

# Accounting for current account changes: what matters is spending, not income

Nikolas A. Müller-Plantenberg  
Universidad Autónoma de Madrid

## **Abstract**

*The intertemporal approach to the current account holds that changes in the current account balance must stem from changes in national income, rather than from changes in aggregate consumption, which is considered smooth. This paper calculates in an exact and intuitive way and for a total of 155 countries to what extent movements of the current account are accounted for by its national income and national spending components. It shows that, contrary to the intertemporal approach, the current account balance is mainly driven by changes in expenditure, not changes in income. What is more, deteriorations of the current account occur during economic booms when national income expands fast, not vice versa as the intertemporal approach suggests. The empirical findings thus support the variable-expenditure hypothesis and are, by and large, the same whether one considers short, medium or long horizons.*

**Keywords:** accounting for current account changes, intertemporal approach to the current account, variable-expenditure approach to the current account.

**JEL classification:** F32.

## **Resumen**

*El modelo intertemporal de la cuenta corriente supone que las variaciones de la balanza por cuenta corriente derivan de variaciones de la renta nacional y no de variaciones del consumo agregado, que se considera estable. Este artículo calcula de una manera exacta e intuitiva y para un total de 155 países en qué medida los movimientos de la cuenta corriente se pueden explicar por sus dos componentes, la renta nacional por un lado y el gasto nacional por otro. El artículo demuestra que, al contrario del modelo intertemporal, la balanza por cuenta corriente se ve más afectada por variaciones en el gasto que por variaciones en la renta. Lo que es más, deterioros de la cuenta corriente ocurren durante booms económicos cuando la renta nacional se expande rápidamente, y no viceversa como sugiere el modelo intertemporal. Los resultados empíricos respaldan por tanto la hipótesis de un gasto variable y son en general los mismos si uno considera horizontes cortos, medianos o largos.*

**Palabras clave:** determinantes empíricos de la cuenta corriente, modelo intertemporal de la cuenta corriente, hipótesis del gasto agregado variable.

**Clasificación JEL:** F32.

## **1. Introduction**

Nowadays that global imbalances have reached staggering heights, current account disequilibria are an important economic issue. Sustained current account deficits raise countries' external debt burdens and have the potential to trigger currency crises. Current account surpluses, on the other hand, can make countries vulnerable to changes in export demand and to debt defaults abroad.

With the current account balance being one of the most important variables of an open economy, one should expect that its economic determinants are well understood. Yet, as this paper seeks to demonstrate, this is not the case. This paper focuses on the most influential theory of the current account balance, the so-called intertemporal approach to the current account, and provides empirical evidence that undermines the theory's main idea.

The intertemporal approach is an old theory that was popularized in the 1980s and 1990s. The third volume of the *Handbook of International Economics* edited by Grossman and Rogoff (1995) dedicates a whole chapter to it (Obstfeld and Rogoff, 1995). And at least since the publication of the authoritative macroeconomics textbook by Obstfeld and Rogoff (1996), every graduate student attending international economics classes will have heard of it.

The main idea of the theory is easily conveyed. The permanent income hypothesis states that people should prefer stable over variable consumption, as this is the way to maximize utility over time (assuming, as is natural, that the utility function is concave). If countries do the same—that is, if they smooth consumption over time, too—they will save when income is high and dissave when income is low. Under the simplifying assumption that domestic agents hold only foreign assets, this implies that countries with temporarily high incomes will run current account surpluses and that countries with temporarily low incomes will run current account deficits.

To check the empirical validity of the intertemporal approach, this paper does something very simple. By the national income accounting identity, the current account is the difference between the national income and the national expenditure of a country. What this paper does is that it measures across countries to what extent the changes in the current account are accounted for by changes in national income and national expenditure, respectively. It then shows that current account changes do not primarily come about through changes in national income—as the intertemporal approach would predict—, but instead through changes in national expenditure.

The paper is structured as follows. Section 2 offers a brief review of the theory underlying the intertemporal approach to the current account as well as its empirical performance. Section 3 explains how changes in the current account can be attributed to different current account components and uses the proposed methodology to show that the intertemporal approach to the current account is at odds with the empirical data. Section 4 makes the case for a variable-expenditure approach to the current account, as an alternative to the stable-consumption-spending hypothesis implicit in the intertemporal approach. Finally, section 5 provides conclusions.

## **2. The intertemporal approach to the current account**

The simplest way to formalize the intertemporal approach to the current account is by means of an intertemporal model of consumption choice with two periods. However, for reasons that will become clear shortly, here a model with three periods

is presented. We may think of period 1 as the present, period 2 as the near future and period 3 as the distant future.

### 2.1. A model with stable consumption

Consider a representative agent maximizing utility from consumption over the periods 1, 2 and 3:

$$\max_{B_1, B_2} u(C_1) + \beta u(C_2) + \beta^2 u(C_3) \quad [1]$$

subject to the following three intertemporal budget constraints:

$$Y_1 + (1 + r)B_0 = C_1 + B_1 \quad [2]$$

$$Y_2 + (1 + r)B_1 = C_2 + B_2 \quad [3]$$

$$Y_3 + (1 + r)B_2 = C_3 + B_3 \quad [4]$$

where  $Y_t$  denotes the agent's income and  $B_t$  his or her net foreign assets at the end of period  $t$ .

The first-order conditions with respect to  $B_1$  and  $B_2$  yield the following two Euler equations:

$$u'(C_1) = \beta(1 + r)u'(C_2) \quad [5]$$

$$u'(C_2) = \beta(1 + r)u'(C_3) \quad [6]$$

Now let  $u(C) = \ln(C)$ . Then, since  $u'(C) = 1/C$ :

$$C_1 = \frac{1}{1 + \beta + \beta^2} W \quad [7]$$

$$C_2 = \frac{\beta(1 + r)}{1 + \beta + \beta^2} W \quad [8]$$

where

$$W = (1 + r)B_0 + Y_1 + \frac{Y_2}{1 + r} + \frac{Y_3}{(1 + r)^2} - \frac{B_3}{(1 - r)^2} \quad [9]$$

Note that the variable  $W$  captures the net foreign assets of the representative agent plus the present discounted value of his or her current and future incomes minus his or her final bequest.

The current account is the difference between the agent's net foreign asset holdings of two consecutive periods. Therefore,  $CA_1$  and  $CA_2$  are given by the following two equations:

$$CA_1 = B_1 - B_0 = Y_1 + rB_0 - C_1 = Y_1 + rB_0 - \frac{1}{1 + \beta + \beta^2} W \quad [10]$$

$$CA_2 = B_2 - B_1 = Y_2 + rB_1 - C_2 = Y_2 + rB_1 - \frac{\beta(1 + r)}{1 + \beta + \beta^2} W \quad [11]$$

Although the formulas in equations [10] and [11] look simple, they are not. In order to assess whether the intertemporal approach predicts the levels of  $CA_1$  and  $CA_2$  correctly, one needs to estimate the values of  $Y_3$  and  $B_3$  in the distant future, which is all but an easy task.

This paper considers assessing the validity of the intertemporal approach based on changes of the current account balance, rather than on its level. The change in the current account between period 1 and period 2,  $\Delta CA_2$ , is given by:

$$\Delta CA_2 = \Delta Y_2 + r\Delta B_1 - \Delta C_2 = \Delta Y_2 + rCA_1 - \frac{\beta(1 + r) - 1}{1 + \beta + \beta^2} W \approx \Delta Y_2 \quad [12]$$

Hence if  $\beta \approx 1/(1 + r)$ , the change in the current account balance between periods 1 and 2 is approximately equal to the change in income between those two periods. That is, there is no need to know the initial and final stocks of assets,  $B_0$  and  $B_3$ , or the income in the distant future,  $Y_3$ . Note that in the benchmark case where  $\beta = 1$  and  $r = 0$ , the approximation becomes a strict equality:

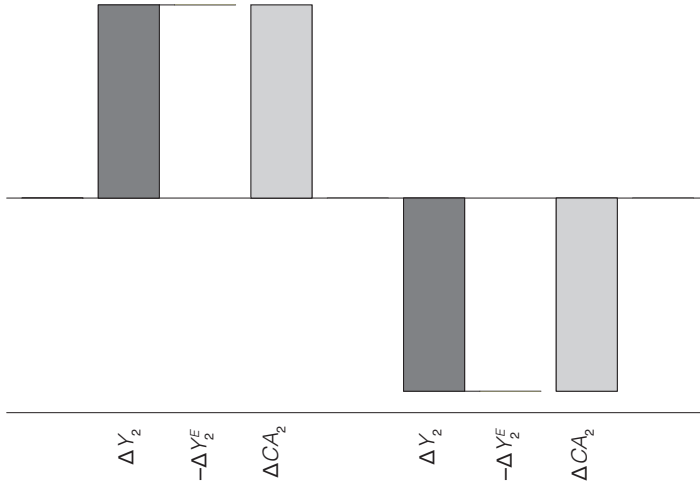
$$CA_1 = B_1 - B_0 = Y_1 - C_1 = Y_1 - \frac{1}{3} (B_0 + Y_1 + Y_2 + Y_3 - B_3) \quad [13]$$

$$CA_2 = B_2 - B_1 = Y_2 - C_2 = Y_2 - \frac{1}{3} (B_0 + Y_1 + Y_2 + Y_3 - B_3) \quad [14]$$

$$\Delta CA_2 = \Delta Y_2 \Leftrightarrow \frac{\Delta Y_2}{\Delta CA_2} = 1 \quad [15]$$

The result in equation [15] is illustrated in Figure 1. Note that  $Y_t^E$  denotes national expenditure, which in this model is equal to aggregate consumption,  $C_t$ , since investment and government spending are set to zero. As consumption is smooth, so is national expenditure, implying that  $\Delta Y_2^E = \Delta C_2 = 0$ . This is why any change in income,  $\Delta Y_2$ , must be matched by an equivalent change in the current account balance,  $\Delta CA_2$ .

**FIGURE 1**  
**CHANGES IN INCOME, EXPENDITURE AND THE CURRENT**  
**ACCOUNT THAT ARE CONSISTENT WITH THE INTERTEMPORAL**  
**APPROACH TO THE CURRENT ACCOUNT WITHOUT GROWTH**  
**IN EXPENDITURE**



NOTE: The left-hand side shows a rise in the current account and the right-hand side a fall in the current account.

SOURCE: Own elaboration.

## 2.2. Models with consumption growth

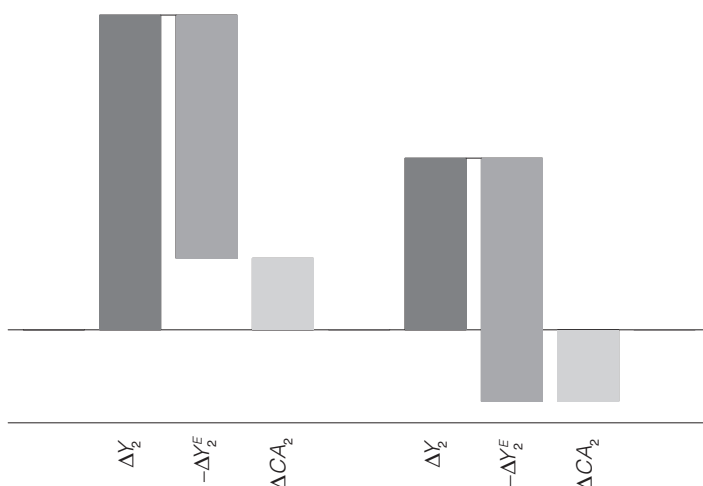
More advanced models of intertemporal consumption choice show that consumption may not be totally smooth, but that it should grow proportionally to wealth (see, for example, Merton, 1971; Müller-Plantenberg, 2017a,b). This means that changes in national expenditure,  $\Delta Y_t^E$ , are positive, yet approximately constant. However, even in this case equation [15] should hold approximately, provided sufficiently many observations are available.

To see this point more clearly, suppose, for example, that the current account of a country is as likely to rise by  $\overline{\Delta CA}$  as to fall by  $\overline{\Delta CA}$  between periods 1 and 2. Then if national expenditure grows over time by a constant amount  $\overline{\Delta Y^E}$ , the ratio between income and the current account should equal one in expectation:

$$E\left(\frac{\Delta Y_2}{\Delta CA_2}\right) = \frac{1}{2} \left( \frac{\overline{\Delta Y^E} + \overline{\Delta CA}}{\overline{\Delta CA}} + \frac{\overline{\Delta Y^E} - \overline{\Delta CA}}{-\overline{\Delta CA}} \right) = 1 \quad [16]$$

This result is illustrated in Figure 2. The figure is drawn in such a way that  $-\Delta Y_2^E$  has the same height on both sides of the figure. Now, if one divides the heights of the bars for  $\Delta Y_2$  on the left-hand side and the right-hand side, respectively, by the heights of the bars for  $\Delta CA_2$  on both sides, then one half times the sum of the resulting ratios equals one.<sup>1</sup>

**FIGURE 2**  
**CHANGES IN INCOME, EXPENDITURE AND THE CURRENT**  
**ACCOUNT THAT ARE CONSISTENT WITH THE INTERTEMPORAL**  
**APPROACH TO THE CURRENT ACCOUNT WHEN EXPENDITURE**  
**IS GROWING**



NOTE: The left-hand side shows a rise in the current account and the right-hand side a fall in the current account.

SOURCE: Own elaboration.

### 2.3. Empirical evidence on the intertemporal approach

Although the model presented here is simple, it conveys well the main intuition of the intertemporal approach to the current account. While the literature has come up with many theoretical extensions, it has proven much more difficult to ascertain whether the model, with or without extensions, fits the empirical facts. The main problem lies in the fact that in order to determine the optimal level of the current account, one needs to forecast national incomes and expenditures far into the future. Many of the empirical studies have tried to deal with this problem by adapting the present value methodology developed by Campbell (1987) and Campbell and Shiller (1987) to estimate the theoretically desired current account balance.

<sup>1</sup> Based on the numbers used to generate the Figure 2, it must hold that  $0.5 \times [4.4/1.0 + 2.4/(-1.0)] = 1.0$ , which is the case.

Present value models of the current account have been estimated for Australia, Austria, Belgium, Canada, Denmark, France, Germany, Japan, Sweden and the United States (for references, see Singh, 2007). Ca' Zorzi and Rubaszek (2012) provide a calibration of the intertemporal approach for the twelve countries that formed the eurozone in the period from 2001 to 2006. However, the evidence has been inconclusive on the whole, with many studies finding supportive evidence for some countries, but not for others. This is why in his comprehensive survey of the subject, Singh (2007) comes to the following disappointing conclusion:

“The intertemporal optimizing models of trade and current account balance and the new open-economy macroeconomics models provide a sound micro-theoretic framework; these models, however, lack a matching empirical validation of the theoretical propositions.”

### 3. Accounting for current account changes

The considerations of section 2 suggest that it may be useful to measure the degree to which changes in the current account are accounted for by changes in national income and its components, as this may help us to determine whether the intertemporal approach to the current account fits the facts.

#### 3.1. The unbounded contribution measure (UCM)

To decompose the movements of the current account, this paper relies on a simple measure proposed by Eleftheriou and Müller-Plantenberg (2018), which the authors call unbounded contribution measure, or UCM. Suppose there is a variable  $x_t$ , which is the sum of the variables  $x_{1,t}, x_{2,t}, \dots, x_{k,t}$ . Then the change of  $x_t$  over a given horizon of  $h$  periods can be exactly attributed to the changes of the  $k$  components of  $x_t$  over that horizon. For example, if  $x_t$  rises by 10 units and  $x_{i,t}$  by 7 units, we can say that  $x_{i,t}$  contributes 70 per cent to the movement of  $x_t$ . Note that no econometrics is needed here, all one has to do is simple accounting.

Formally, the unbounded contribution measure for the component  $x_{i,t}$  with respect to the composite series  $x_t$  is defined as follows:

$$\text{UCM}(x_{i,t}, x_t) = \sum_{t=h+1}^T \frac{|\Delta_h x_t|}{\sum_{t=h+1}^T |\Delta_h x_t|} \times \frac{\Delta_h x_{i,t}}{\Delta_h x_t} \quad [17]$$

where  $\Delta_h = 1 - L^h$  and  $L$  is the lag operator. What the unbounded contribution measure does is that it gives weights to the contribution of  $x_{i,t}$  to  $x_t$ ,  $\Delta_h x_{i,t} / \Delta_h x_t$ , that are proportional to the absolute value of the change in  $x_t$ ,  $|\Delta_h x_t|$ .

Note the following very useful properties of the unbounded contribution measure:

$$\text{UCM}(x_{i,t} + x_{j,t}, x_t) = \text{UCM}(x_{i,t}, x_t) + \text{UCM}(x_{j,t}, x_t) \quad [18]$$

$$\text{UCM}(ax_{i,t}, x_t) = \text{UCM}\left(x_{i,t}, \frac{1}{a}x_t\right) = a\text{UCM}(x_{i,t}, x_t) \quad [19]$$

$$\sum_{i=1}^k \text{UCM}(x_{i,t}, x_t) = 1 \quad [20]$$

Eleftheriou and Müller-Plantenberg (2018) also provide an alternative contribution measure, called the bounded contribution measure, or BCM. This contribution measure restricts the contribution of a component series to the changes of the composite measure to lie between 0 per cent and 100 per cent and is hence defined as:

$$\text{BCM}(x_{i,t}, x_t) = \sum_{t=h+1}^T \frac{|\Delta_h x_t|}{\sum_{t=h+1}^T |\Delta_h x_t|} \times \max \left[ \min \left( \frac{x_{i,t}}{x_t}, 1 \right), 0 \right] \quad [21]$$

However, since this paper is interested in the possibility of negative contributions of current account components to the movements of the current account, it uses the unbounded contribution measure. Another reason for adopting the unbounded contribution measure is that the properties in equations [18] to [20] do not in general carry over to the bounded contribution measure.

### 3.2. Current account decompositions

In this paper, different decompositions of the current account are considered, which are all based on the national income identity:

$$Y_t = Y_t^E + CA_t \quad [22]$$

where  $Y_t$  is gross national disposable income (GNDI) and  $Y_t^E$  gross national expenditure (GNE); for simplicity, in what follows  $Y_t$  may be referred to as national income and  $Y_t^E$  as national expenditure or national spending. Note that national expenditure is defined as  $Y_t^E = C_t + I_t + G_t$ .

In the following sections, three different decompositions of the current account will be distinguished, which are all based on equation [22]. The first decomposition of the current account is given by (decomposition 1):

$$CA_t = x_{1,t} + x_{2,t} \quad [23]$$



where

$$\begin{aligned}x_{1,t} &= Y_t \\x_{2,t} &= -Y_t^E\end{aligned}$$

The second decomposition of the current account is given by (decomposition 2):

$$CA_t = x_{1,t} + x_{2,t} + x_{3,t} + x_{4,t} \quad [24]$$

where

$$\begin{aligned}x_{1,t} &= Y_t \\x_{2,t} &= -C_t \\x_{3,t} &= -I_t \\x_{4,t} &= -G_t\end{aligned}$$

Finally, the third decomposition of the current account makes use of the definition of national saving, namely  $S_t = Y_t - C_t - G_t$ , and is given by (decomposition 3):

$$CA_t = x_{1,t} + x_{2,t} \quad [25]$$

where

$$\begin{aligned}x_{1,t} &= S_t \\x_{2,t} &= -I_t\end{aligned}$$

### 3.3. Testing the intertemporal approach to the current account

Equations [15] and [16] suggest that a simple way to find out whether the intertemporal approach to the current account is consistent with the data is to check whether:

$$UCM(Y_t, CA_t) \geq 1 \Leftrightarrow UCM(-Y_t^E, CA_t) \leq 0 \quad [26]$$

where the equivalence of both inequalities results from the fact that  $CA_t = Y_t - Y_t^E$  and therefore:

$$UCM(Y_t - Y_t^E, CA_t) = UCM(Y_t, CA_t) + UCM(-Y_t^E, CA_t) = 1 \quad [27]$$

As was mentioned in section 2, according to more realistic models of intertemporal consumption choice, consumption may not be totally flat, but grow proportionally to wealth. Note, however, that the test in equation [26] is valid even in the case that

changes in national expenditure are not equal to zero, but constant ( $\Delta Y_t^E = \text{const.} \neq 0$ ). For if there are sufficient observations, it should hold that:

$$\text{UCM}(Y_t, CA_t) \approx$$

$$\frac{1}{2} [\text{UCM}(Y_t^E + CA_t, CA_t | \Delta CA_t > 0) + \text{UCM}(Y_t^E + CA_t, CA_t | \Delta CA_t < 0)] \approx 1 \quad [28]$$

a result that follows from the following two equalities:

$$\text{UCM}(Y_t^E, CA_t | \Delta CA_t > 0) \approx -\text{UCM}(Y_t^E, CA_t | \Delta CA_t < 0) \quad [29]$$

$$\text{UCM}(CA_t, CA_t | \Delta CA_t > 0) = \text{UCM}(CA_t, CA_t | \Delta CA_t < 0) = 1 \quad [30]$$

### 3.4. Empirical results

#### 3.4.1. Box plots

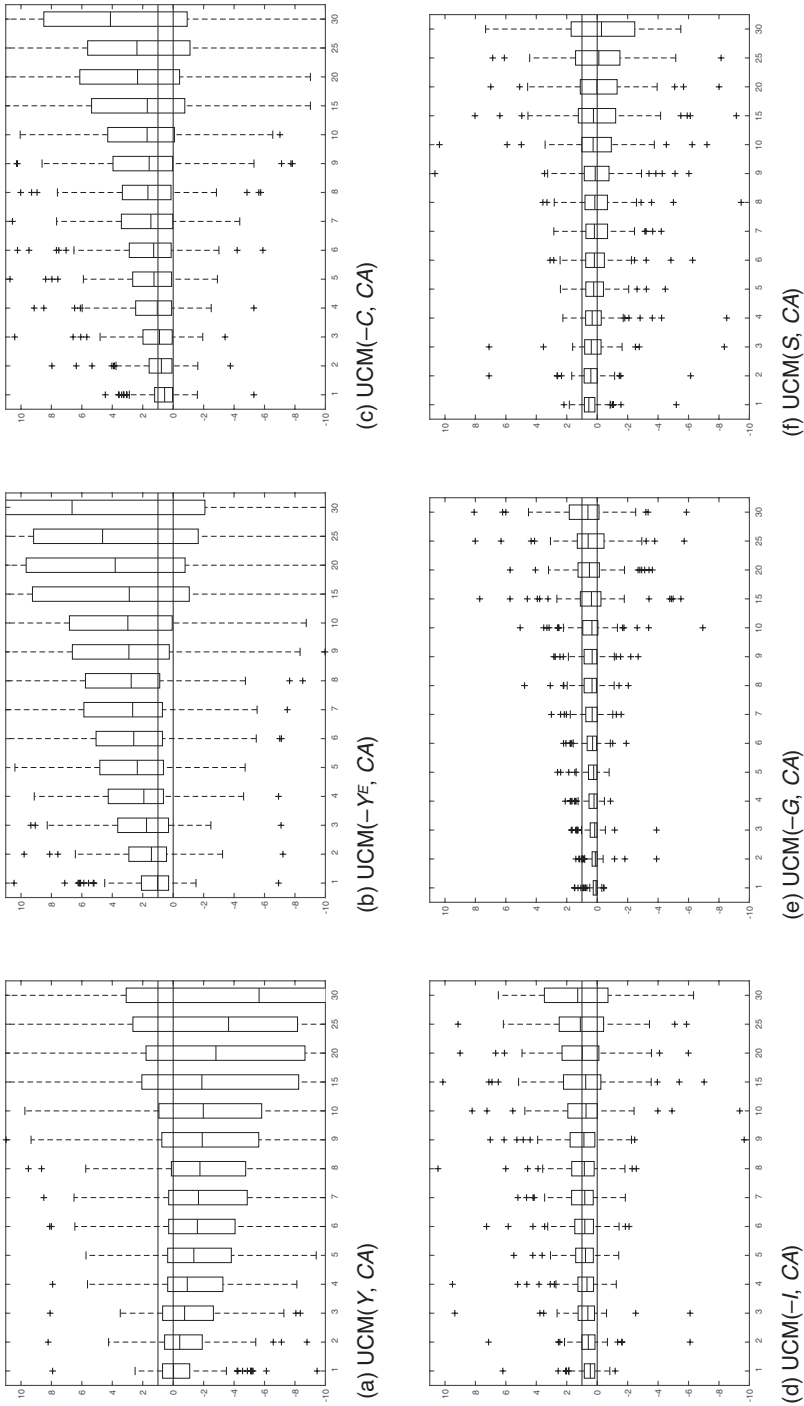
In this section, annual data series from the IMF's International Financial Statistics are used to compute the unbounded contribution measure, or UCM, for different components of the current account balance. In general, the contributions of a given current account component,  $x_{it}$ , to the overall current account balance,  $CA_t$ , differ across countries and horizons. This is why in this paper box plots are used to illustrate the distribution of  $\text{UCM}(x_{it}, CA_t)$  across countries and for different horizons,  $h$  (see Figures 3 to 5). The horizons considered range from 1 year to 30 years.

The box plots are generated as follows. On each box, the central mark is the median, the edges of the box are the 25th and 75th percentiles, the whiskers extend to the most extreme data points not considered outliers, and outliers are plotted individually. Points are drawn as outliers if they are larger than  $q_3 + w(q_3 - q_1)$  or smaller than  $q_1 - w(q_3 - q_1)$ , where  $q_1$  and  $q_3$  are the 25th and 75th percentiles, respectively, and  $w = 1.5$  (Matlab's default value corresponding to approximately  $\pm 2.7\sigma$  and 99.3 per cent coverage if the data are normally distributed).

#### 3.4.2. Data

The data set used in this paper spans the period from 1970 to 2016. The data are of an annual, rather than quarterly, frequency, so as to maximize the number of available observations for the box plots. Note, for example, that for an horizon of 1 year ( $h = 1$ ), data on all the relevant variables are available for 155 countries; that for an horizon of 4 years ( $h = 4$ ), data are available for 149 countries; that for an horizon of 10 years ( $h = 10$ ), data are available for 138 countries; and that for an horizon of 20 years ( $h = 20$ ), data are available for 104 countries. More information on the country coverage and the length of the time series is provided in appendix A.

**FIGURE 3**  
**ACCOUNTING FOR CURRENT ACCOUNT CHANGES**



SOURCE: *International Financial Statistics (IMF)*, author's calculations.

### 3.4.3. Accounting for current account changes

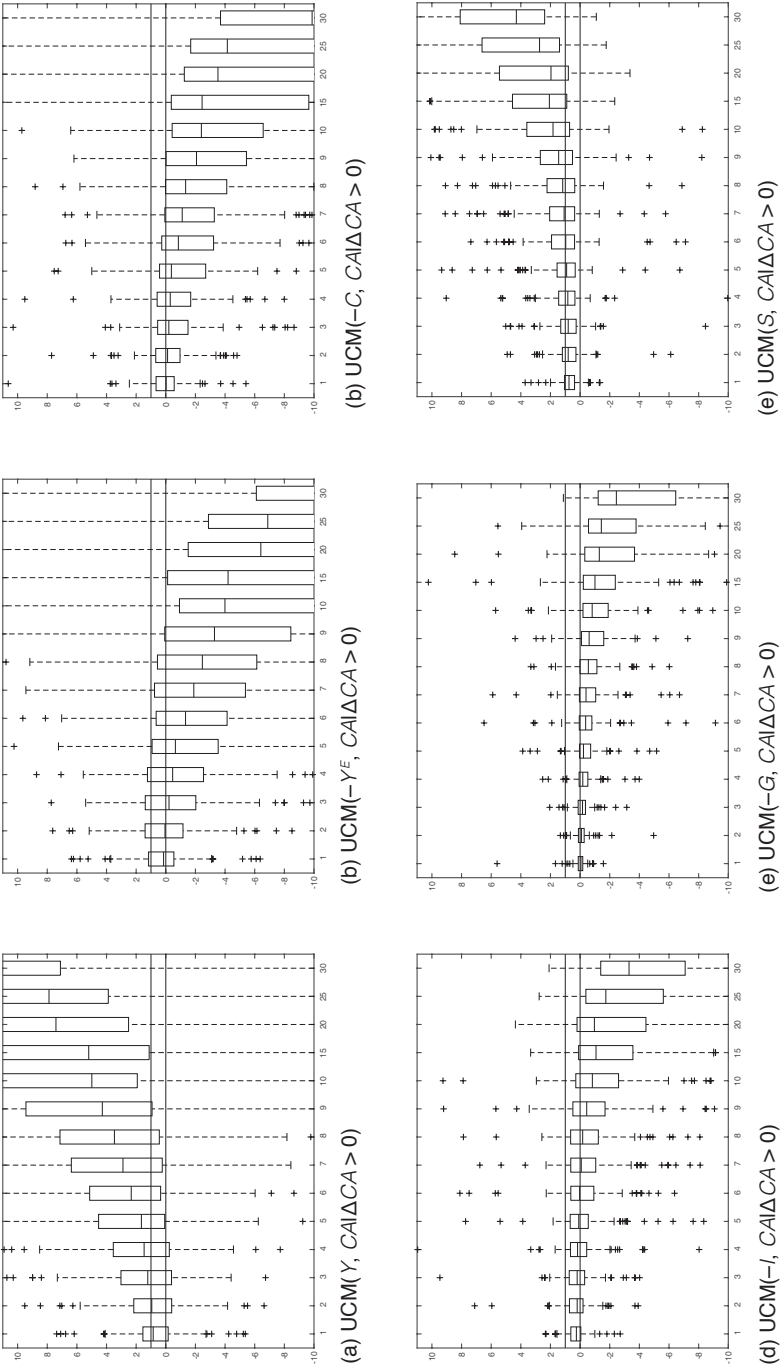
Now consider Figure 3, which contains the results of the accounting exercise for six different current account components. Panel a of Figure 3 is of special interest here as it contains the box plots for  $UCM(Y_t, CA_t)$  for horizons ranging from 1 year to 30 years. Strikingly, the centre of the distribution—understood here as the range from the 25th to the 75th percentile—is mostly negative and does not reach the value of one except at long horizons. Indeed, the median of the distribution is always negative, implying that national income does not contribute at all to current account movements in the way the intertemporal approach predicts. For example, the median values of  $UCM(Y_t, CA_t)$  for  $h = 1, h = 4, h = 10$  and  $h = 20$  are  $-0.02, -0.93, -1.98$  and  $-2.81$ , respectively.

From equation [27], we know that  $UCM(-Y_t^E, CA_t) = 1 - UCM(Y_t, CA_t)$ . Hence, the negative values of  $UCM(Y_t, CA_t)$  are mirrored by values above one for  $UCM(-Y_t^E, CA_t)$ . And indeed, panel b of Figure 3 shows that for the majority of countries,  $UCM(-Y_t^E, CA_t)$  is larger than one. This means that national expenditure tends to move in excess of what would be needed to produce a given change in the current account.

Panels c to e of Figure 3 display the unbounded contribution measures for the three components of national expenditure, namely consumption, investment and government spending. What is evident from the box plots is that the movements of consumption alone are on average sufficient to produce the current account fluctuations observed across countries. For example, the median values of  $UCM(-C_t, CA_t)$  for  $h = 1, h = 4, h = 10$  and  $h = 20$  are  $0.56, 1.04, 1.71$  and  $2.34$ , respectively. Investment also contributes heavily to current account changes, the median values of  $UCM(-I_t, CA_t)$  being  $0.45$  for  $h = 1$ ,  $0.67$  for  $h = 4$ ,  $0.73$  for  $h = 10$  and  $0.98$  for  $h = 20$ . The values for  $UCM(-G, CA)$  are positive in general, too, yet not as large as those for  $UCM(-C_t, CA_t)$  and  $UCM(-I_t, CA_t)$ .

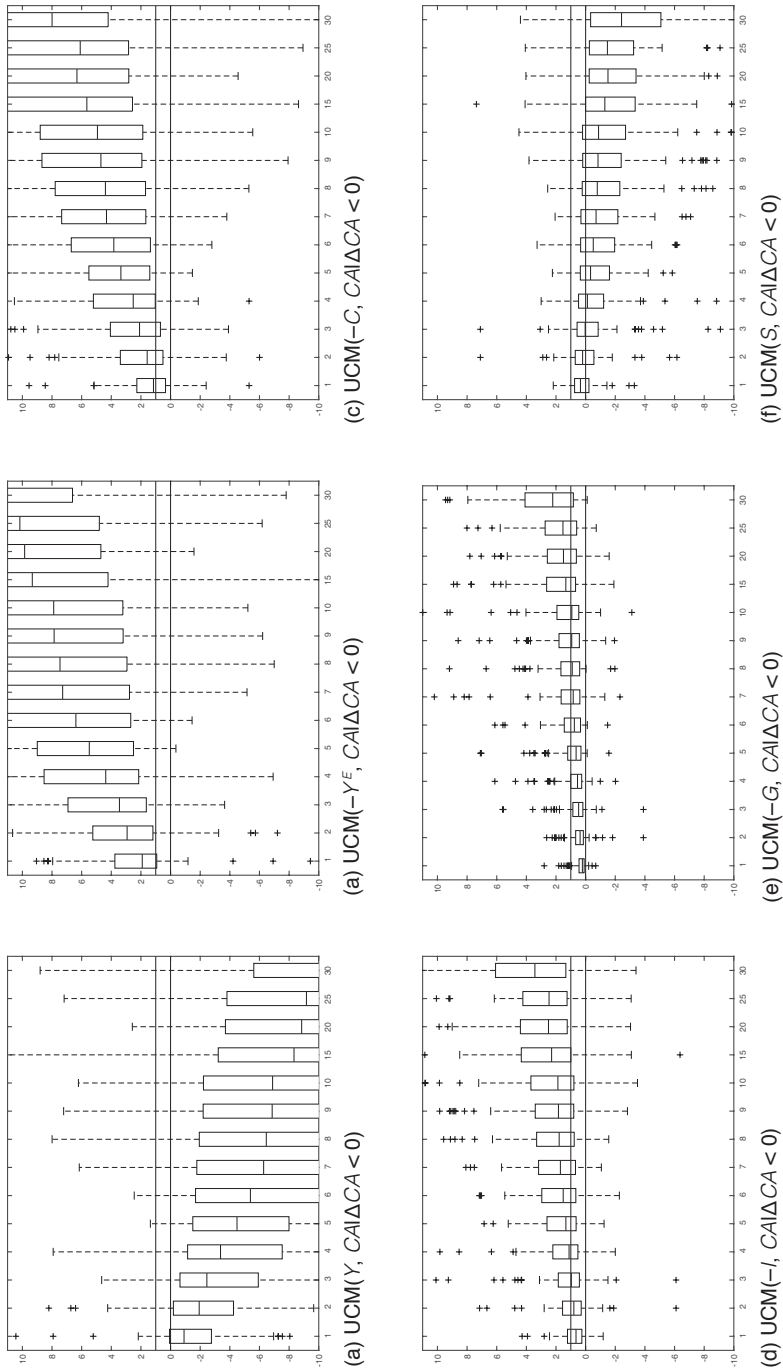
Finally, consider aggregate savings, which are plotted in panel f of Figure 3. Since  $CA_t = S_t - I_t$ , it must hold that  $UCM(S_t, CA_t) = 1 - UCM(-I_t, CA_t)$ . Therefore, the medians of  $UCM(S_t, CA_t)$  lie between zero and one, yet decline as the horizon increases.

FIGURE 4  
ACCOUNTING FOR POSITIVE CURRENT ACCOUNT CHANGES



SOURCE: *International Financial Statistics (IMF)*, author's calculations.

FIGURE 5  
ACCOUNTING FOR NEGATIVE CURRENT ACCOUNT CHANGES



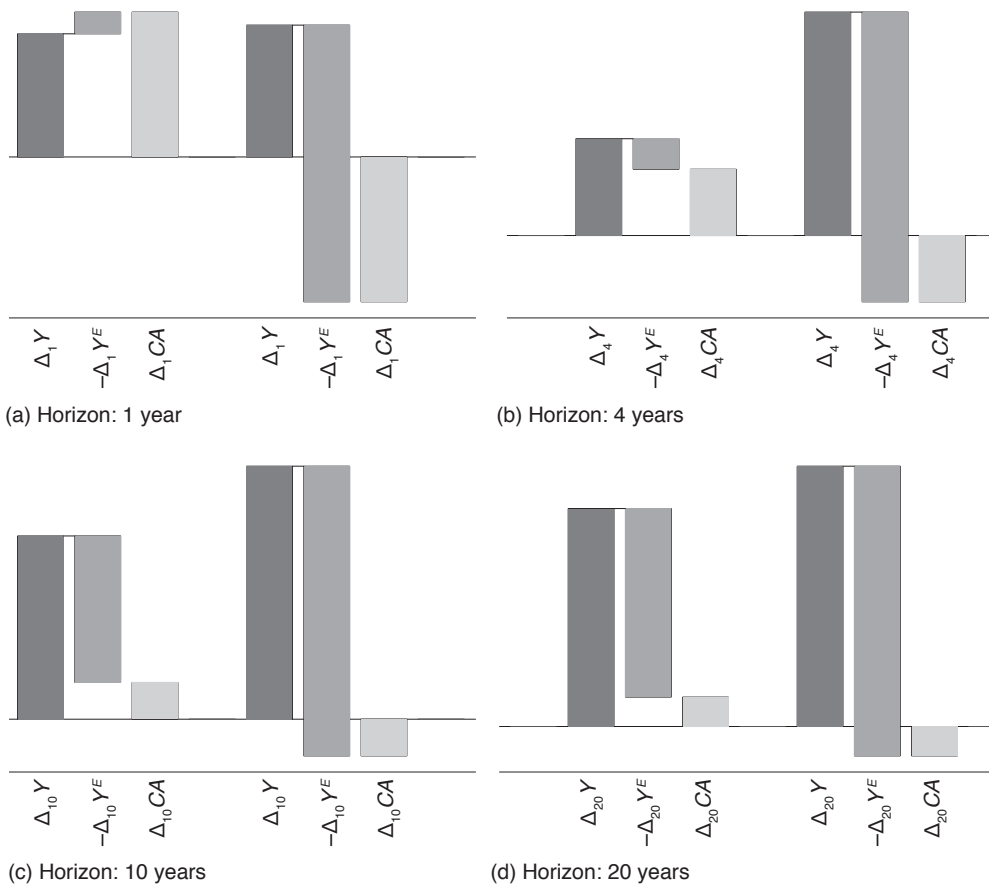
SOURCE: *International Financial Statistics (IMF)*, author's calculations.

### 3.4.4. Current account improvements versus current account deteriorations

Since  $Y_t$  and  $Y_t^E$  are generally increasing, one can expect the conditional contribution measures  $UCM(Y_t, CA_t | \Delta CA_t > 0)$  and  $UCM(Y_t^E, CA_t | \Delta CA_t > 0)$  on the one hand and  $UCM(Y_t, CA_t | \Delta CA_t < 0)$  and  $UCM(Y_t^E, CA_t | \Delta CA_t < 0)$  on the other to be of opposite sign. That this is indeed the case can be seen from Figures 4 and 5.

However, splitting up the current account changes into positive and negative ones provides even more interesting information. First, Figure 4 shows that  $UCM(Y_t, CA_t | \Delta CA_t > 0)$  is larger than one in general, implying that current account improvements are fully accounted for by increases in national income. Or, put differently,  $UCM(Y_t^E, CA_t | \Delta CA_t > 0)$  is negative, so that current account booms tend to occur despite rising consumption, investment and government expenditures. If,

**FIGURE 6**  
**EMPIRICAL CURRENT ACCOUNT CHANGES**



**SOURCE:** *International Financial Statistics (IMF)*, author's calculations.

on the other hand, one looks at negative current account changes, a very different picture emerges. In Figure 5, one can observe that current account deteriorations normally occur in the presence of strong growth in income, yet even larger increases in expenditure.

To see the differences between positive and negative current account changes even more clearly, consider Figure 6. There are four plots, for the horizons  $h = 1$ ,  $h = 4$ ,  $h = 10$  and  $h = 20$ , respectively. Each of the plots considers two current account changes, a positive one on the left-hand side and a negative one of the same size on the right-hand side. Based on the median values of  $UCM(Y_t, CA_t | \Delta CA_t)$  and  $UCM(Y_t^E, CA_t | \Delta CA_t)$ , to the left of the bars representing the change in the current account, there are two bars representing the changes in income and expenditure, respectively.

Now consider positive current account changes. At a horizon of 1 year, an improvement of the current account comes about through a rise in income and also a small fall in expenditure. At horizons of 4, 10 and 20 years, however, the current account increases come about through heavy increases in income and despite rising national expenditure.

Turning to negative current account changes, we make the striking observation that income tends to rise more when the current account is falling than when it is rising—a clear contradiction of the intertemporal approach. The reason why the current account falls has nothing to do with falling income, yet lies in the fact that current account deteriorations are associated with massive increases in aggregate spending.

#### 4. The variable-expenditure approach to the current account

Section 3 has come up with strong cross-country evidence suggesting that worsening current account balances have more to do with high aggregate spending than with low national income. It thus confirms an hypothesis made in Müller-Plantenberg (2017a,b). The purpose of this section is to illustrate the empirical results obtained so far with a brief case study (section 4.1) and to ask whether it is true in general that expenditure is more volatile than income (section 4.2).

##### 4.1. *The Asian crisis*

An economic episode that illustrates the point made in this paper extremely well is the Asian crisis of 1997-1998. In the years prior to the crisis, all of the afflicted economies experienced burgeoning current account deficits. In 1996, Indonesia's current account deficit reached 3.2 per cent of GDP, Korea's deficit 4.0 per cent, Malaysia's deficit 4.4 per cent and Thailand's deficit 8.0 per cent. However, two years later, the mentioned countries run current account surpluses of 4.0 per cent, 10.7 per cent, 13.2 per cent and 12.5 per cent of GDP, respectively. In fact, Korea, the largest of the four economies, recorded the third-largest current account deficit in the world in 1996 (of 160 countries), yet came up only two years later with the world's second-largest surplus (of 162 countries)!

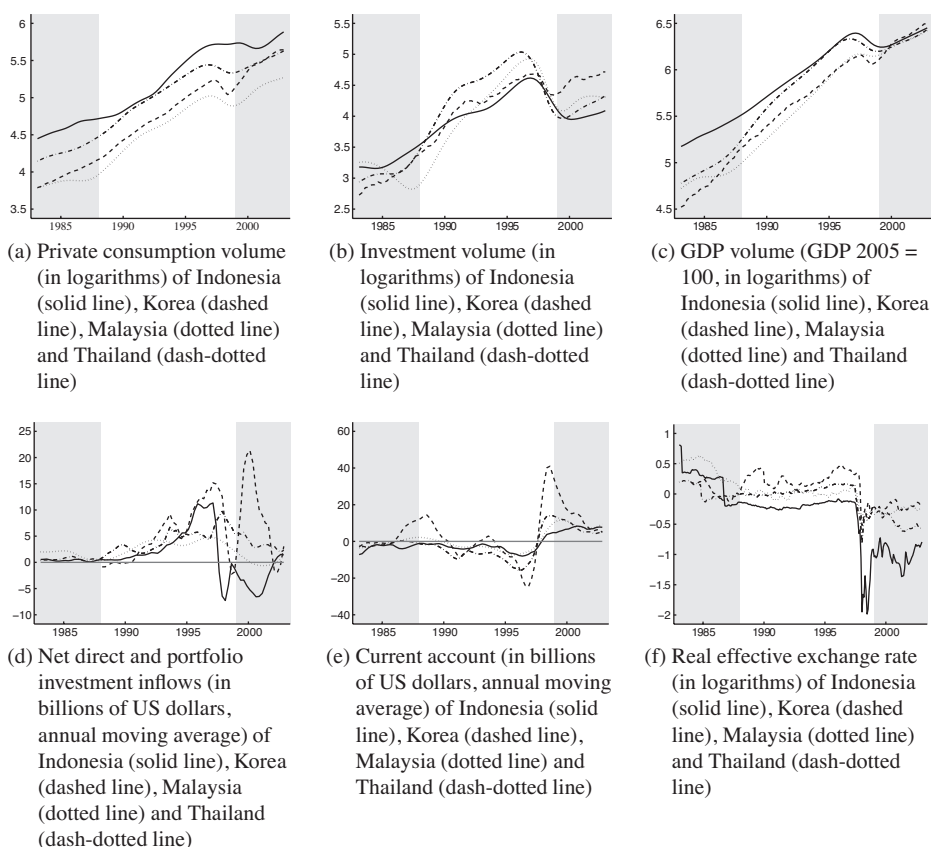


**TABLE 1**  
**NATIONAL EXPENDITURE AND GDP GROWTH DURING THE ASIAN CRISIS**  
 (%)

	Indonesia	Korea	Malaysia	Thailand
<b>Boom: 1988-1996</b>				
Real consumption (per year)	8.4	8.5	8.5	8.3
Real investment (per year)	9.0	10.9	17.2	13.1
Real GDP (per year)	7.3	7.8	9.4	9.0
<b>Bust: 1997-1998</b>				
Real consumption (per year)	-4.5	-11.0	-15.0	-11.3
Real investment (per year)	-21.9	-23.3	-42.3	-40.7
Real GDP (per year)	-13.1	-6.9	-7.3	-10.5

**SOURCE:** *International Financial Statistics (IMF)*, author's calculations.

**FIGURE 7**  
**CASE STUDY: ASIAN CRISIS 1997-1998.**



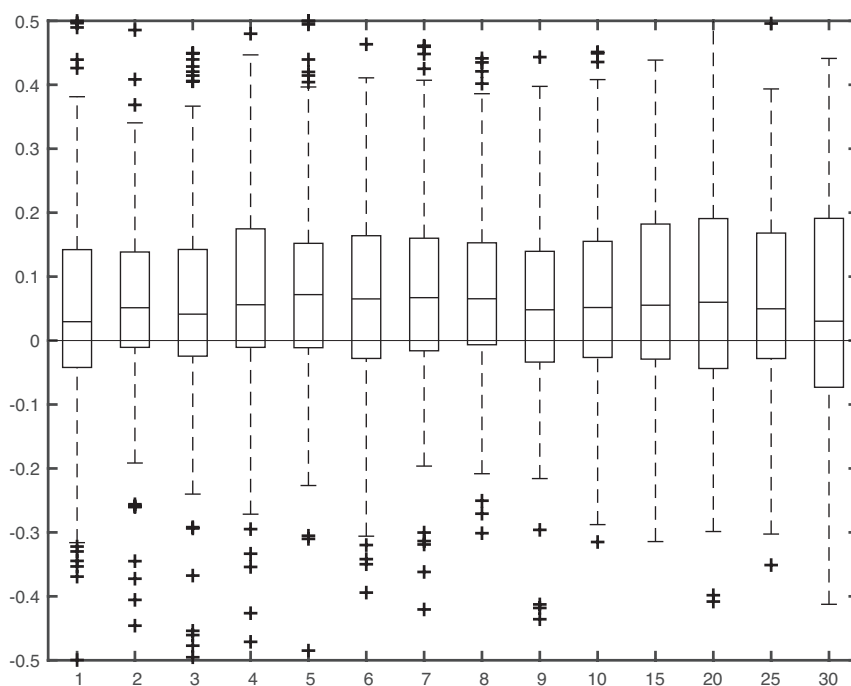
**SOURCE:** *International Financial Statistics (IMF)*, author's calculations.

So were the massive current account deficits and subsequent turnarounds of the external balance in the cited countries due to changes in income or changes in expenditure? It only needs a glimpse at Table 1 and Figure 7 and the answer is clear. Evidently, the large current account deficits the countries in question were running prior to the crisis were not the result of low output or income growth—GDP was rising fast—, but to exceptionally high and very persistent growth in consumption and investment expenditure. Similarly, the reason why the current account balances improved so dramatically did not have to do with rising incomes—in 1997-1998, all countries considered experienced severe recessions—, but with heavy contractions of consumption demand and, in particular, investment spending.

#### 4.2. *Spending volatility versus income volatility*

An important message that we took away from Figure 6 was that when a country turns from an external surplus to an external deficit, this is mainly due to a large increase in national expenditure. National income, for its part, does not only move in the wrong direction, it is also much more stable than national spending. A natural

**FIGURE 8**  
**RATIOS OF STANDARD DEVIATIONS OF LOG CHANGES IN GNE AND GNDI**



SOURCE: *International Financial Statistics (IMF)*, author's calculations.

question that arises in this context is whether it is generally true that aggregate spending fluctuates more than aggregate income.

To answer this question, Figure 8 plots the distributions of the following statistic across countries for horizons ranging from 1 year to 30 years (using the dataset described in appendix A):

$$\frac{\text{Std}(\Delta_h \ln(Y_t^E))}{\text{Std}(\Delta_h \ln(Y_t))} \quad [31]$$

The message of Figure 8 is clear. No matter which horizon one considers, the changes in national expenditure are always significantly more variable than those in national income.

## 5. Conclusions

The idea to the present study arose during the preparation of Müller-Plantenberg (2017a,b). These two papers present a whole series of historical episodes of economic booms and crashes and establish a general empirical pattern whereby burgeoning current account deficits are by and large the result of investment-driven economic booms. Investment booms, for their part, may have different causes, such as, for example, investor-friendly economic policies—including tax cuts, market-oriented economic reforms, exchange-rate-based stabilization plans and financial account liberalizations—as well as stock-market booms and natural resource discoveries.

Consumption booms seem to contribute to current account deficits, too. Even though the permanent income hypothesis suggests that consumption should be stable, it is evident that changes in economic mood do lead to significant fluctuations in aggregate consumption. Montiel (2000) identifies economy-wide wealth effects—associated, for instance, with favourable movements in the terms of trade or euphoric expectations triggered by macroeconomic reforms—as well as lending booms following financial liberalization as the most important driving forces behind consumption booms.

This paper shows that what matters most for the current account balance are not changes in national income, but changes in national expenditure. It does so by applying simple accounting methods to the current accounts of a large cross-section of countries. The message is clear: If we want to understand the emergence of balance of payments imbalances, what we need to do is to understand better what drives changes in consumption and investment demands. Income changes may contribute to current account improvements, yet they are irrelevant for current account deteriorations.

## APPENDIX A

### DATA

As mentioned in section 3.4, the data of the empirical part of this paper were taken from the IMF's International Financial Statistics. The sample period of runs from 1970 to 2016. The total number of countries is 155. However, for many countries data is only available for a part of the sample period (to be precise, the minimum and maximum numbers of observations available for an individual country are 2 and 47, respectively, the mean number is 27.3 and the median number is 27.0).

The dataset covers the following countries:

Afghanistan, Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Azerbaijan, The Bahamas, Bahrain, Barbados, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Democratic Republic of the Congo, Republic of the Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Ecuador, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Euro Area, Fiji, Finland, France, Gabon, The Gambia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kosovo, Kuwait, Kyrgyzstan, Latvia, Lesotho, Lithuania, Macau, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Paraguay, Philippines, Poland, Portugal, Romania, Russia, Rwanda, Saint Lucia, Saint Vincent and the Grenadines, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Slovakia, Slovenia, Solomon Islands, South Africa, South Korea, South Sudan, Spain, Sri Lanka, Sudan, Suriname, Swaziland, Switzerland, Syria, São Tomé and Príncipe, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tunisia, Turkey, Uganda, Ukraine, United States, Uruguay, Vanuatu, Yemen, Zambia.

## Bibliography

- [1] CA' ZORZI, M. and RUBASZEK, M. (2012). «On the empirical evidence of the intertemporal current account model for the euro area countries». *Review of Development Economics*, 16 (1), 95-106.
- [2] CAMPBELL, J. Y. (1987). «Does saving anticipate declining labor income? An alternative test of the permanent income hypothesis». *Econometrica*, 55 (6), 1249-1273.
- [3] CAMPBELL, J. Y. and SHILLER, R. J. (1987). «Cointegration and tests of present value models». *Journal of Political Economy*, 95 (5), 1062-1088.
- [4] ELEFThERIOU, M. and MÜLLER-PLANTENBERG, N. A. (2018). «The purchasing power parity fallacy: Time to reconsider the PPP hypothesis». *Open Economies Review*, 29 (3), 481-515.
- [5] GROSSMAN, G. M. and ROGOFF, K. S. (eds.) (1995). *Handbook of International Economics*, 3. North Holland Elsevier Science, Amsterdam.
- [6] MERTON, R. C. (1971). «Optimum consumption and portfolio rules in a continuous-time model». *Journal of Economic Theory*, 3 (4), 373-413.
- [7] MONTIEL, P. J. (2000). «What drives consumption booms?» *World Bank Economic Review*, 14 (3), 457-480.
- [8] MÜLLER-PLANTENBERG, N. A. (2017a). «Boom-and-bust cycles, external imbalances and the real exchange rate». *The World Economy*, 40 (1), 56-87.
- [9] MÜLLER-PLANTENBERG, N. A. (2017b). «Currency flows and currency crises». *CESifo Economic Studies*, 63 (2), 182-209.
- [10] OBSTFELD, M. and ROGOFF, K. S. (1995). The intertemporal approach to the current account. In Gene M. Grossman and Kenneth S. Rogoff (eds.), *Handbook of International Economics*. North Holland Elsevier Science, Amsterdam, 1731-1799.
- [11] OBSTFELD, M. and ROGOFF, K. S. (1996). *Foundations of International Macroeconomics*. MIT Press, Cambridge, Massachusetts.
- [12] SINGH, T. (2007). «Intertemporal optimizing models of trade and current account balance: A survey». *Journal of Economic Surveys*, 21 (1), 25-64.