |
| Latvia | 0.00 | 0.08 | 0.07 | 0.01 | 0.01 | 0.02 | 0.13 | 0.18 | 0.02 | 0.49 |
| Luxembourg | 0.05 | 0.02 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.49 | 0.03 | 0.36 |
| Slovakia | 0.03 | 0.01 | 0.09 | 0.11 | 0.05 | 0.01 | 0.00 | 0.07 | 0.01 | 0.61 |
| South Korea | 0.03 | 0.05 | 0.03 | 0.01 | 0.01 | 0.01 | 0.07 | 0.08 | 0.03 | 0.70 |
| Sweden | 0.01 | 0.01 | 0.02 | 0.08 | 0.00 | 0.03 | 0.01 | 0.28 | 0.01 | 0.56 |
| Switzerland | 0.01 | 0.04 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.25 | 0.01 | 0.65 |
| United States | 0.01 | 0.02 | 0.00 | 0.01 | 0.10 | 0.18 | 0.05 | 0.09 | 0.11 | 0.43 |
| Average | 0.03 | 0.06 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 | 0.16 | 0.05 | 0.55 |
| Standard Deviation | 0.02 | 0.06 | 0.04 | 0.03 | 0.03 | 0.04 | 0.03 | 0.14 | 0.05 | 0.18 |

b. Group 2 (acyclical)

| Countries | pi | sub | comp | ic | sb | oth | rate | nfa | gfcf | ca |
|---|---|---|---|---|---|---|---|---|---|---|
| High-Income | | | | | | | | | | |
| Czech Republic | 0.08 | 0.08 | 0.11 | 0.06 | 0.01 | 0.02 | 0.00 | 0.32 | 0.03 | 0.29 |
| Estonia | 0.00 | 0.09 | 0.16 | 0.01 | 0.07 | 0.04 | 0.01 | 0.13 | 0.01 | 0.47 |
| Greece | 0.07 | 0.05 | 0.14 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.69 |
| Hong Kong | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.02 | 0.02 | 0.02 | 0.01 | 0.90 |
| Italy | 0.27 | 0.02 | 0.07 | 0.02 | 0.08 | 0.02 | 0.02 | 0.10 | 0.01 | 0.39 |
| Lithuania | 0.04 | 0.05 | 0.02 | 0.05 | 0.01 | 0.00 | 0.02 | 0.09 | 0.18 | 0.54 |
| Netherlands | 0.02 | 0.05 | 0.03 | 0.01 | 0.03 | 0.02 | 0.02 | 0.20 | 0.35 | 0.28 |
| New Zealand | 0.10 | 0.02 | 0.01 | 0.03 | 0.00 | 0.03 | 0.08 | 0.29 | 0.08 | 0.35 |
| Portugal | 0.09 | 0.05 | 0.12 | 0.01 | 0.14 | 0.02 | 0.02 | 0.04 | 0.12 | 0.38 |
| Singapore | 0.01 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 | 0.01 | 0.09 | 0.04 | 0.81 |
| Slovenia | 0.02 | 0.01 | 0.22 | 0.04 | 0.02 | 0.00 | 0.00 | 0.18 | 0.02 | 0.49 |
| Spain | 0.24 | 0.15 | 0.12 | 0.02 | 0.06 | 0.00 | 0.06 | 0.00 | 0.08 | 0.26 |
| United Kingdom | 0.00 | 0.00 | 0.04 | 0.02 | 0.05 | 0.01 | 0.02 | 0.34 | 0.00 | 0.51 |
| Average | 0.07 | 0.04 | 0.08 | 0.02 | 0.04 | 0.01 | 0.02 | 0.14 | 0.07 | 0.49 |
| Standard Deviation | 0.09 | 0.04 | 0.06 | 0.02 | 0.04 | 0.01 | 0.02 | 0.11 | 0.09 | 0.20 |
| Middle-Income | | | | | | | | | | |
| Bulgaria | 0.09 | 0.12 | 0.04 | 0.10 | 0.11 | 0.01 | 0.01 | 0.01 | 0.01 | 0.48 |
| Colombia | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.05 | 0.03 | 0.87 |
| Indonesia | 0.15 | 0.02 | 0.05 | 0.00 | 0.01 | 0.01 | 0.04 | 0.05 | 0.00 | 0.66 |
| Romania | 0.02 | 0.04 | 0.07 | 0.05 | 0.05 | 0.01 | 0.00 | 0.06 | 0.05 | 0.66 |
| Thailand | 0.04 | 0.04 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.14 | 0.05 | 0.68 |
| Average | 0.06 | 0.05 | 0.03 | 0.03 | 0.04 | 0.01 | 0.01 | 0.06 | 0.03 | 0.67 |
| Standard Deviation | 0.05 | 0.04 | 0.03 | 0.04 | 0.04 | 0.00 | 0.02 | 0.04 | 0.02 | 0.12 |

c. Group 3 (procyclical)

| Countries | pi | sub | comp | ic | sb | oth | rate | nfa | gfcf | ca |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | High-Income | | | | | |
| Australia | 0.00 | 0.02 | 0.07 | 0.01 | 0.13 | 0.04 | 0.04 | 0.05 | 0.00 | 0.64 |
| Hungary | 0.15 | 0.00 | 0.08 | 0.04 | 0.01 | 0.02 | 0.00 | 0.02 | 0.06 | 0.61 |
| Iceland | 0.13 | 0.05 | 0.01 | 0.08 | 0.04 | 0.11 | 0.07 | 0.15 | 0.10 | 0.27 |
| Ireland | 0.01 | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.00 | 0.02 | 0.72 | 0.20 |
| Norway | 0.05 | 0.01 | 0.03 | 0.01 | 0.00 | 0.04 | 0.01 | 0.25 | 0.01 | 0.59 |
| Average | 0.07 | 0.02 | 0.04 | 0.03 | 0.04 | 0.04 | 0.02 | 0.10 | 0.18 | 0.46 |
| Standard Deviation | 0.06 | 0.02 | 0.03 | 0.03 | 0.05 | 0.04 | 0.02 | 0.09 | 0.27 | 0.19 |
| | | | | | Middle-Income | | | | | |
| Armenia | 0.19 | 0.02 | 0.04 | 0.00 | 0.01 | 0.00 | 0.04 | 0.09 | 0.27 | 0.33 |
| Belarus | 0.00 | 0.07 | 0.05 | 0.00 | 0.03 | 0.01 | 0.00 | 0.16 | 0.18 | 0.49 |
| Bolivia | 0.03 | 0.13 | 0.09 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.73 |
| Brazil | 0.07 | 0.01 | 0.00 | 0.01 | 0.02 | 0.04 | 0.09 | 0.13 | 0.10 | 0.52 |
| Georgia | 0.03 | 0.01 | 0.02 | 0.08 | 0.01 | 0.00 | 0.11 | 0.02 | 0.01 | 0.71 |
| Kazakhstan | 0.08 | 0.05 | 0.01 | 0.01 | 0.01 | 0.01 | 0.07 | 0.00 | 0.00 | 0.76 |
| Mexico | 0.01 | 0.03 | 0.02 | 0.01 | 0.00 | 0.01 | 0.01 | 0.15 | 0.04 | 0.74 |
| Moldova | 0.06 | 0.02 | 0.13 | 0.01 | 0.01 | 0.00 | 0.01 | 0.05 | 0.02 | 0.69 |
| Peru | 0.04 | 0.00 | 0.03 | 0.01 | 0.01 | 0.02 | 0.01 | 0.09 | 0.10 | 0.70 |
| South Africa | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.03 | 0.03 | 0.04 | 0.01 | 0.82 |
| Turkey | 0.07 | 0.03 | 0.01 | 0.08 | 0.02 | 0.04 | 0.08 | 0.23 | 0.14 | 0.31 |
| Average | 0.05 | 0.03 | 0.04 | 0.02 | 0.01 | 0.02 | 0.04 | 0.09 | 0.08 | 0.62 |
| Standard Deviation | 0.05 | 0.04 | 0.04 | 0.03 | 0.01 | 0.01 | 0.04 | 0.07 | 0.08 | 0.17 |

Notes: ca= CA, pi= property income , sub= subsidies, comp= compensation of employees, ic= intermediate consumption, sb= social benefits, oth= other expenses, rate= interest rate, nfa= net foreign assets, gfcf= gross fixed capital formation. Group 1 is the 1st tercile in terms of fiscal cyclicality (< -0.09). Groups 2 and 3 are the 2nd and 3rd terciles, respectively. Values above 0.2 are highlighted.

TABLE 8: Average fiscal space indicators of countries with the highest/lowest contribution of property income to the CA variation by prior (over the period 2002-2020)

Independent Normal-Wishart prior

| | Debt/Tax rev | FB/Tax rev | Debt N res% | St debt | Ext debt | CDS spreads | Ext debt rating |
|---|---|---|---|---|---|---|---|
| | | Countries with highest contribution of property income to the CA | | | | | |
| Italy | 430.8 | -11.8 | 34.5 | 20.0 | 112.3 | 129.7 | 15.9 |
| Indonesia | 285.2 | -12.9 | 56.7 | 2.2 | 36.2 | 236.2 | 10.1 |
| Portugal | 446.7 | -22.2 | 57.0 | 12.8 | 205.0 | 194.9 | 14.8 |
| Armenia | 227.0 | -20.9 | NA | 2.2 | 68.4 | NA | 9.1 |
| Greece | 682.4 | -27.0 | 78.4 | 14.3 | 191.6 | 3361.3 | 10.5 |
| New Zealand | 86.1 | 0.8 | 47.7 | 4.4 | 99.0 | 50.8 | 20.0 |
| Average | 359.7 | -15.7 | 54.9 | 9.3 | 118.8 | 794.6 | 13.4 |
| | | Countries with lowest contribution of property income to the CA | | | | | |
| Belarus | 163.9 | -18.3 | NA | NA | 45.5 | NA | 6.7 |
| South Africa | 166.2 | -13.3 | 29.1 | 7.2 | 34.0 | 172.2 | 12.9 |
| Ireland | 258.7 | -18.3 | 55.2 | 3.6 | 768.4 | 148.5 | 17.7 |
| Hong-Kong | 6.0 | 10.2 | NA | 39.1 | 370.0 | 39.6 | 19.1 |
| Switzerland | 226.7 | 0.6 | 9.0 | 2.4 | 240.2 | 42.2 | 21.0 |
| Singapore | 720.4 | 23.1 | NA | 32.0 | 451.7 | NA | 21.0 |
| Average | 257.0 | -2.7 | 31.1 | 16.9 | 318.3 | 100.6 | 16.4 |

Litterman-Minnesota prior

| | Debt/Tax rev | FB/Tax rev | Debt N res% | St debt | Ext debt | CDS spreads | Ext debt rating |
|---|---|---|---|---|---|---|---|
| | | | Countries with highest contribution of property income to the CA | | | | |
| Italy | 430.8 | -11.8 | 34.5 | 20.0 | 112.3 | 129.7 | 15.9 |
| Spain | 343.2 | -20.9 | 40.4 | 15.7 | 150.4 | 110.0 | 17.4 |
| Armenia | 227.0 | -20.9 | NA | 2.2 | 68.4 | NA | 9.1 |
| Indonesia | 285.2 | -12.9 | 56.7 | 2.2 | 36.2 | 236.2 | 10.1 |
| Hungary | 275.3 | -18.2 | 45.6 | 15.2 | 119.8 | 155.6 | 13.1 |
| Iceland | 294.3 | -3.2 | NFA | 6.2 | 391.5 | 152.7 | 15.3 |
| Average | 309.3 | -14.7 | 44.3 | 10.3 | 146.5 | 156.8 | 13.5 |
| | | | Countries with lowest contribution of property income to the CA | | | | |
| Hong-Kong | 6.0 | 10.2 | NA | 39.1 | 370.0 | 39.6 | 19.1 |
| Latvia | 148.5 | -9.2 | 58.5 | 3.2 | 127.0 | 223.1 | 14.1 |
| United Kingdom | 259.5 | -19.3 | 27.5 | 7.4 | 313.9 | 41.9 | 20.4 |
| France | 314.8 | -15.8 | 52.0 | 12.9 | 185.7 | 40.6 | 20.2 |
| South Africa | 166.2 | -13.3 | 29.1 | 7.2 | 34.0 | 172.2 | 12.9 |
| Belarus | 163.9 | -18.3 | NA | NA | 45.5 | NA | 6.7 |
| Average | 176.5 | -10.9 | 41.8 | 14.0 | 179.4 | 103.5 | 15.6 |

Notes: Debt/Tax rev: General government gross debt in % of average tax revenues, FB/Tax rev: Fiscal balance in % of average tax revenues, Debt Nres%: General government debt held by nonresidents in % of total, St debt: Central government debt maturing in 12 months or less in % of GDP, Ext debt: Total external debt stocks in % of GDP, CDS spreads: 5-year sovereign CDS spreads (basis points), Ext debt rating: Foreign currency long-term sovereign debt ratings (index from 1-21, with 21 the best rating). Data source: Kose et al. (2017)

# Figures

FIGURE 1: Median response of the current account to one unit composite shocks for the whole sample with bootstrap confidence intervals based on 100 repetitions

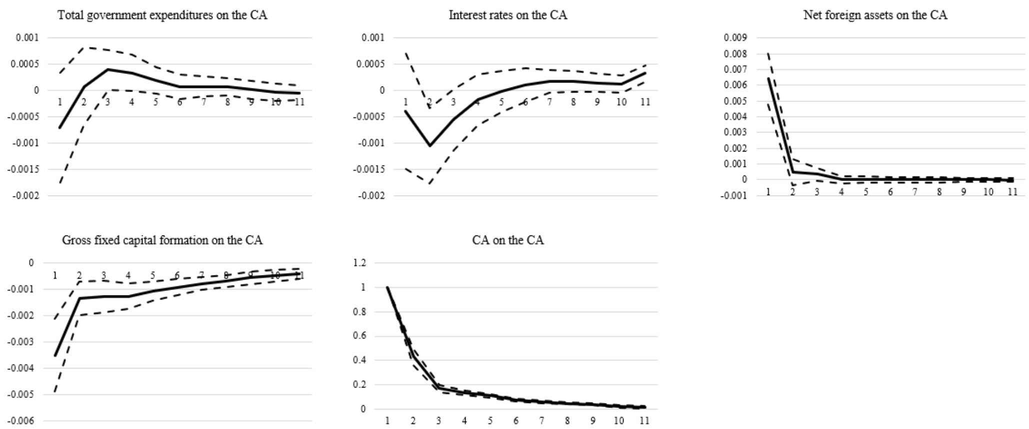


FIGURE 2: Quartile composite impulse responses of the CA to one unit shocks to the model variables for the whole sample

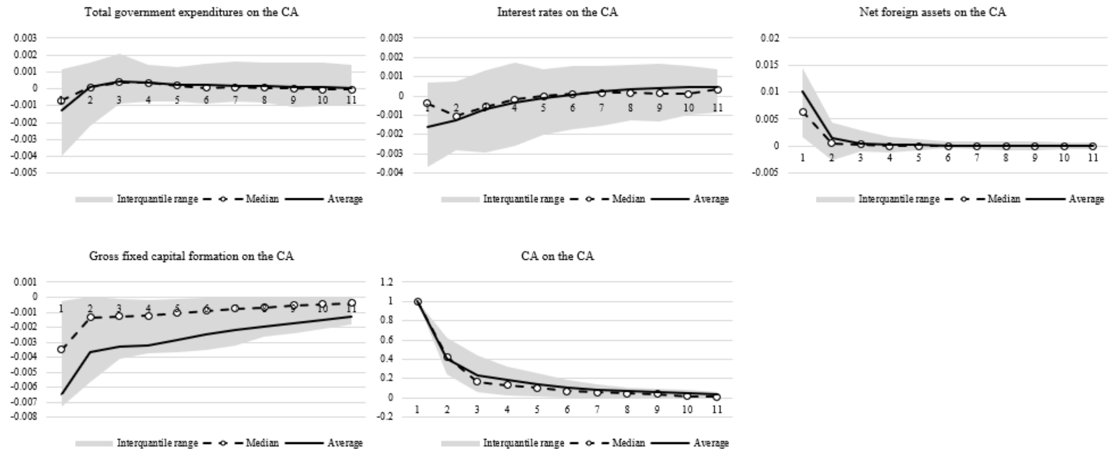
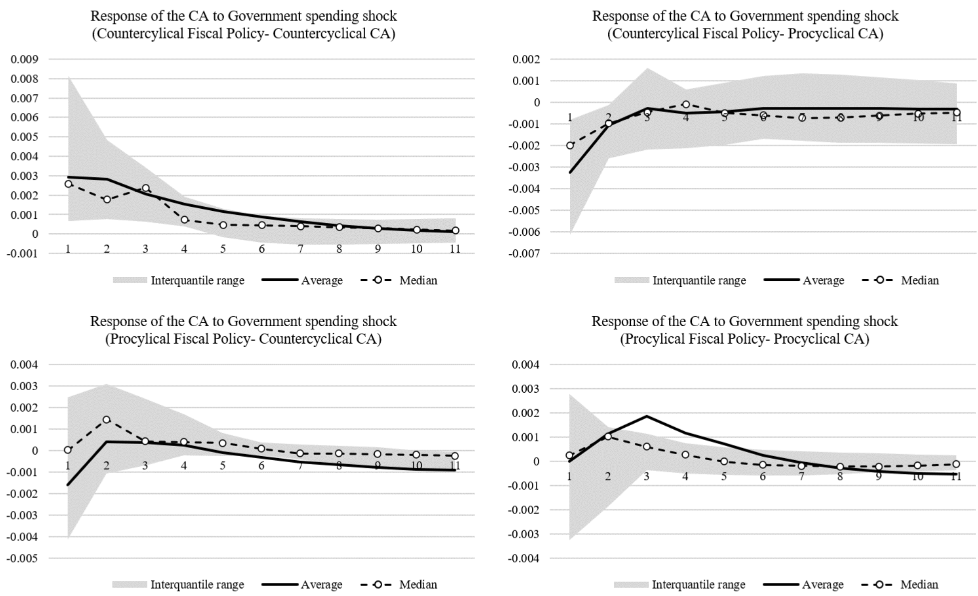



FIGURE 3: Quartile composite impulse responses of the CA to a one unit shock to total government expenditures by groups of fiscal and CA cyclicality




Notes: The correlation between cyclical components of GDP and total government spending is used as a measure for fiscal cyclicality. Countries are said to be countercyclical if they belong to the first tercile (correlation < -0.09) and procyclical if they belong to the third tercile (correlation above 0.05). To reproduce the same groups as Table 5, the CA is considered as countercylical if the correlation between its cyclical component and that of GDP is negative and procyclical otherwise.

FIGURE 4: Quartile composite impulse responses of the CA to a one unit shock to social benefits and property income in countercyclical economies

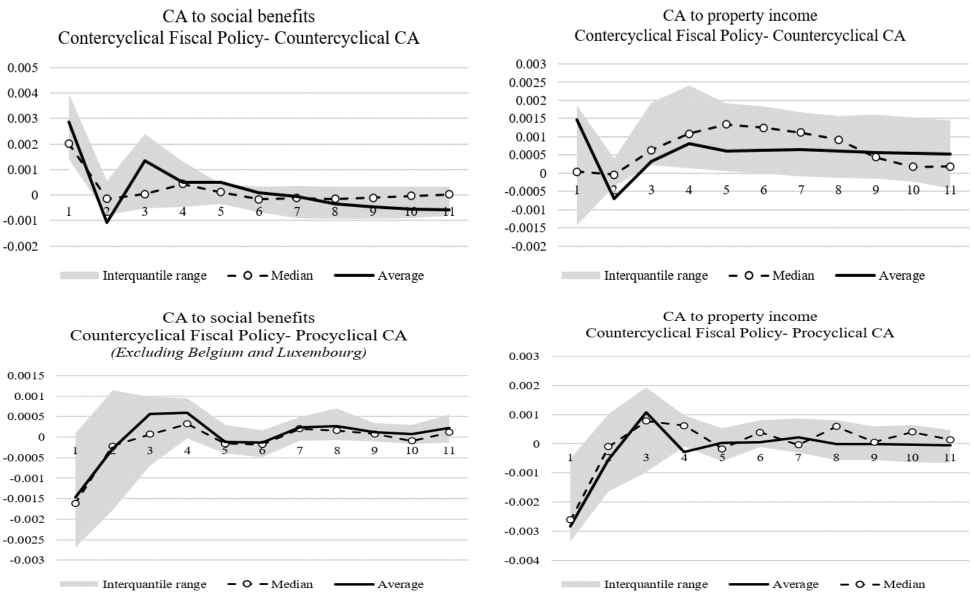
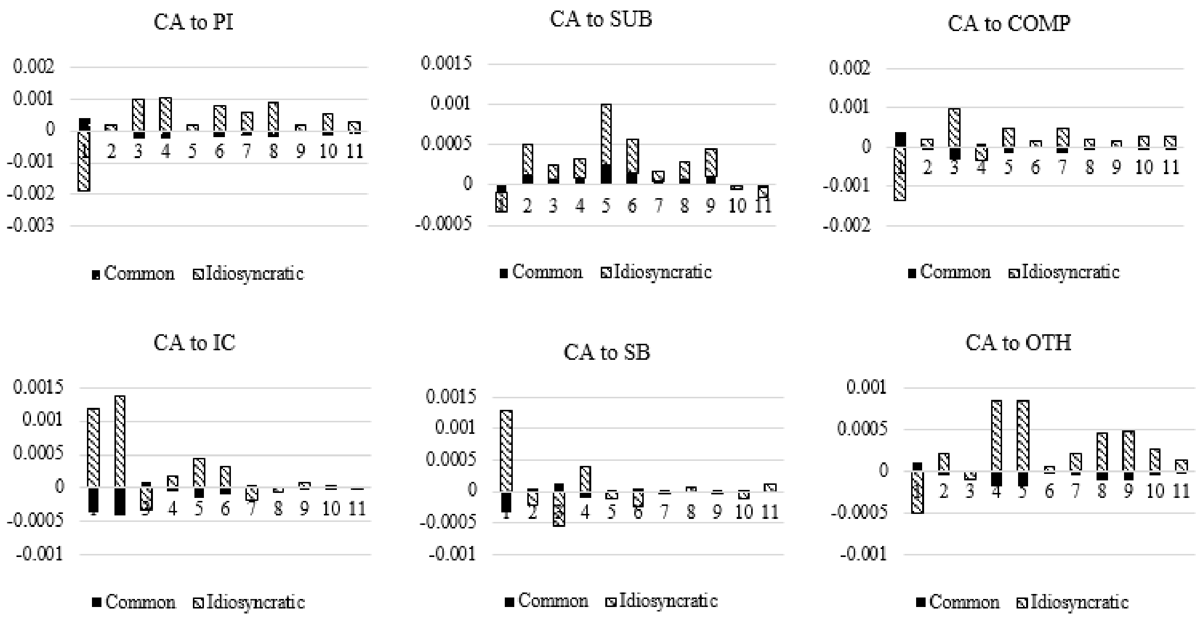
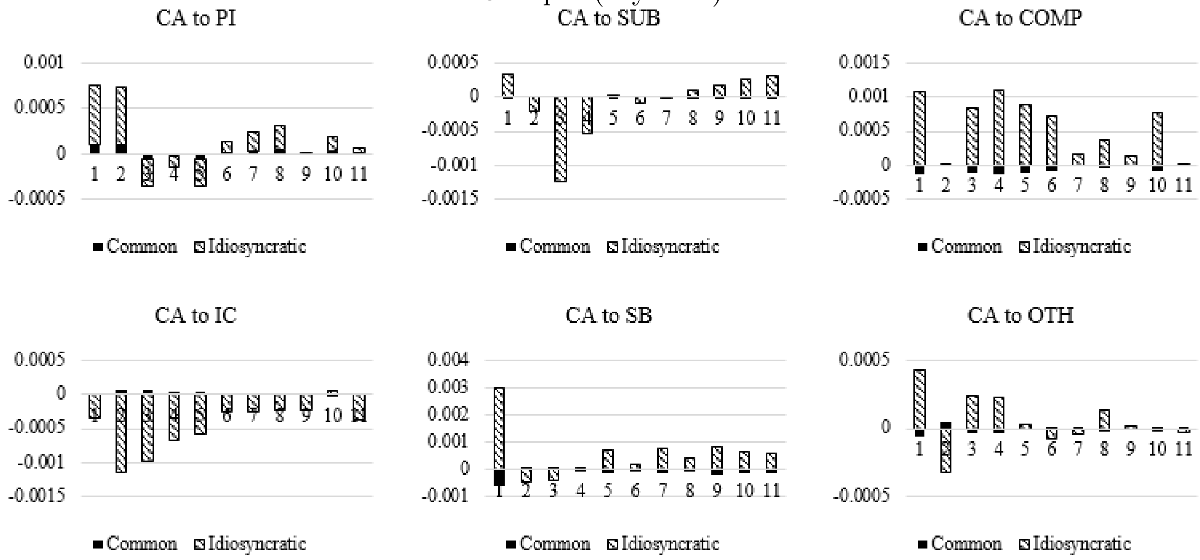



FIGURE 5: Decomposition of the median composite response of the current account to a one-unit composite shock to disaggregate government expenditures between common and idiosyncratic responses (by fiscal cyclicality group)

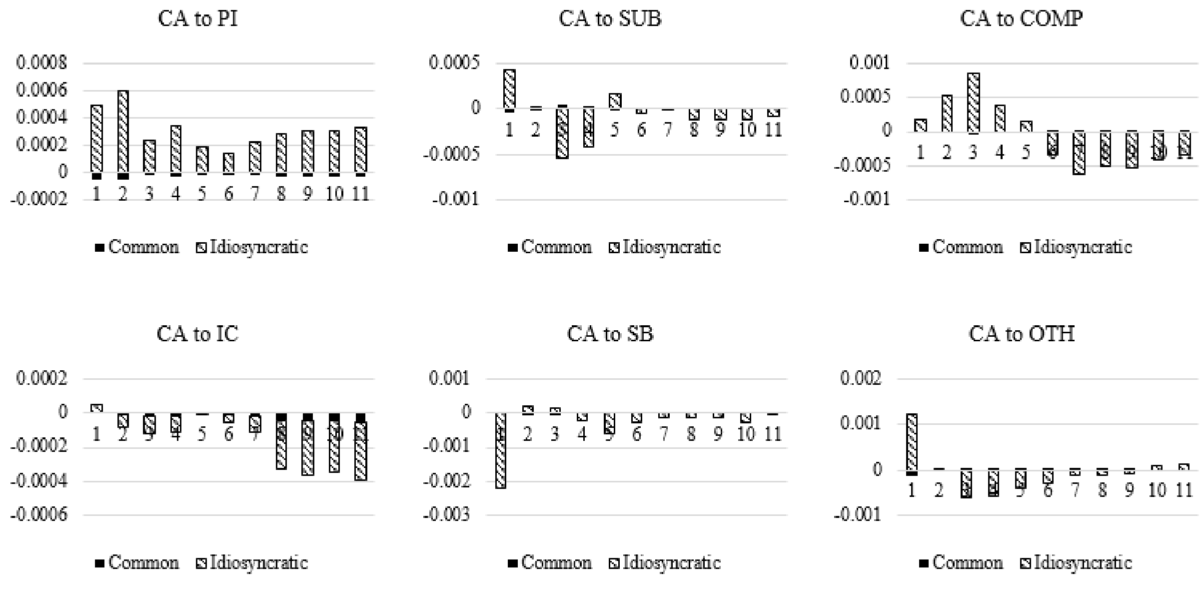
a. Group 1 (countercyclical)



b. Group 2 (acyclical)

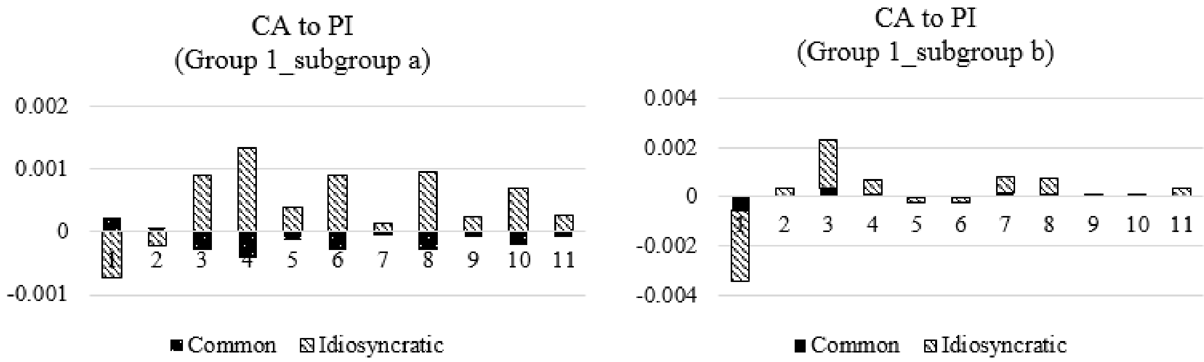



c. Group 3 (procyclical)



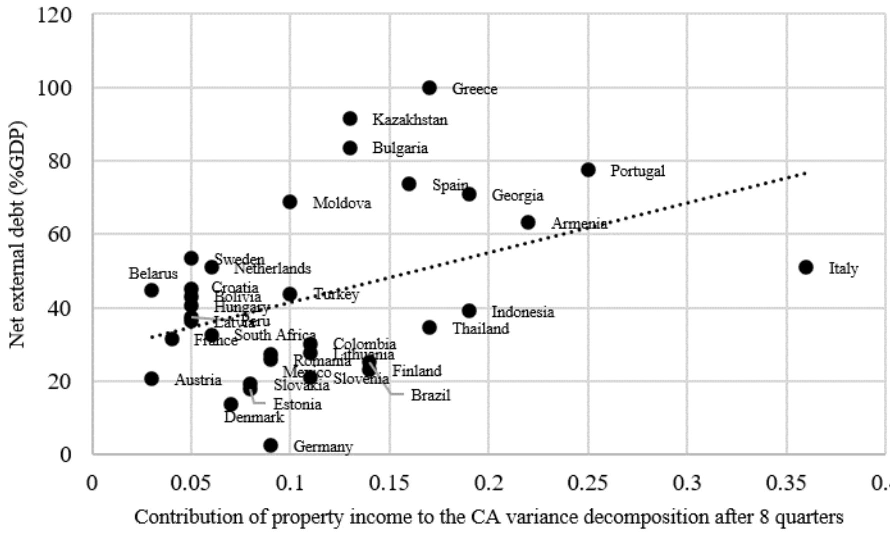

Notes: CA= current account balance, PI= property income, SUB= subsidies, COMP= Compensation of employees, IC= intermediate consumption, SB= social benefits, OTH= Other expenditures. Data in domestic currency divided by the GDP. Group 1 is the group of countries of the 1st tercile in terms of measures of fiscal cyclicality defined as the correlation between cyclical components of GDP and government expenditures (< -0.09). Group 2 is the group of countries of the 2nd tercile (between -0.09 and 0.05). Group 3 is the the 3rd tercile (fiscal cyclicality measure above 0.05).

FIGURE 6: Decomposition of the median composite response of the current account to a one unit composite shock to property income expenditures between common and idiosyncratic responses (by subgroups of group 1)




Notes: CA= ratio of current account balance/GDP, PI= property income/GDP. Group 1 contains countries of the 1st tercile in terms of fiscal cyclicality (value < -0.09). Subgroup (b) includes the countries of Croatia, Denmark, Finland, Luxembourg and Switzerland and subgroup (a) the remaining 11 countercyclical economies

FIGURE 7: Scatter plot of property income contribution to the CA variation based on results of the variance decomposition in Table 6, by level of average net external debt to GDP




Notes: Data for the X-axis are from results on Table 6. Data of Net External Debt to GDP correspond to the average of net external debt over the last ten years, available for 34 out of the 51 sample countries and calculated from the databases of the WDI and Eurostat's "Balance of Payments and other external statistics."

Appendices published electronically.

# Appendix A: The Intertemporal model of the Current Account

The intertemporal model of the current account is based on an expression for the current account that can be derived from two elements. The first element is the national income identity $Y_t = I_t + G_t + NX_t + C_t$ where the net exports $NX_t$ are the difference between the CA and income from net foreign assets $NX_t = CA_t - r_t A_t$. This identity leads to the following relation of the CA

$$CA_t = r_t A_t + Y_t - C_t - G_t - I_t \tag{6}$$

where $A_t$ is the economy's stock of net foreign claims at the end of period $(t-1)$, $r_t$ is the net interest rate paid on these assets, $Y_t$ is the net domestic product, $G_t$ is government consumption, and $I_t$ is net investment.

By definition, it is also established that $CA_t = A_{t+1} - A_t$. Forward iteration of this expression using (6) and the transversality condition on external debt lead to

$$\sum_{s=t}^{\infty} R_{t,s} C_s = (1+r_t) A_t + \sum_{s=t}^{\infty} R_{t,s} (Y_s - G_s - I_s) \tag{7}$$

where $R_{t,s}$ is defined as $R_{t,s} = \frac{1}{\prod_{v=t+1}^{s}(1+r_v)}$ with $R_{t,t} = 1$

The second element is the permanent income hypothesis implying the permanent level of consumption is determined by the permanent levels of the net domestic product, investment, and government expenditures. This relationship can be inferred from the optimality condition $u'(C_t) = \beta (1+r_{t+1}) u'(C_{t+1})$ , based on the assumption of intertemporal separability of consumer's utility. For $\sigma > 0$ representing the elasticity of intertemporal substitution and $u(C) = \frac{C^{1-1/\sigma}-1}{1-1/\sigma}$, this condition implies that $C_{t+1} = \beta^{\sigma}(1+r_{t+1})^{\sigma} C_t$ where $\beta \in (0,1)$. Using this expression in (7) leads to (8).

$$C_t = \frac{(1+r_t) A_t + \sum\limits_{s=t}^{\infty} R_{t,s} (Y_s - G_s - I_s)}{\sum_{s=t}^{\infty} R_{t,s} \left( \beta^{s-t} / R_{t,s} \right)^{\sigma}} \tag{8}$$

Then defining the permanent level of a given variable $X$ as $\tilde{X}_t = \frac{\sum_{s=t}^{\infty} R_{t,s} X_s}{\sum_{s=t}^{\infty} R_{t,s}}$, and using the fact that $\frac{1+r_t}{\sum_{s=t}^{\infty} R_{t,s}} = \tilde{r}_t$ since $\sum_{s=t+1}^{\infty} R_{t,s} r_s = 1$, the following expression for the CA is obtained

$$\begin{aligned} CA_t &= (r_t - \tilde{r}_t) A_t + (Y_t - \tilde{Y}_t) - (G_t - \tilde{G}_t) - (I_t - \tilde{I}_t) \\ &+ \left[ 1 - \frac{1}{(\widetilde{\beta/R})^{\sigma}} \right] \left( \tilde{r}_t A_t + \tilde{Y}_t - \tilde{G}_t - \tilde{I}_t \right) \end{aligned} \tag{9}$$

Where the letters with a tilde represent the permanent level of the variables and $(\widetilde{\beta/R})^{\sigma}$ is the weighted average ratio of the $(s-t)$ period's subjective and market discount factors

$$\widetilde{(\beta/R)}^{\sigma} \equiv \frac{\sum_{s=t}^{\infty} R_{t,s}\left(\beta^{s-t}/R_{t,s}\right)^{\sigma}}{\sum_{s=t}^{\infty} R_{t,s}} \tag{10}$$

# Appendix B: The Present Value Model of the Current Account

The present value model of the CA is as follows

$$CA_t = -\sum_{i=1}^{\infty}\left(\frac{1}{1+r}\right)^{i} E_t \Delta NO_{t+i} \tag{11}$$

where the net output $NO_t$ is given by $NO_t = Y_t - I_t - G_t$ and $\Delta NO_{t+i} = NO_{t+i} - NO_{t+i-1}$, with $Y_t, I_t, G_t$ representing output, investment, and government spending, respectively. This model can be derived from the total income identity, expressed as

$$Y_t = I_t + G_t + NX_t + rA_t + r(1+r)^{-1}\sum_{i=0}^{\infty}(1+r)^{-i}E_t\left\{Y_{t+i} - I_{t+i} - G_{t+i}\right\} \tag{12}$$

where the net exports $NX_t$ are the difference between the CA and income from net foreign assets $NX_t = CA_t - rA_t$ and consumption has been replaced by the following equation[36]

$$\tilde{C}_t = rA_t + r(1+r)^{-1}\sum_{i=0}^{\infty}(1+r)^{-i}E_t\left\{Y_{t+i} - I_{t+i} - G_{t+i}\right\}$$

An expression for the CA can be inferred from (12)

$$CA_t = NO_t - r(1+r)^{-1}\sum_{i=0}^{\infty}\left(\frac{1}{1+r}\right)^{i} E_t NO_{t+i}$$

Finally, using the fact that $r(1+r)^{-1}\left(\frac{1}{1+r}\right)^{i} NO_{t+i} = \frac{NO_{t+i}(1+r) - NO_{t+i}}{(1+r)^{i+1}} = \frac{NO_{t+i}}{(1+r)^{i}} - \frac{NO_{t+i}}{(1+r)^{i+1}}$, equation (11) is obtained.

To empirically verify this model, the approach of Campbell and Shiller (1987) and Campbell (1987) is usually applied. It consists in estimating the following VAR model and then testing some restrictions

$$Z_t = AZ_{t-1} + \mu_t \tag{13}$$

Where $Z_t = [\Delta NO_t, CA_t]'$, A is the companion matrix and $\mu_t$ a vector of mean zero and homoscedastic errors. The forecast of $Z_{t+i}$ for any period $i$ can therefore be expressed as

$$E_t Z_{t+i} = A^{i} Z_t \tag{14}$$

This can be generalized to VAR models of $p$ higher orders where $Z_t$ would be a $2p$ dimensional vector such that $Z_t = [\Delta NO_t, \ldots, \Delta NO_{t-p+1}, CA_t, \ldots, CA_{t-p+1}]'$. The restrictions on the

[36] See Nason and Rogers (2006).

VAR model can be obtained by noting that the expression (11) can be rewritten as

$$g' Z_t = -\sum_{i=1}^{\infty} \left(\frac{1}{1+r}\right)^i h' A^i Z_t \tag{15}$$

Where $g'$ and $h'$ are row vectors with $2p$ elements, all of which are zero except for the $p+1^{st}$ element of $g'$ and the first element of $h'$ which are unity. This last expression implies that

$$g' = -h' A \left[I - \frac{A}{(1+r)}\right]^{-1} \frac{1}{(1+r)} \tag{16}$$

A first test of the present value model consists in regressing $CA_{f,t}$ (estimated through the VAR system) on the vector $Z_t$ and verifying the $p+1^{st}$ coefficient or in performing a $\chi^2$ test for the values of $g'$. Another test consists in verifying the implied restrictions on the individual coefficients of the loading matrix $A$ and which can be obtained by multiplying (16) by $\left[I - \frac{A}{(1+r)}\right]$

$$g' \left[I - \frac{A}{(1+r)}\right] = -h' A \frac{1}{(1+r)} \tag{17}$$

As shown in Campbell (1987), if it is assumed that the matrix A corresponds to

$$A = \begin{bmatrix} a_1 & \ldots\ldots & a_p & b_1 & \ldots\ldots & b_p \\ . & . & . & . & . & . \\ . & . & . & . & . & . \\ c_1 & \ldots\ldots & c_p & d_1 & \ldots\ldots & d_p \\ . & . & . & . & . & . \\ . & . & . & . & . & . \end{bmatrix}$$

Then the condition (17) is equivalent to the following restrictions on individual coefficients $a_1 = c_1$, ..., $a_p = c_p$, $d_1 - b_1 = (1+r)$, $b_2 = d_2$,..., $b_p = d_p$. To test those restrictions, it is possible to subtract the $\Delta NO_t$ equation in the VAR model from the $CA_t$ equation to get

$$\begin{aligned} CA_t - \Delta NO_t = (c_1 - a_1)\,\Delta NO_{t-1} + \ldots + (c_p - a_p)\,\Delta NO_{t-p} + (d_1 - b_1)\,CA_{t-1} \\ + (d_2 - b_2)\,CA_{t-2} + \ldots + (d_p - b_p)\,CA_{t-p} + u_{2t} - u_{1t} \end{aligned}$$

In that case, it is possible to use a single-equation regression to verify that

$$CA_t - \Delta NO_t - (1+r)\,CA_{t-1} = u_{2t} - u_{1t}$$

Meaning the left-hand side (usually expressed with a script notation as $\mathcal{CA}_t$) cannot be predicted with lagged $\Delta NO_t$ and $CA_t$. This can be checked using a Wald test.

## Appendix C: Data description

Data have been extracted from the following sources, in millions of domestic currencies, used in real terms and divided by the population (population data from the IFS)[37]

[37] For countries where disaggregate spending data are available on an annual basis, temporal disaggregation is performed through Eurostat's JDemetra+ software(See the link http://ec.europa.eu/eurostat/cros/con-

tent/download_en (replacing old Ecotrim)). The quarterly values are estimated using quarterly GDP as the higher frequency indicator series, based on the Chow-Lin method (Chow and Lin (1971)) that assumes the quarterly residuals follow an autoregressive process of order 1 (AR1).

| Variable | Data source | Adjustment |
|---|---|---|
| Gross Domestic Product | Data in real terms from the IMF's International Financial Statistics (IFS) | Gaps completed using nominal series and GDP deflator from annual series |
| Net Foreign Assets | IMF- Balance of Payments and International Investment Position database | |
| Current account balance | Data in nominal terms from Datastream (DS mnemonic = "country code" & CURBALA) | Deflated using calculated GDP deflator. For data only in US dollars, other variables converted to US dollars |
| General government consumption expenditure | Data in real terms from Datastream (DS mnemonic: "country code" & XGCSA.D, if absent, use of "country code" & XGCSA.C) | |
| Gross fixed capital formation | Data in current prices from Datastream ("country code" & GFCF.C), or from the IFS | Converted to real terms using a deflator calculated based on annual nominal and real series from IFS |
| Private consumption | Data in current prices from Datastream ("country code" & CNPER.D), or from the IFS | |
| Short-term interest rates | Short-term interest rates from IFS (IMF) | Gaps completed from Datastream ("country code" & OCFISTR or "country code" & XRCB..R) |
| Fiscal balance | Data in current prices from Datastream ("country code" & GOVBALA) or from the IFS | Deflated using calculated GDP deflator |
| Disaggregate fiscal data (European Union) | Government Finance Statistics (Eurostat) http://ec.europa.eu/eurostat/data /database | Deflator calculated from real Government expenditures series and nominal series extracted from IFS (when unavailable, annual data used) |
| Disaggregate fiscal data (non-EU countries) | Government Finance Statistics (IMF), "Expense" dataset http://data.imf.org/?sk= 3C005430-5FDC-4A07-9474-64D64F1FB3DC | Deflator calculated from real Government consumption expenditures series and nominal series extracted from IFS (if unavailable, annual data used) |

# Appendix D: Description of government expenses categories

Government expenditure comprises several components described in detail in the ESA 2010 manual (Chapters 3 and 4). ESA codes and definitions of the main categories used in this paper are as follows.

- P2 Intermediate consumption: intermediate consumption comprises goods and services consumed as inputs by a process of production, excluding fixed assets whose consumption is recorded as consumption of fixed capital. The goods and services are either transformed or used by the production process.

- D1 Compensation of employees: defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter during an accounting period. It includes wages and salaries, in addition to social contributions such as pensions.

- D3 Subsidies, payable: current unrequited payments which general government or the institutions of the European Union make to resident producers.

- D4 Property income, payable: property income (D.4) accrues when the owners of financial assets and natural resources put them at the disposal of other institutional units. The income payable for the use of financial assets is called investment income (e.g., interests and dividends), whereas that payable for the use of a natural resource is called rent. Property income is the sum of investment income and rent.

- Social benefits: social benefits include the following:
  - D62 Social benefits other than social transfers in kind, made up of ”Social security benefits in cash”, ”Other social insurance benefits” and ”Social assistance benefits in cash”
  - D632 Social transfers in kind, purchased market production

- Other expenses: include other government spending categories listed in the ESA manual and not elsewhere classified, namely: taxes (D29 and D5), other current transfers (D7), adjustment for the change in pension entitlements (D8), capital transfers (D9) and acquisitions less disposals of non-produced assets.

# Appendix E: Methodology for conducting heterogeneous structural panel VAR analysis

We briefly describe Pedroni (2013) approach in the following. Consider a panel composed of $i = 1, \ldots, N$ individual members, each of which comprises an $M \times 1$ vector of observed endogenous variables $y_{it}$. The data are assumed to be observed over $T$ time periods ($t = 1, ..., T$) for each member and used after de-meaning, where the $M \times 1$ vector of de-meaned data is $z_{it} = y_{it} - \bar{y}_i$. Structural composite white noise shocks $\epsilon_{it}$ may be cross-sectionally dependent as expressed by the relation $\epsilon_{it} = \Lambda_i \bar{\epsilon}_t + \tilde{\epsilon}_{it}$, where $\bar{\epsilon}_t$ and $\tilde{\epsilon}_{it}$ represent common white noise shocks shared by all members and member-specific idiosyncratic white noise shocks, respectively, and $\Lambda_i$ is an $M \times M$ diagonal matrix with the loading coefficients. The two types of shocks are assumed to be orthogonal to each other. The moving average representation of the model is as follows: $R_i(L) z_{it} = \mu_{it}$, where $R_i(L) = I - \sum_{j=1}^{P_i} R_{ij} L^j$, with $P_i$ the lag truncation value, which can differ from one cross section to the other. The associated structural form model is $z_{it} = A_i(L) \epsilon_{it}$ or $B_i(L) z_{it} = \epsilon_{it}$, where $B_i(L) = A_i(L)^{-1}$. Short-run restrictions can be imposed on the $B_i(0)$ matrix. In the special case of recursive restrictions (used in the present study), this is equivalent to the Cholesky orthogonalization.

The first step of the methodology is to estimate the reduced-form VAR through ordinary least squares. Initially, the model is estimated separately for each cross section. Subsequently, to capture the common dynamics, the $M \times 1$ vector of common time effects $\bar{z}_t = N_t^{-1} \sum_{i=1}^{N_t} z_{it}$ is calculated and the corresponding reduced-form VAR model $\bar{R}(L) \bar{z}_t = \bar{\mu}_t$is estimated. Thus, the appropriate identifying restrictions are used to obtain the structural shock estimates $\epsilon_{it} = B_i(L) R_i(L)^{-1} \mu_{it}$ and $\bar{\epsilon}_t = \bar{B}(L) \bar{R}(L)^{-1} \bar{\mu}_t$. Moreover, to obtain the elements of the loadings matrix $\Lambda_i$, $N \times M$ ordinary least squares regressions of $\epsilon_{it}$ on $\bar{\epsilon}_t$ are run, based on the relation $\epsilon_{it} = \Lambda_i \bar{\epsilon}_t + \tilde{\epsilon}_{it}$.

In the final step, the quartile impulse responses are estimated with the decomposition of responses between those to common and those to idiosyncratic shocks. The composite impulse response functions calculated from the individual structural VAR estimation can be decomposed into common and idiosyncratic shocks as follows: First, a re-scaling of the responses to idiosyncratic shocks is required, based on the following argument: The variances for the structural shocks can be expressed as $E\left[\epsilon_{it}\epsilon_{it}'\right] = E\left[\left(\Lambda_i\bar{\epsilon}_t + \tilde{\epsilon}_{it}\right)\left(\Lambda_i\bar{\epsilon}_t + \tilde{\epsilon}_{it}\right)'\right] = \Omega_{i,\epsilon} = \Lambda_i\Omega_{i,\bar{\epsilon}}\Lambda_i' + \Omega_{i,\tilde{\epsilon}}$. Setting $\Omega_{i,\bar{\epsilon}} = \Omega_{i,\epsilon} = I$, implies $\Omega_{i,\tilde{\epsilon}} = I - \Lambda_i\Lambda_i{}'$. This means responses to common shocks for unity-sized shocks would correspond to responses to idiosyncratic shocks for shocks of size $1 - \Lambda(m,m)^2$, where $m = 1, ..., M$ (since $\Lambda_i$ is diagonal). To perform the re-scaling, the expression for composite structural shocks can be rewritten as $\epsilon_{it} = \Lambda_i\bar{\epsilon}_t + (I - \Lambda_i\Lambda_i')^{1/2}\tilde{\epsilon}_{it}^*$. Finally, this re-scaled form can be used to decompose the impulse responses such that $A_i(L)\,\epsilon_{it} = A_i(L)\left(\Lambda_i\bar{\epsilon}_t + (I - \Lambda_i\Lambda_i')^{\frac{1}{2}}\tilde{\epsilon}_{it}^*\right)$, leading to the decomposition $A_i(L) = \bar{A}_i(L) + \tilde{A}_i(L)$ where $\bar{A}_i(L) = A_i(L)\,\Lambda_i$ and $\tilde{A}_i(L) = A_i(L)\,(I - \Lambda_i\Lambda_i')^{\frac{1}{2}} = A_i(L) - \bar{A}_i(L)$. The sample distribution of estimated responses can be used to describe the properties of the sample (e.g. median, interquartile range used as confidence intervals).

## Appendix F: Methodology for estimating individual Bayesian VAR models by country

The time-series Bayesian VAR approach used in this paper is based on independent normal-Wishart priors with Gibbs sampling, from which the variance decomposition is derived. The independent normal-Wishart priors set for $\beta$ and $\Sigma$ (respectively the vector of parameters and the residual variance-covariance matrix) are

$\beta \sim N(\beta_0, V_0)$

$\Sigma \sim \mathrm{IW}(S_0, \alpha_0)$

$\beta_0$ is a vector of approximately all zeros except the diagonal elements corresponding to coefficients of a variable's first own lag (hyper-parameter $\mu_1$) that can be set to a different value, usually 1 for a random walk or less for an AR(1) process. In the present case, $\mu_1$ is considered equal to unity. The conditional posterior distributions for the dataset $y$ are

$(\beta|y, \Sigma) \sim \mathrm{N}\left(\bar{\beta}, \bar{V}\right)$

$(\Sigma|y, \beta) \sim \mathrm{IW}\left(\bar{S}, \bar{\alpha}\right)$

where

$\bar{V} = \left(V_0{}^{-1} + \left(\hat{\Sigma}^{-1} \otimes (X'X)^{-1}\right)\right)^{-1}$

$\bar{\beta} = \bar{V}\left(V_0{}^{-1}\beta_0 + \left(\hat{\Sigma}^{-1} \otimes X'\right)y\right)$

$\bar{S} = S_0 + E'E$

$\bar{\alpha} = \alpha_0 + T$

with $S_0^{-1} = \lambda_1 I$, $V_0{}^{-1} = \lambda_2 I$, and $\alpha_0 = \lambda_3$.

The following hyperparameters are used: $\lambda_1 = 0.1$, $\lambda_2 = 0.1$ and the prior degrees of freedom $\lambda_3 = 11$ (the model includes 10 endogenous variables). $E$ corresponds to the residual matrix with $E = Y - XB$, $\beta = vec(B)$, $y = vec(Y)$ and $X$ being the regressors matrix. The scale matrix $\bar{S}$ and the degrees of freedom $\bar{\alpha}$ are calculated based on prior error variance of endogenous variables $S_0$ and prior degrees of freedom of the error-term $\alpha_0$. Based on an initial estimate of $\Sigma$, a Gibb's sampler is used to obtain properties of the unconditional posteriors with 100 000 iterations and a ratio of 0.1 burn-in draws. As a robustness check, the same model is re-estimated using the Litterman-Minnesota prior based on hyper-parameters $\lambda_1 = 0.1$, $\lambda_2 = 0.99$ , $\lambda_3 = 1$ and the determination of the residual variance-covariance matrix from univariate autoregressive estimates.

# Appendix G: The CA and disaggregate government spending in countercyclical economies

First, some descriptive figures on the group of countercyclical economies are extracted (displayed in the following tables). From Table (a), it appears that countries with a procyclical CA tend to have a positive CA balance. The ratio of total government spending over GDP is on average between 0.30 and 0.55 for all countercyclical economies. In addition, the major contributors to total government spending in the group appear to be social benefits and the compensation of employees. In Table (b), the most countercyclical spending components are highlighted for each country. The categories of spending with the highest negative correlation values differ between countries. Nevertheless, it is evident that social benefits are the only category of spending that is always countercyclical (the only exception is South Korea). Compensation of employees is, in contrast, more often countercyclical in the group with a countercyclical CA than in the one with a procyclical CA.

Table (a): Average values of the CA, total Government spending and shares of spending components from total spending

| Countries | CA/ GDP | Gov. Spend./ GDP | Share from total spending | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | COMP | IC | PI | SUB | SB | OTH |
| Countercyclical economies with countercyclical CA | | | | | | | | |
| Chile | -0.003 | 0.22 | 0.28 | 0.13 | 0.03 | 0.18 | 0.23 | 0.15 |
| France | -0.004 | 0.52 | 0.25 | 0.10 | 0.05 | 0.04 | 0.48 | 0.09 |
| Latvia | -0.054 | 0.29 | 0.30 | 0.19 | 0.03 | 0.03 | 0.33 | 0.10 |
| Slovakia | -0.044 | 0.37 | 0.22 | 0.15 | 0.05 | 0.03 | 0.48 | 0.07 |
| South Korea | 0.023 | 0.19 | 0.23 | 0.18 | 0.05 | 0.10 | 0.26 | 0.18 |
| Switzerland | 0.102 | 0.30 | 0.24 | 0.15 | 0.03 | 0.10 | 0.37 | 0.11 |
| United States | -0.035 | 0.33 | 0.28 | 0.17 | 0.12 | 0.01 | 0.40 | 0.02 |
| Average | -0.002 | 0.32 | 0.26 | 0.15 | 0.05 | 0.07 | 0.36 | 0.10 |
| Countercyclical economies with procyclical CA | | | | | | | | |
| Austria | 0.024 | 0.49 | 0.22 | 0.13 | 0.06 | 0.03 | 0.46 | 0.10 |
| Belgium | 0.017 | 0.53 | 0.24 | 0.08 | 0.08 | 0.06 | 0.47 | 0.07 |
| Canada | -0.013 | 0.35 | 0.32 | 0.23 | 0.11 | 0.03 | 0.25 | 0.06 |
| Croatia | -0.006 | 0.44 | 0.27 | 0.18 | 0.06 | 0.05 | 0.37 | 0.08 |
| Denmark | 0.053 | 0.51 | 0.32 | 0.17 | 0.04 | 0.04 | 0.36 | 0.07 |
| Finland | 0.014 | 0.50 | 0.28 | 0.20 | 0.03 | 0.03 | 0.40 | 0.06 |
| Germany | 0.060 | 0.44 | 0.18 | 0.11 | 0.05 | 0.02 | 0.56 | 0.08 |
| Japan | 0.030 | 0.35 | 0.17 | 0.09 | 0.07 | 0.02 | 0.58 | 0.07 |
| Luxembourg | 0.072 | 0.33 | 0.23 | 0.09 | 0.01 | 0.03 | 0.53 | 0.11 |
| Sweden | 0.054 | 0.51 | 0.27 | 0.18 | 0.03 | 0.03 | 0.37 | 0.12 |
| Average | 0.03 | 0.44 | 0.25 | 0.14 | 0.05 | 0.04 | 0.43 | 0.08 |

Table (b): Cyclicality measures by variable

| Countries | CA | Gov. Spend. | COMP | IC | PI | SUB | SB | OTH |
|---|---|---|---|---|---|---|---|---|
| Countercyclical economies with countercyclical CA | | | | | | | | |
| Chile | -0.34 | -0.42 | -0.13 | 0.14 | 0.13 | 0.10 | -0.04 | -0.45 |
| France | -0.14 | -0.13 | -0.14 | 0.05 | 0.31 | -0.43 | -0.16 | -0.06 |
| Latvia | -0.77 | -0.18 | 0.35 | 0.05 | -0.60 | 0.08 | -0.50 | 0.02 |
| Slovakia | -0.28 | -0.20 | -0.04 | 0.02 | -0.07 | 0.07 | -0.17 | -0.17 |
| South Korea | -0.47 | -0.23 | -0.19 | -0.35 | 0.37 | -0.23 | 0.20 | 0.00 |
| Switzerland | -0.16 | -0.15 | -0.58 | -0.38 | 0.50 | -0.48 | -0.57 | 0.38 |
| United States | -0.68 | -0.67 | -0.55 | -0.42 | -0.02 | -0.22 | -0.63 | -0.68 |
| Average | -0.41 | -0.28 | -0.18 | -0.13 | 0.09 | -0.16 | -0.27 | -0.14 |
| Countercyclical economies with procyclical CA | | | | | | | | |
| Austria | 0.09 | -0.12 | -0.09 | 0.04 | 0.12 | 0.00 | -0.07 | -0.08 |
| Belgium | 0.06 | -0.13 | 0.11 | -0.16 | 0.20 | 0.37 | -0.15 | -0.13 |
| Canada | 0.65 | -0.36 | -0.44 | -0.07 | 0.53 | -0.09 | -0.72 | -0.13 |
| Croatia | 0.81 | -0.25 | 0.37 | 0.56 | -0.39 | -0.56 | -0.12 | -0.21 |
| Denmark | 0.01 | -0.22 | -0.26 | -0.08 | -0.35 | -0.26 | -0.17 | 0.00 |
| Finland | 0.11 | -0.29 | -0.04 | 0.06 | 0.32 | 0.10 | -0.33 | -0.13 |
| Germany | 0.30 | -0.23 | -0.11 | 0.05 | 0.32 | -0.42 | -0.19 | -0.07 |
| Japan | 0.25 | -0.73 | 0.01 | -0.14 | 0.18 | -0.69 | -0.38 | -0.64 |
| Luxembourg | 0.11 | -0.22 | 0.08 | 0.06 | 0.01 | -0.03 | -0.19 | -0.04 |
| Sweden | 0.36 | -0.14 | 0.02 | -0.02 | 0.19 | 0.00 | -0.26 | -0.08 |
| Average | 0.28 | -0.27 | -0.03 | 0.03 | 0.11 | -0.16 | -0.26 | -0.15 |

Notes: CA= current account balance, Gov. Spend.= Total Government spending, COMP= Compensation of employees, IC= intermediate consumption, PI= property income, SUB= subsidies, SB= social benefits, OTH= Other expenditures. Cyclicality measures correspond to the correlation coefficients between cyclical components of the variables and those of GDP.