The size of the net foreign asset position, and the dynamics of current accounts

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Abstract

In this paper, we show that the impact of a transitory income shock on the current account should be equal to a combination of the traditional rule (i.e., the amount of savings) and the new view (i.e., the marginal unit of capital is equal to the average unit of capital). The empirical evidence suggests that the support for the traditional rule or the new view depends crucially on the size of the net foreign asset position of the country.

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1 Introduction

Current account imbalances have preceded and accompanied recent adverse economic and financial events. For instance, while the current account balance for OECD countries was around 0% as a share of GDP by mid-90s, it reached around -1.4% during 2005-2008. In some cases, such as Estonia, Iceland, Ireland, Portugal, and Spain, deficits surpassed 10% as a share of GDP in some years. This of course has implied huge variations in gross and net international investment positions. The consequences for the dynamics of current accounts are straightforward.

The standard view of the intertemporal approach for the current account[1], i.e., the traditional rule, is the benchmark model to analyze the impact of transitory income shocks (such as transitory fluctuations in production, transitory changes in the terms of trade, etc.). According to the traditional rule, when a transitory income shock occurs, the current account response is equal to the amount of savings generated by the shock, because it is invested completely in foreign bonds. This occurs when risk associated to investment is low compared to the effect of diminishing returns to capital. Figure 1 plots the current account balance against savings, both expressed as a share of GDP, employing a sample of 50 countries, with both industrial (22 countries) and developing countries (28) for the period 1970-2009[2]. The traditional rule suggests that the slope of the coefficient of the regression of the current account balance on savings should be equal to 1. Not surprisingly, the empirical evidence for the pooled data is clearly at odds with the traditional rule[3]. However, savings is a key variable to explain some of the behavior of current accounts.

Recent developments have provided another approach to analyze the dynamics of current accounts when transitory income shocks occur. According to the new rule (Kraay and Ventura, 2000; KV henceforth[4]), the impact of

[1] See Obstfeld and Rogoff (1995, 1996), Razin (1995), and Frenkel, Razin and Yuen (1996), for instance.

[2] More on this will be detailed below in Section 4.

[3] Including typical control variables, such as, the level and growth rate of population size, the level and growth rate of income per capita, and a time trend does not alter the results obtained, as we see below.

[4] See also Kraay and Ventura (2003), and Ventura (2003). Recent research by Guo and Jin (2009) and Tille and van Wincoop (2010) has cast doubts on the validity of the new rule to analyze the behavior of current accounts. However, Erauskin (2013) demonstrates that this criticism is flawed. First, the new rule is adapted to distinguish between gross

a transitory income shock on the current account balance in a small open economy is equal to the amount of savings multiplied by the net foreign asset position over domestic wealth in a small open economy. This occurs when risk associated to investment is high compared to the effect of diminishing returns of capital: transitory income shocks are invested on the margin as the average portfolio shares. Figure 2 plots the current account balance against savings multiplied by the ratio of the net foreign asset position to domestic wealth, both expressed as a share of GDP. The new rule states that the slope of the coefficient of the regression of the current account balance on savings multiplied by the ratio of the net foreign asset position to domestic wealth should be equal to 1. The new rule is rejected. However, we also observe that when the term associated to the new rule (x-axis) is "moderate", i.e., between -10% and $+5\%$ approximately (indicated as vertical lines for reference)[5], then the new rule seems to work much better to explain current account dynamics.

How can both evidences for the traditional rule and the new rule be reconciled? We propose combining both rules to explain current account dynamics more comprehensively, because neither the traditional rule nor the new rule can independently explain completely the dynamics of current accounts. The size of the net foreign asset position, either as a share of domestic wealth or as a share of GDP, is a key variable reconciling both rules. However, not only net magnitudes are important. As recent research has widely shown, gross foreign assets and liabilities also matter a lot,[6] but neither the traditional rule nor the new rule deal explicitly with gross magnitudes[7].

In this paper, we offer three main contributions. First, we adapt the new rule to distinguish between gross and net foreign asset positions, because gross and net financial positions matter. Then we adopt the new view, i.e., the marginal unit of capital is invested as the average unit of capital, and we combine it with the traditional rule. Thus, we find that the impact of

and net foreign asset positions. Second, the results for the between regression are not driven by an accounting-based "approximate" regression. Third, the results for the new rule are not driven by a steady state. See also the response by KV (2009).

[5]This corresponds to net foreign asset positions as a share of domestic wealth between -15% and 15%, as we see below.

[6]See Obstfeld (2012), for instance, which has argued that "the same factors that dictate careful attention to global imbalances also imply that data on gross international financial flows and positions are central to any assessment of financial stability risks".

[7]This issue was criticized by Tille and van Wincoop (2010), and it was addressed in a simpler model by Erauskin (2013).

a transitory income shock on the current account is equal to a combination of the traditional rule and the new view. Only when the growth rates in both countries are equal then the impact of a transitory income shock on the current account will be equal to a combination of the traditional rule and the new rule[8]. Second, we find that the traditional rule, the new view and the new rule altogether provide a satisfactory framework for the analysis of the impact of transitory shocks on current accounts. The size of the net foreign asset position as a share of wealth or as a share of GDP is a key explanatory variable. Thus, when the net foreign asset position as a share of wealth is "moderate", i.e., between -15% and $+15\%$, or as a share of GDP, i.e., between -30% and $+30\%$, the new view is strongly supported by the empirical evidence and the traditional rule plays a minor rule. However, for "big" creditor countries, the traditional rule plays a dominant role explaining adequately the dynamics of current accounts, whereas the new view provides a poor support. Finally, for "big" debtor countries, the empirical evidence provides a stronger support for the traditional rule than for the new view. However, the reaction of the current account is weaker than for creditor countries, reflecting probably financing constraints.[9]

The outline of the paper is as follows. Some initial evidence is sketched in Section 2. Section 3 describes a stylized model for a two-country world. Section 4 reviews the data sources employed. In Section 5 the main results are provided. Finally, we conclude.

2 Some initial evidence

The traditional rule states that the current account balance is equal to the amount of savings generated by a transitory income shock, which corresponds to equation (20):

[8]Please note that this result differs from the extended version of the new rule for a two-country world economy (Erauskin, 2009) in that it deals more explicitly with two-way capital flows and/or gross and net foreign asset positions, thus providing additional insights.

[9]Recent research has shown that current account statistics that are used to measure capital flows may not offer an adequate image in developing countries especially, because official flows (aid) matter a lot (Gourinchas and Jeanne, 2012; Alfaro et al., 2011). The implications of this strand of literature for the dynamics of current accounts are left for future research. However, we should note that the results of this paper remain robust for developing countries.

$$CA_{ct} = a_0 + a_1 S_{ct} + u_{ct}, \tag{1}$$

where CA_{ct} and S_{ct} denote current account balance and the amount of savings, respectively, both expressed as a share of GDP, for country c in period t, and u_{ct} is the error term for country c in period t. Under the null hypothesis that the traditional rule is true then the parameter a_1 in regression (1) should be equal to 1: an increase in savings leads to a one-to-one increase in the current account. Table 1 shows the results for the pooled data by ordinary least squares (OLS) and they confirm the "Feldstein-Horioka puzzle" once again (Feldstein and Horioka, 1980)[10]. Figure 1 captures the pooled regression, as mentioned above. However, it is straightforward to see that the traditional rule is able to explain some of the dynamics concerning current account behavior, looking at Figure 1. Furthermore, while the pooled estimation uses all the available variation between variables by OLS, the between-group estimates (i.e., based on the mean values of the variables of the group) and the within-group estimates (also called fixed-effects estimators, i.e., in terms of deviations from the mean values of the variables of the group) offer more information about whether the pooling estimate is driven by persistent (the former case) or transitory (the latter case) differences. We also include the usual control variables in the regression. Population and output per capita (both in levels and growth rates) are included, so that the size and performance of the economy is considered. A time trend is also added to the regression. Now the period analyzed is restricted to 1975-2009 for the same set of countries due to data availability[11]. Results are robust across different specifications.

The new rule predicts that the impact a transitory income shock on the current account is equal to the ratio of the net foreign asset position times savings. The new rule can be tested with equation (23):

[10]The "Feldstein-Horioka puzzle" refers to the paradox of having perfect capital mobility going along with a strong association between savings and investment. See Apergis and Tsoumas (2009) for a recent survey on the Feldstein-Horioka puzzle. See also Obstfeld (1995), Obstfeld and Rogoff (1996), and Coakley, Fulasi, and Smith (1998) for older surveys. Blanchard and Giavazzi (2002) suggest that the Feldstein-Horioka result is losing some support in the euro area. Recent developments have "solved" the puzzle either introducing heterogeneity in the transmission of global shocks (Giannone and Lenza, 2008), or introducing financial frictions (Bai and Zhang, 2010), for instance.

[11]See Section 4 for more details on the data sources.

$$CA_{ct} = a_0 + a_1 \left(\frac{P_{ct}}{W_{ct}} \right) S_{ct} + u_{ct}, \tag{2}$$

where P_{ct} refers to the net foreign asset position, and W_{ct} is domestic wealth for country c in period t. Under the null hypothesis that the new rule is true then the parameter a_1 should be equal to 1: increases in savings lead to variations in the current account that are equal to the fraction of the net foreign asset position with respect to the level of domestic wealth for country c in period t times savings. Current account balance and the amount of savings are expressed as a share of GDP again. Table 2 shows the results for regression (2): the new rule is clearly rejected by the data, as we saw before.

However, Figure 2 also suggests that the new rule seems to work fairly well in the neighborhood of 0, for "moderate" net foreign asset positions. We can be more precise about the size of the net foreign asset position. Figure 2 also plots two vertical lines for the range where a linear relationship seems to hold for regression (2), that is, for values of the ratio of the net foreign asset position to domestic wealth times savings, $\left(\frac{P}{W}\right) S$, between -0.1 and $+.05$, approximately. Next, we plot the net foreign asset position over domestic wealth against the ratio of the net foreign asset position to domestic wealth times savings in Figure 3. Three vertical lines and two horizontal lines are also depicted for reference. Figure 3 shows that for values of the ratio of the net foreign asset position to domestic wealth times savings between -0.1 and $+.05$, different values of the net foreign asset position are assigned, thus blurring a linear relationship between both variables. However, if we restrict to values of the size of the net foreign asset position as a share of domestic wealth between -15% and $+15\%$, using horizontal lines for reference, then a clear linear relationship emerges. Therefore, the size of the net foreign asset position seems a key variable to explain current account dynamics: for "moderate" values of the net foreign asset position, i.e., when the size of the net foreign asset position as a share of domestic wealth is between -15% and $+15\%$, we suggest that the new rule is a satisfactory framework to account for the dynamics of current accounts[12]. Figure 4 captures this finding. Table 3 confirms this result for the pooled data by OLS. These estimates provide a strong support for the new rule, even for the within estimate. This lies

[12] An additional issue is raised here. Some countries exhibit "big" positions in foreign assets, combined with moderate net positions and flows. These observations are not included in this group, but on the "big" creditors' group, because they are similar.

in stark contrast to previous research, where the new rule explained almost nothing in the short run, even though it provided a satisfactory account for the long run (Kraay and Ventura, 2002). A strong support for the new rule is found across different specifications as well in Table 3, when control variables are included.

The new rule refers crucially to the size of the net foreign asset position as a share of domestic wealth. However, the size of the net foreign asset position is usually expressed as a share of GDP, instead of as a share of domestic wealth, in many strands of the literature. To see the relationship between both magnitudes, we plot the size of the net foreign asset position as a share of GDP against the size of the net foreign asset position as a share of domestic wealth in Figure 5. We add two vertical lines for the net foreign asset position as a share of domestic wealth between -15% and $+15\%$. This corresponds, approximately, to a value range for the net foreign asset position in terms of GDP which lies between -30% and $+30\%$, approximately, as exhibited in Figure 5 by two horizontal lines[13]. When we test the regression equation (2) for the new rule for values of the net foreign asset position as a share of GDP between -30% and $+30\%$, the new rule receives a strong support, as shown by Table 4.

Therefore, we have shown that savings influence directly and partially current account balance. On the other hand, the new rule seems to hold well when the size of the net foreign asset position is "moderate". How can both views be reconciled? The size of the net foreign asset position is a key variable. To this issue we turn now.

3 A stylized model for a two-country world[14]

The world economy is composed of two countries, each of them producing only one homogeneous good. In each country there exists a representative agent with an infinite time horizon. The homogeneous good produced by both countries can be either consumed or invested in capital without having to incur in any kind of adjustment costs. There are two assets: domestic capital, and foreign capital. Unstarred variables refer to the domestic economy, whereas the starred variables refer to the foreign economy. Both domestic

[13]Please note that the correlation between both magnitudes is very high (not shown).

[14]Most of this section draws heavily from KV (2000), Achury et al. (2012), Turnovsky (1997, Ch. 11), and Erauskin (2009).

capital, K, and foreign capital, K^*, can be owned by the domestic representative agent or the foreign representative agent. The subscript d denotes the holdings of assets of the domestic representative agent and the subscript f denotes the holdings of assets of the foreign representative agent. So it must be satisfied that:

$$\begin{aligned} K &= K_d + K_f \\ K^* &= K_d^* + K_f^*. \end{aligned}$$

Domestic production is obtained using only domestic capital, K, through an AK function,

$$dY = \alpha K \cdot dt,$$

where $\alpha > 0$ is the marginal physical product of domestic capital. The term dY indicates the flow of production, instead of Y, as is ordinarily done in stochastic calculus.

Foreign production is carried out using capital domiciled abroad, K^*, and it is expressed through a first order stochastic differential equation, so that production flow dY is subject to a stochastic disturbance,

$$dY^* = \alpha^* K^* dt + K^* dy^*,$$

where $\alpha^* > 0$ is the marginal physical product of foreign capital. The term dy^* represents a proportional foreign productivity shock and it is the increment of a stochastic process y^*. Those increments are temporally independent and are distributed normally, satisfying that $E(dy^*) = 0$ and that $E(dy^{*^2}) = \sigma_{y^*}^2 dt$.[15] We omit, for convenience, formal references to time, although those variables depend on time.

The wealth of the domestic representative agent, W, and the wealth of the foreign representative agent, W^*, therefore will be:

$$\begin{aligned} W &= K_d + K_d^* \quad (3) \\ W^* &= K_f + K_f^*. \quad (4) \end{aligned}$$

[15] That is, the production flow follows a Brownian motion with drift $\alpha^* K^*$ and with variance $K^{*^2}\sigma_{y^*}^2$.

The preferences of the domestic representative agent are represented by a Stone-Geary intertemporal utility function where she obtains utility from consumption, C:

$$E_0 \int_0^{\infty} \frac{(C-\theta)^{1-\frac{1}{\gamma}} - 1}{1-\frac{1}{\gamma}} e^{-\beta t} dt;\ \theta, \gamma > 0;\ C > \theta, \tag{5}$$

The welfare of the domestic representative agent in period 0 is the expected value of the discounted sum of instantaneous utilities, conditioned on the set of disposable information in period 0. The parameter β is a positive subjective discount rate (or rate of time preference). The Arrow-Pratt coefficient of relative risk aversion is given by $\frac{C}{\gamma(C-\theta)}$. Thus, if $\theta > 0$, which is the more realistic case, consumers exhibit a decreasing degree of relative risk aversion[16].

The domestic representative agent consumes at a deterministic rate $C(t)dt$ in the instant dt. Thus, the dynamic budget restriction can be expressed in the following way:

$$dW = \left[\alpha K_d + \alpha^* K_d^*\right] dt + K_d^* dy^* - C dt. \tag{6}$$

If we define the following variables for the domestic representative agent:

$$\begin{aligned} n_d &\equiv \frac{K_d}{W} = \text{ share of the domestic portfolio materialized} \\ &\quad \text{in domestic capital} \\ n_d^* &\equiv \frac{K_d^*}{W} = \text{ share of the domestic portfolio materialized} \\ &\quad \text{in foreign capital,} \end{aligned}$$

equation (3) can be expressed more conveniently as:

$$1 = n_d + n_d^*, \tag{7}$$

and plugging (7) into the budget constraint (6) we obtain the following dynamic restriction for the resources of the domestic economy:

$$\frac{dW}{W} = \psi dt + dw, \tag{8}$$

[16] When $\theta = 0$ relative risk aversion is constant.

where the deterministic and stochastic parts of the rate of growth of assets, dW/W, can be expressed in the following way:

$$\psi \equiv \alpha n_d + \alpha^* n_d^* - \frac{C}{W} \tag{9}$$

$$dw \equiv n_d^* dy^*. \tag{10}$$

The objective of the domestic representative agent is to choose the path of consumption and portfolio shares that maximizes the expected value of the intertemporal utility function (5), subject to $W(0) = W_0$, (8), (9), and (10). This optimization is a stochastic optimum control problem. The equilibrium portfolio shares and the consumption-wealth ratio in the domestic open economy are given by equations (11) and (12)[17],

$$\frac{K_d}{W} = \frac{\gamma(\alpha - \alpha^*)}{\sigma_{y^*}^2}\left(1 - \frac{\theta/\alpha}{W}\right) + 1 \tag{11}$$

$$\frac{C}{W} = \left\{\gamma\beta - \frac{0.5\gamma(\gamma-1)(\alpha-\alpha^*)^2}{\sigma_{y^*}^2} - \alpha(\gamma-1)\right\} W + \frac{\theta\gamma}{\alpha}\left\{\alpha - \beta + \frac{0.5(\gamma-1)(\alpha-\alpha^*)^2}{\sigma_{y^*}^2}\right\}. \tag{12}$$

Equation (11) illustrates that the share of domestic wealth devoted to domestic capital decreases with wealth if and only if $\theta > 0$, because consumers exhibit decreasing relative risk aversion. This is a key result of our model. Equation (12) shows that consumption is partially linear in wealth, capturing substitution and income effects. When $\theta = 0$ and $\gamma = 1$, the classical logarithmic case applies, and portfolio shares depend only on assets characteristics, but not on the level of wealth, and the consumption function is linear in wealth.

In the foreign economy the equilibrium facing the foreign representative agent can be formulated in an analogous way in equations (13) and (14) as:

[17] To solve problems of stochastic optimum control see, for example, Kamien and Schwartz (1991, section 22), Malliaris and Brock (1982, ch. 2), Obstfeld (1992), or Turnovsky (1997, ch. 9; 2000, ch. 15). The reader is referred to KV (2000), Achury et al. (2012), Turnovsky (1997, Ch. 11), or Erauskin (2009) for the details on the equilibrium solution, to save space.

$$\frac{K_f}{W^*} = \frac{\gamma^*(\alpha-\alpha^*)}{\sigma^2_{y^*}}\left(1-\frac{\theta^*/\alpha}{W^*}\right) \tag{13}$$

$$\frac{C^*}{W^*} = \left\{\gamma^*\beta^* - \frac{0.5\gamma^*(\gamma^*-1)(\alpha-\alpha^*)^2}{\sigma^2_{y^*}} - \alpha(\gamma^*-1)\right\}W^* + \frac{\theta^*\gamma^*}{\alpha}\left\{\alpha-\beta^*+\frac{0.5(\gamma^*-1)(\alpha-\alpha^*)^2}{\sigma^2_{y^*}}\right\}. \tag{14}$$

The net foreign asset position for the domestic economy, P, is defined as:

$$P = K^*_d - K_f, \tag{15}$$

where changes in any of those variables lead to changes in the net foreign asset position.

The current account of the domestic economy, CA, is defined as the variation in its net foreign asset position given by (15), dP. Then we have that:

$$CA = dP = dK^*_d - dK_f. \tag{16}$$

We can convert equation (16), after a bit of algebra, into:

$$CA = dW - dK = \left[1-\frac{\partial K_d}{\partial W}\right]dW - \frac{\partial K_f}{\partial W^*}dW^*. \tag{17}$$

Thus, equation (17) is the national account identity, where the current account balance is equal to the variation in domestic wealth minus the variation in domestic capital. Please note that the variation in domestic wealth, dW, is equal to the national savings for the period, S, that is, national income minus consumption. Additionally, the variation in domestic capital, dK, is equal to the domestic net investment for the period.

How do countries react? In case the domestic capital is subject to diminishing returns[18], i.e., $\frac{\partial\alpha}{\partial K_d} < 0$, totally differentiating equation (11), we obtain:

[18]See Corsetti (1997), for instance. Aggregate capital stock has an external effect on labor productivity, but the representative firm faces decreasing returns to capital in a stochastic Arrow-Romer model.

$$\frac{\partial K_d}{\partial W} = \frac{\sigma^2_{y^*}}{\sigma^2_{y^*} - \gamma \frac{\partial \alpha}{\partial K_d}\left(W - \frac{\theta}{\alpha}\right)} \left(\frac{K_d}{W - \frac{\theta}{\alpha}}\right) \tag{18}$$

This is a familiar result already found in Kraay and Ventura (2000). When $\left(\partial\alpha/\partial K_d\right)/\sigma^2_{y^*} \longrightarrow -\infty$, i.e., the risk associated with investment is low compared to the diminishing returns effect, the marginal unit of wealth is not invested in domestic capital, i.e.,

$$\frac{\partial K_d}{\partial W} \to 0. \tag{19}$$

The marginal unit of wealth is invested in foreign bonds. Since a small open economy implies that foreign holdings of domestic capital are constant, i.e., $dK_f = 0$, combining equations (17), and (19), the traditional rule applies:

$$CA = dW, \tag{20}$$

that is, the impact of a transitory income shock on the current account is given by the amount of savings generated by the shock.

When $\left(\partial\alpha/\partial K_d\right)/\sigma^2_{y^*} \longrightarrow 0$, i.e., risk associated with investment is high compared to the diminishing returns effect, the marginal unit of wealth is invested as a fraction of the average unit of wealth,

$$\frac{\partial K_d}{\partial W} \to \frac{K_d}{W - \frac{\theta}{\alpha}}. \tag{21}$$

Equation (21) implies that increasing wealth induces consumers to invest a smaller share of their portfolio in domestic wealth. If $\theta = 0$, the marginal unit of wealth is invested as the average unit of wealth:

$$\frac{\partial K_d}{\partial W} = \frac{K_d}{W}. \tag{22}$$

Equation (22), combined with equations (17) and (19), lead to the new rule, i.e., the impact of a transitory income shock on the current account is given by the amount of savings generated by the shock multiplied by the ratio of the net foreign asset position to domestic wealth:

$$CA = \left(\frac{P}{W}\right) dW. \tag{23}$$

However, when $\theta > 0$, the new rule is not necessarily true.

To go further, and to simplify notation, we can conveniently assume, without loss of generalization, that the marginal unit of wealth invested in domestic capital is a fraction of the average unit of wealth invested in domestic capital, i.e.,

$$\frac{\partial K_d}{\partial W} = \lambda \frac{K_d}{W}, \tag{24}$$

where λ reflects the degree of portfolio adjustment in the domestic economy[19]. If $\lambda = 0$ then the traditional rule applies: the marginal unit of wealth invested in domestic capital is 0. Instead, it is completely invested abroad. On the other hand, if $\lambda = 1$ then the marginal unit of wealth is invested as the average, i.e., the new view applies.

We assume analogously that the fraction of the marginal unit of foreign wealth invested in domestic capital is a fraction of the average unit of foreign wealth invested in domestic capital, i.e.,

$$\frac{\partial K_f}{\partial W^*} = \mu \frac{K_f}{W^*}, \tag{25}$$

where μ captures the degree of portfolio adjustment in the foreign economy.

Plugging equations (24) and (25) into equation (17) we get that the impact of a transitory income shock on the current account is given by:

$$CA = (1 - \lambda)\, dW + \lambda \frac{K_d^*}{W} dW - \mu \frac{K_f}{W^*} dW^*, \tag{26}$$

where different values for the parameters λ and μ lead to different results. Equation (26) is a combination of the traditional rule and the new view, and it is going to be tested in Section 5 below. For instance, when $\lambda = \mu = 0$ the traditional rule applies. When $\lambda = \mu = 1$ the new view applies for the world economy. Please note that equation (26) captures changes both in the deterministic and stochastic terms of domestic and foreign wealth, as shown by (8), (9), and (10).

Equation (26) can be rearranged, after some algebra, as:

$$CA = (1 - \lambda)\, dW + \lambda \frac{P}{W} dW - K_f \left(\mu \frac{dW^*}{W^*} - \lambda \frac{dW}{W} \right). \tag{27}$$

[19] This idea was already suggested by Kraay and Ventura (2000).

Equation (27) reflects three terms. The first term is related to the traditional rule, the second term to the new rule, and the third to the impact of the foreign economy. If the new view holds in both countries, i.e., $\lambda = \mu = 1$, then, after some algebra, equation (27) implies:

$$CA = \left(\frac{P}{W}\right) dW - K_f \left(\frac{dW^*}{W^*} - \frac{dW}{W}\right), \tag{28}$$

Expression (28) is equal to the new rule plus an additional term[20]. Additionally, if the growth rates in both countries are equal, i.e., $\frac{dW^*}{W^*} = \frac{dW}{W}$, then equation (28) is converted into:

$$CA = \left(\frac{P}{W}\right) dW, \tag{29}$$

Equation (29) is the new rule, i.e., the impact of a transitory income shock on the current account is equal to the amount of savings multiplied by the ratio of the net foreign asset position over wealth.

However, if both countries grow at the same rate and portfolio adjustment parameters are equal but less than 1, i.e., $\frac{dW^*}{W^*} = \frac{dW}{W}$ and $\lambda = \mu \neq 1$, then

$$CA = (1 - \lambda)\, dW + \lambda \frac{P}{W} dW. \tag{30}$$

Equation (30) is a combination of the traditional rule and the new rule, and it is going to be tested in Section 5 below.

4 Data sources

The data set employed to test the main results of the model covers 50 industrial and developing countries for the period 1970-2009. 22 are industrial countries, such as Austria, Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, The Netherlands, Norway, New Zealand, Spain, Portugal, Sweden, Switzerland, United Kingdom, and the United States. 28 are developing countries, such as Argentina, Brazil, Czech Republic, Chile, China, Colombia, Costa Rica, Guatemala,

[20] This is a result already found in Erauskin (2004). However, equation (27) makes more explicit gross and net foreign asset positions.

Honduras, Hungary, India, Indonesia, Israel, Jamaica, Korea, Malaysia, Mexico, Pakistan, Philippines, Poland, Singapore, Slovak Republic, South Africa, Thailand, Tunisia, Turkey, Uruguay, and Venezuela. The data on GDP and gross domestic savings for those countries are provided directly by World Bank's World Development Indicators (WBWDI). The data on current accounts and international investment positions have been obtained from the International Monetary Fund´s International Financial Statistics (IMFIFS). Additionally, as data on international investment positions are incomplete or missing for many countries (specially before 1980-1986), Lane and Milesi-Ferretti (2001, 2007)[21] provide an excellent source of data for those years[22]. Domestic holdings of foreign assets, K_d^*, is the sum of domestic holdings of foreign capital (measured as direct plus portfolio equity investment by domestic agents abroad), assets in portfolio debt investment, other investment assets (general government, banks, and others), reserve assets (minus gold) and assets in financial derivatives. Foreign holdings of domestic assets, K_f, refers to the sum of foreign holdings of domestic capital (direct plus portfolio equity investment by foreign agents in the domestic economy), liabilities in portfolio debt investment, liabilities in other investment assets (general government, banks, and others), and liabilities in financial derivatives. The net foreign asset position, P, is the difference between assets, K_d^*, minus liabilities, K_f. The gross domestic capital stock in current US dollars for the countries in the sample is constructed using the procedure suggested by Kraay and Ventura (2000) in their Appendix 2[23]: gross domestic investment in current US dollars (from WBWDI) is cumulated assuming a depreciation rate of 4% per year, and adjusting the value of previous year's stock using the US gross domestic investment deflator. The initial capital stock in 1970 is estimated using the average capital-output ratio over the period 1965-1970 [based on Nehru and Dareshwar (1993)] multiplied by GDP in current US dollars (WBWDI). Domestic wealth, W, is then constructed adding the net foreign asset position, P, to domestic wealth. The series for the foreign economy are estimated as follows: we take the values for the whole world and then the values for the domestic economy are subtracted from it.

[21] We will refer to Lane and Milesi-Ferretti (2007) only from here onwards, as this is the most recent database we are using, in fact.

[22] Please note that most of the data from IMFIFS, and from Lane and Milesi-Ferretti (2007) coincide for recent years.

[23] See also Erauskin (2009) for more details.

5 Results

First, equation (26) provides a testable regression for a combined view of the traditional rule and the new view of the current account:

$$CA_{ct} = a_0 + a_1 S_{ct} + a_2 \left(\frac{K^*_{d,ct}}{W_{ct}} \right) S_{ct} + a_3 \left(\frac{K_{f,ct}}{W^*_{ct}} \right) S^*_{ct} + u_{ct}. \qquad (31)$$

where S_{ct} and S^*_{ct} denote the amount of domestic and foreign savings, respectively, expressed as a share of GDP, for country c in period t, and u_{ct} is the error term for country c in period t. Under the null hypothesis that the current account follows the new view, then the parameters in regression (31) should be equal to $a_1 = 0$, $a_2 = 1$, and $a_3 = 1$. The traditional rule would imply that $a_1 = 1$, $a_2 = 0$, and $a_3 = 0$. Of course, results may also lie somewhere in between. Table 5 exhibits the results when the net foreign asset position in terms of domestic wealth is between -15% and $+15\%$.[24] The new view dominates, and investment in foreign assets reacts to domestic savings more strongly than foreign investment (liabilities) to foreign savings, i.e., $a_2 > a_3$. In addition, the combination of the traditional rule and the new view receives a strong support, but this is not complete, because $a_1 + a_2$ does not add up to 1, and a_3 is not equal to 1. The support is much stronger when the net foreign asset position in terms of GDP is between -30% and $+30\%$, as shown in Table 6, because now $a_1 + a_2$ adds up to 1, except for the between, and a_3 is a bit closer to 1, especially for the between.

Things turn upside down when the net foreign asset position in terms of domestic wealth is higher than $+15\%$. [25]Table 7 shows the results. Then the traditional rule dominates completely, while the support for the new view almost disappears. This result is confirmed in Table 8 when the net foreign asset position in terms of GDP is higher than $+30\%$. This may well reflect less risk aversion when the country is a "big" creditor. On the other hand, when the net foreign asset position in terms of domestic wealth is lower than -15%, i.e., the country is a "big" debtor, then we find that the traditional rule receives more support than the new view in the pooled and within estimations, but the support received is not as strong as for the big

[24]Please note that observations associated to "big" positions in foreign assets are not included in this group.

[25]Please note that this group includes observations with "big" positions in foreign assets, i.e., an amount of gross foreign assets higher than domestic wealth, because they are similar.

creditor case. Table 9 captures the results. However, the new view dominates in the between estimation. This result is also reinforced when we look at net foreign asset positions lower than -30% in terms of GDP, as in Table 10. Thus, the adjustment process seems to be very different in the debtor case from the creditor case, which is not surprising, because debtors' positions usually imply stronger financing constraints.

Second, we test the combination of the traditional rule and the new rule, which is suggested by equation (30):

$$CA_{ct} = a_0 + a_1 S_{ct} + a_2 \left(\frac{P_{ct}}{W_{ct}} \right) S_{ct}. \tag{32}$$

Table 11 shows the results for "moderate" values of the net foreign asset position as a share of domestic wealth, i.e., between -15% and $+15\%$. The new rule emerges strongly, whereas the traditional rule plays a minor role[26], except for the between estimation. This domination is also true for "moderate" values of the net foreign asset position, i.e., between -30% and $+30\%$ in terms of GDP, as shown in Table 12. In the case of "big" creditor countries, i.e., the net foreign asset position as a share of domestic wealth is higher than $+15\%$, the traditional rule receives a strong support, with values for the parameter a_1 closer to 1, as captured by Table 13, whereas the new rule does not receive much support. This is also true for "big" creditor countries, in terms of GDP, i.e., values of the net foreign asset position as a share of GDP higher than $+30\%$, as exhibited by Table 14. Instead, in the case of "big" debtor countries, i.e., when the net foreign asset position as a share of domestic wealth is lower than -15%, the traditional rule receives more support than the new rule in regression equation (32), as shown in Table 15. Table 16 confirms the results for "big" debtor countries in terms of GDP, i.e., when the net foreign asset position as a share of GDP is lower than -30%. Thus, the size of the net foreign asset position is again a key variable to explain current account dynamics.

Equation (32), which encompasses the traditional rule and the new rule, was already suggested by Coeurdacier and Ordeñana (2005)[27], and it was found that equation (32) fitted the data quite satisfactorily for he entire sample of 53 countries (21 industrial countries and 32 developing countries)

[26] In addition, the null hypothesis that $a_1 + a_2 = 1$ cannot be rejected (not shown).

[27] This work has not been published. In fact, it is not available in the web right now either.

for the period 1970-1997. However, we should note that equation (32) is almost the same regression suggested by Kraay and Ventura (2002) to analyze the short run behavior of current accounts. To see this, we depart from the portfolio rebalancing term, PR_{ct}, which is defined as the deviation from the new rule,

$$PR_{ct} = CA_{ct} - S_{ct} \times \frac{P_{ct}}{W_{ct}}, \tag{33}$$

for country c at time t. Kraay and Ventura (2002) then regressed the portfolio rebalancing term on savings:

$$PR_{ct} = \rho S_{ct} + Additional\ terms, \tag{34}$$

where ρ is a parameter. Combining equations (33) and (34) the current account balance is given by

$$CA_{ct} = \rho S_{ct} + S_{ct} \times \frac{P_{ct}}{W_{ct}} + Additional\ terms. \tag{35}$$

Equation (35) is very similar to equation (32), except for the parameter a_2 (instead of 1), and the additional terms[28]. Please note that this is not discard the importance of those additional terms, as fundamental as they are, but to see more clearly why both equations resemble each other very much, even though they are not identical.

Summing up, both the combination of the traditional rule and the new view, and the combination of the traditional rule and the new rule share many features in common.

6 Conclusions

The traditional rule, the new view, and the new rule provide a satisfactory framework to explain the behavior of current accounts when transitory income shocks occur, once the size of the net foreign asset position is considered. Thus, when the net foreign asset position is moderate, i.e., between -15% and $+15\%$ as a share of domestic wealth or between -15% and $+15\%$ as a share of GDP, the combination of the new view and the traditional rule receives a strong support: the new view dominates and the traditional

[28]However, please also note that while in equation (31) all the coefficients have to be estimated, equation (35) assumes that the new rule holds perfectly.

rule plays a minor role. This also applies when the new rule and the traditional rule are combined. On the other hand, for big creditor countries, i.e., when the net foreign asset position is higher than 15% as a share of domestic wealth or 30% as a share of GDP, the traditional rule dominates. Finally, for big debtor countries, i.e., when the net foreign asset position is lower than -15% as a share of wealth or -30% as a share of GDP, the traditional rule receives more support than the new view, or the new rule, but its impact is less stronger than for the big creditor countries. However, despite these results provide a fruitful characterization of the behavior of current accounts, further research is much needed to see how robust these results will remain in the future given the current economic and financial turmoil.

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Table 1: The traditional rule

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.345***	0.312***	0.409***	0.337***	0.330***	0.432***
	(0.0189)	(0.0505)	(0.0857)	(0.0200)	(0.0582)	(0.0753)
Population				1.16e-11***	2.84e-11	-1.45e-10***
				(4.45e-12)	(1.87e-11)	(4.37e-11)
Population growth				-0.000129	0.00383	-0.0123***
				(0.00180)	(0.00440)	(0.00458)
GDP per capita				1.15e-06***	1.30e-06***	1.03e-06
				(1.63e-07)	(4.00e-07)	(2.04e-06)
GDP per capita growth				-0.00190***	-0.00493	-0.00171***
				(0.000374)	(0.00319)	(0.000427)
Time trend				0.000609***		0.000674
				(0.000110)		(0.000418)
R^2	0.270	0.443	0.167	0.361	0.611	0.262
No. of observations	1722	50	1722	1715	50	1715

Robust standard errors are in parenthesis.

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.

Sources: International Monetary Fund´s International Financial Statistics (IMFIFS), World Bank´s World Development Indicatos (WBWDI), Lane and Milesi-Ferretti (2007), Nehru and Dareshwar (1993), and own elaboration.

Table 2: The new rule

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.415***	0.368***	0.548***	0.386***	0.291***	0.565***
	(0.0249)	(0.0639)	(0.0301)	(0.0251)	(0.0730)	(0.0299)
Population				2.82e-11***	2.78e-11	-7.19e-11**
				(4.11e-12)	(2.15e-11)	(3.44e-11)
Population growth				-0.00422***	0.000623	-0.0109***
				(0.00163)	(0.00541)	(0.00239)
GDP per capita				7.20e-07***	1.15e-06**	2.79e-07
				(1.83e-07)	(5.04e-07)	(4.61e-07)
GDP per capita growth				-0.000501	0.00162	-0.000512*
				(0.000409)	(0.00314)	(0.000289)
Time trend				0.000778***		0.000960***
				(0.000115)		(0.000167)
R^2	0.246	0.409	0.166	0.323	0.513	0.258
No. of observations	1709	50	1709	1702	50	1702

Robust standard errors are in parenthesis.

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.

Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 3: The new rule for "moderate" net foreign asset positions

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	1.026***	0.747**	1.002***	0.963***	0.724*	0.956***
	(0.121)	(0.293)	(0.107)	(0.132)	(0.386)	(0.102)
Population				0.00143	-0.00283	-0.0739**
				(0.00507)	(0.0270)	(0.0307)
Population growth				0.00111	0.00425	-0.00819***
				(0.00196)	(0.00694)	(0.00309)
GDP per capita				0.352**	0.865	-0.0913
				(0.175)	(0.626)	(0.565)
GDP per capita growth				0.000119	0.00570	-0.000559
				(0.000540)	(0.00370)	(0.000351)
Time trend				0.000982***		0.00101***
				(0.000141)		(0.000211)
R^2	0.127	0.134	0.087	0.198	0.225	0.187
No. of observations	974	44	974	973	44	973

Robust standard errors are in parenthesis.

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.

Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 4: The new rule for "moderate" net foreign asset positions (in terms of GDP)

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	1.125***	1.109***	1.128***	1.120***	0.953**	1.156***
	(0.116)	(0.309)	(0.121)	(0.145)	(0.451)	(0.115)
Population				0.00180	0.0103	-0.0815***
				(0.00524)	(0.0256)	(0.0299)
Population growth				0.000103	-0.000816	-0.00714**
				(0.00200)	(0.00633)	(0.00314)
GDP per capita				0.366**	0.619	-0.665
				(0.183)	(0.553)	(0.579)
GDP per capita growth				0.000303	0.00169	-0.000381
				(0.000579)	(0.00342)	(0.000372)
Time trend				0.000878***		0.00119***
				(0.000143)		(0.000216)
R^2	0.142	0.231	0.094	0.211	0.278	0.205
No. of observations	878	45	878	877	45	877

Robust standard errors are in parenthesis.

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.

Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 5: The traditional rule and the new view for "moderate" net foreign asset positions

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.187***	0.204**	0.206***	0.242***	0.238**	0.293***
	(0.0198)	(0.0826)	(0.0320)	(0.0210)	(0.101)	(0.0335)
Estimate of a_2	0.712***	0.662**	0.662***	0.681***	0.644**	0.607***
	(0.0634)	(0.291)	(0.0683)	(0.0631)	(0.316)	(0.0713)
Estimate of a_3	-0.442***	-0.398	-0.397***	-0.495***	-0.407	-0.442***
	(0.0684)	(0.339)	(0.0713)	(0.0668)	(0.359)	(0.0687)
Population				-0.0111**	0.00215	-0.162***
				(0.00480)	(0.0189)	(0.0284)
Population growth				0.000913	0.00400	-0.0139***
				(0.00135)	(0.00523)	(0.00277)
GDP per capita				0.0985	0.337	-0.593
				(0.134)	(0.489)	(0.538)
GDP per capita growth				-0.00219***	-0.00182	-0.00189***
				(0.000342)	(0.00298)	(0.000318)
Time trend				0.000391***		0.000606***
				(0.000113)		(0.000202)
R^2	0.414	0.554	0.296	0.451	0.579	0.371
No. of observations	974	44	974	973	44	973

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 6: The traditional rule and the new view for "moderate" net foreign asset positions (in terms of GDP)

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.163***	0.125	0.180***	0.223***	0.213**	0.260***
	(0.0203)	(0.0773)	(0.0344)	(0.0220)	(0.0880)	(0.0354)
Estimate of a_2	0.823***	1.239***	0.802***	0.783***	1.164***	0.747***
	(0.0744)	(0.336)	(0.0819)	(0.0734)	(0.339)	(0.0810)
Estimate of a_3	-0.563***	-0.955**	-0.548***	-0.602***	-0.950**	-0.552***
	(0.0796)	(0.384)	(0.0850)	(0.0779)	(0.384)	(0.0828)
Population				-0.00758	0.0116	-0.158***
				(0.00475)	(0.0148)	(0.0277)
Population growth				0.000204	0.00285	-0.0121***
				(0.00132)	(0.00395)	(0.00284)
GDP per capita				0.105	0.390	-1.495***
				(0.138)	(0.387)	(0.550)
GDP per capita growth				-0.00235***	-0.00556**	-0.00180***
				(0.000353)	(0.00212)	(0.000338)
Time trend				0.000336***		0.000752***
				(0.000109)		(0.000208)
R^2	0.418	0.628	0.307	0.458	0.717	0.384
No. of observations	878	45	878	877	45	877

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 7: The traditional rule and the new view for "big" creditor countries

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	1.001***	0.785***	1.344***	0.902***	-0.0607	0.754***
	(0.0802)	(0.141)	(0.111)	(0.0837)	(1.453)	(0.0947)
Estimate of a_2	-0.0623***	-0.0682**	-0.0430***	-0.0104	0.00522	-0.00277
	(0.0110)	(0.0230)	(0.0153)	(0.0103)	(0.135)	(0.0109)
Estimate of a_3	0.186***	0.00375	0.199***	-0.0320	-0.253	-0.144***
	(0.0333)	(0.0661)	(0.0347)	(0.0319)	(0.436)	(0.0372)
Population				0.751***	-1.250	5.004
				(0.248)	(2.671)	(8.895)
Population growth				-0.00837**	0.0298	-0.0156***
				(0.00410)	(0.0363)	(0.00428)
GDP per capita				2.267***	3.114	7.523***
				(0.547)	(3.437)	(1.710)
GDP per capita growth				0.000603	-0.00584	-0.000154
				(0.00100)	(0.0112)	(0.00108)
Time trend				0.00411***		0.00314***
				(0.000439)		(0.000958)
R^2	0.600	0.877	0.671	0.867	0.912	0.875
No. of observations	121	12	121	121	12	121

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 8: The traditional rule and the new view for "big" creditor countries (in terms of GDP)

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.823***	0.239	1.337***	0.805***	0.733***	0.761***
	(0.0729)	(0.148)	(0.107)	(0.0567)	(0.186)	(0.0923)
Estimate of a_2	-0.0475***	-0.000745	-0.0467***	-0.0139	-0.0512	-0.00815
	(0.0104)	(0.0347)	(0.0147)	(0.00893)	(0.0338)	(0.0104)
Estimate of a_3	0.143***	-0.0884	0.160***	-0.0255	0.0684	-0.170***
	(0.0317)	(0.110)	(0.0322)	(0.0245)	(0.112)	(0.0344)
Population				-0.156***	-0.0507	-0.203
				(0.0247)	(0.0900)	(4.795)
Population growth				-0.00769*	0.0229	-0.0149***
				(0.00432)	(0.0393)	(0.00424)
GDP per capita				1.277***	1.077	6.220***
				(0.455)	(1.354)	(1.559)
GDP per capita growth				0.000414	-0.00889	-0.000339
				(0.000999)	(0.00857)	(0.000983)
Time trend				0.00452***		0.00431***
				(0.000411)		(0.000840)
R^2	0.509	0.475	0.628	0.823	0.856	0.854
No. of observations	142	14	142	142	14	142

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 9: The traditional rule and the new view for "big" debtor countries

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.280***	0.161	0.346***	0.303***	0.209*	0.381***
	(0.0289)	(0.105)	(0.0378)	(0.0296)	(0.119)	(0.0404)
Estimate of a_2	0.124***	0.490**	-0.0272	0.113***	0.442**	0.0357
	(0.0396)	(0.219)	(0.0415)	(0.0384)	(0.212)	(0.0429)
Estimate of a_3	-0.188***	-0.493**	-0.00290	-0.197***	-0.520**	-0.0529
	(0.0493)	(0.229)	(0.0528)	(0.0482)	(0.222)	(0.0519)
Population				0.216***	0.207*	0.0821
				(0.0329)	(0.109)	(0.169)
Population growth				-0.00884***	-0.00383	-0.0162***
				(0.00210)	(0.00663)	(0.00493)
GDP per capita				0.890***	1.389*	-2.163
				(0.232)	(0.686)	(1.605)
GDP per capita growth				-0.00239***	-0.00253	-0.00248***
				(0.000451)	(0.00410)	(0.000424)
Time trend				-0.000136		0.000307
				(0.000181)		(0.000357)
R^2	0.195	0.268	0.141	0.307	0.422	0.234
No. of observations	612	35	612	606	35	606

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 10: The traditional rule and the new view for "big" debtor countries (in terms of GDP)

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.306***	0.161	0.384***	0.349***	0.208*	0.424***
	(0.0284)	(0.0979)	(0.0376)	(0.0290)	(0.106)	(0.0392)
Estimate of a_2	0.187***	0.518*	-0.0422	0.157***	0.499*	-0.0440
	(0.0568)	(0.271)	(0.0616)	(0.0562)	(0.286)	(0.0605)
Estimate of a_3	-0.242***	-0.517*	0.0128	-0.242***	-0.534*	0.000814
	(0.0622)	(0.276)	(0.0684)	(0.0609)	(0.287)	(0.0667)
Population				0.0944***	0.0303	0.0435
				(0.0219)	(0.0294)	(0.189)
Population growth				-0.00682***	-0.00150	-0.0185***
				(0.00206)	(0.00607)	(0.00457)
GDP per capita				0.662***	0.746	-0.0375
				(0.225)	(0.636)	(1.367)
GDP per capita growth				-0.00247***	-0.00334	-0.00262***
				(0.000437)	(0.00388)	(0.000404)
Time trend				6.57e-05		0.000232
				(0.000175)		(0.000315)
R^2	0.218	0.270	0.159	0.294	0.343	0.249
No. of observations	687	37	687	681	37	681

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 11: The traditional rule and the new rule for "moderate" net foreign asset positions

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.283***	0.297***	0.354***	0.348***	0.362***	0.433***
	(0.0167)	(0.0608)	(0.0277)	(0.0176)	(0.0820)	(0.0270)
Estimate of a_2	0.747***	0.437*	0.793***	0.751***	0.222	0.723***
	(0.0776)	(0.244)	(0.0998)	(0.0761)	(0.337)	(0.0913)
Population				-0.0278***	-0.00600	-0.191***
				(0.00485)	(0.0222)	(0.0281)
Population growth				0.00196	0.000792	-0.0104***
				(0.00138)	(0.00575)	(0.00274)
GDP per capita				0.193	0.359	0.173
				(0.132)	(0.526)	(0.500)
GDP per capita growth				-0.00185***	-0.00272	-0.00172***
				(0.000349)	(0.00358)	(0.000319)
Time trend				0.000917***		0.000985***
				(9.99e-05)		(0.000186)
R^2	0.326	0.453	0.224	0.430	0.493	0.365
No. of observations	974	974	974	973	973	973

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 12: The traditional rule and the new rule for "moderate" net foreign asset positions (in terms of GDP)

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.264***	0.280***	0.336***	0.339***	0.395***	0.412***
	(0.0168)	(0.0580)	(0.0297)	(0.0178)	(0.0743)	(0.0292)
Estimate of a_2	0.869***	0.920***	0.815***	0.892***	0.503	0.781***
	(0.0839)	(0.253)	(0.116)	(0.0825)	(0.356)	(0.106)
Population				-0.0263***	-0.00246	-0.186***
				(0.00474)	(0.0198)	(0.0279)
Population growth				0.00164	-0.00127	-0.00792***
				(0.00135)	(0.00485)	(0.00282)
GDP per capita				0.184	0.170	-0.529
				(0.132)	(0.433)	(0.520)
GDP per capita growth				-0.00182***	-0.00593*	-0.00159***
				(0.000361)	(0.00299)	(0.000345)
Time trend				0.000933***		0.00121***
				(9.77e-05)		(0.000194)
R^2	0.332	0.505	0.215	0.444	0.586	0.359
No. of observations	878	45	878	877	45	877

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 13: The traditional rule and the new rule for "big" creditor countries

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.647***	0.892***	0.247	0.751***	1.061**	0.674***
	(0.121)	(0.139)	(0.160)	(0.0863)	(0.276)	(0.132)
Estimate of a_2	-0.0252	-0.286**	0.639***	0.104**	-0.383*	0.145
	(0.0704)	(0.0951)	(0.0891)	(0.0479)	(0.161)	(0.0876)
Population				0.603**	0.714	-4.738
				(0.238)	(0.657)	(9.174)
Population growth				-0.0161***	0.0251	-0.0169***
				(0.00402)	(0.0216)	(0.00456)
GDP per capita				2.665***	1.215	5.860***
				(0.453)	(1.057)	(1.774)
GDP per capita growth				-0.000474	-0.00339	-5.57e-05
				(0.000954)	(0.00468)	(0.00120)
Time trend				0.00359***		0.00228**
				(0.000372)		(0.000970)
R^2	0.440	0.837	0.707	0.868	0.923	0.855
No. of observations	121	12	121	121	12	121

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 14: The traditional rule and the new rule for "big" creditor countries (in terms of GDP)

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.501***	0.317**	0.319**	0.683***	0.761***	0.642***
	(0.0940)	(0.128)	(0.146)	(0.0655)	(0.146)	(0.129)
Estimate of a_2	0.0419	-0.0210	0.586***	0.0935**	-0.231*	0.196**
	(0.0572)	(0.139)	(0.0809)	(0.0428)	(0.119)	(0.0846)
Population				-0.112***	-0.0432	-2.603
				(0.0251)	(0.0699)	(5.317)
Population growth				-0.0161***	0.0284	-0.0168***
				(0.00412)	(0.0319)	(0.00471)
GDP per capita				1.667***	1.194	2.779*
				(0.421)	(1.162)	(1.626)
GDP per capita growth				-0.000361	-0.0101	0.000303
				(0.000952)	(0.00543)	(0.00115)
Time trend				0.00407***		0.00330***
				(0.000377)		(0.000906)
R^2	0.411	0.424	0.681	0.822	0.870	0.816
No. of observations	142	14	142	142	14	142

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 15: The traditional rule and the new rule for "big" debtor countries

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.371***	0.302**	0.377***	0.384***	0.309**	0.419***
	(0.0286)	(0.114)	(0.0364)	(0.0307)	(0.141)	(0.0382)
Estimate of a_2	0.303***	0.292	0.230***	0.289***	0.153	0.289***
	(0.0501)	(0.263)	(0.0536)	(0.0512)	(0.284)	(0.0540)
Population				0.197***	0.213*	-0.0743
				(0.0331)	(0.122)	(0.166)
Population growth				-0.00878***	-0.00432	-0.0139***
				(0.00206)	(0.00734)	(0.00479)
GDP per capita				0.573***	0.994	-2.510**
				(0.220)	(0.686)	(1.068)
GDP per capita growth				-0.00209***	-0.00146	-0.00242***
				(0.000438)	(0.00437)	(0.000405)
Time trend				7.58e-05		0.000839**
				(0.000183)		(0.000352)
R^2	0.221	0.182	0.162	0.319	0.309	0.270
No. of observations	612	35	612	606	35	606

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Table 16: The traditional rule and the new rule for "big" debtor countries (in terms of GDP)

	Pooled regression	Between regression	Within regression	Pooled regression	Between regression	Within regression
Estimate of a_1	0.397***	0.346***	0.411***	0.428***	0.358***	0.445***
	(0.0268)	(0.0883)	(0.0350)	(0.0278)	(0.106)	(0.0361)
Estimate of a_2	0.332***	0.563**	0.240***	0.342***	0.516**	0.280***
	(0.0486)	(0.215)	(0.0525)	(0.0506)	(0.252)	(0.0538)
Population				0.0833***	0.0173	-0.101
				(0.0217)	(0.0302)	(0.186)
Population growth				-0.00667***	-0.00399	-0.0161***
				(0.00201)	(0.00606)	(0.00450)
GDP per capita				0.352*	0.310	-1.354
				(0.212)	(0.589)	(1.034)
GDP per capita growth				-0.00213***	-0.000944	-0.00245***
				(0.000424)	(0.00366)	(0.000390)
Time trend				0.000325*		0.000725**
				(0.000175)		(0.000314)
R^2	0.250	0.325	0.181	0.317	0.354	0.277
No. of observations	687	37	687	681	37	681

Robust standard errors are in parenthesis.
*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level.
Sources: IMFIFS, WBWDI, Lane and Milesi-Ferretti (2007), Nehru and Dhareshwar (1993), and own elaboration.

Figure 1: The traditional rule

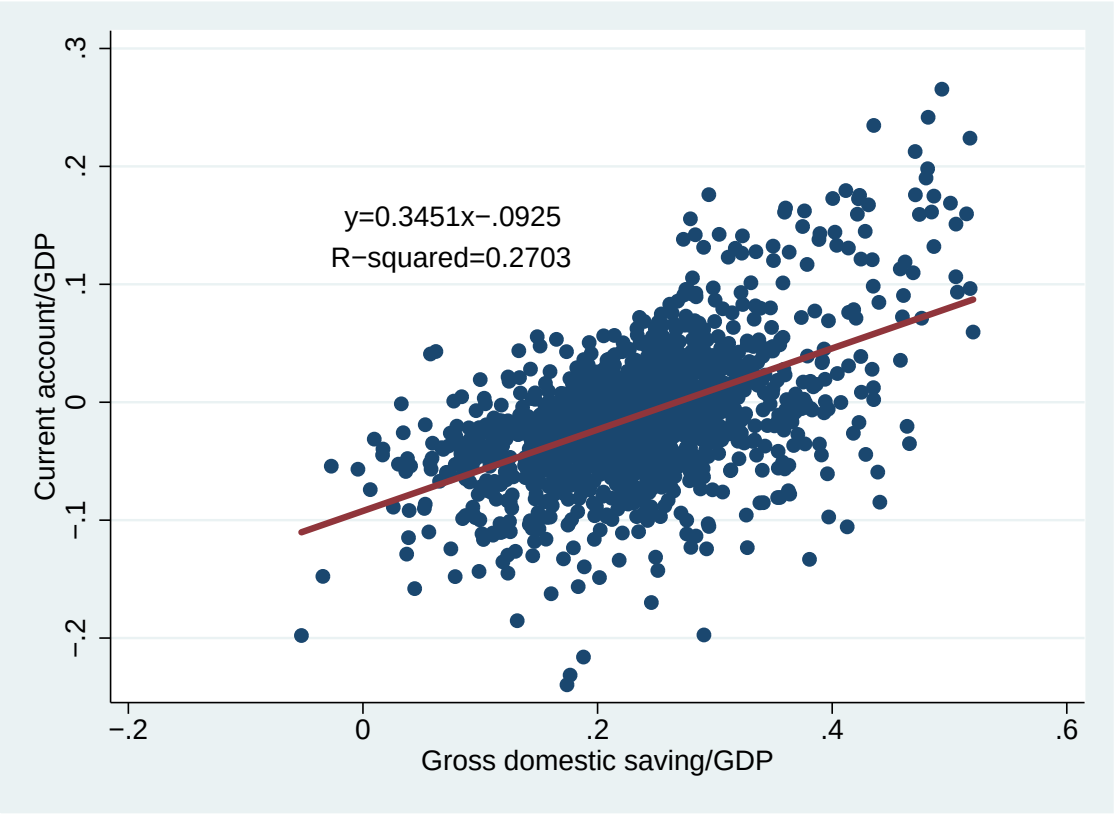

Figure 2: The new rule

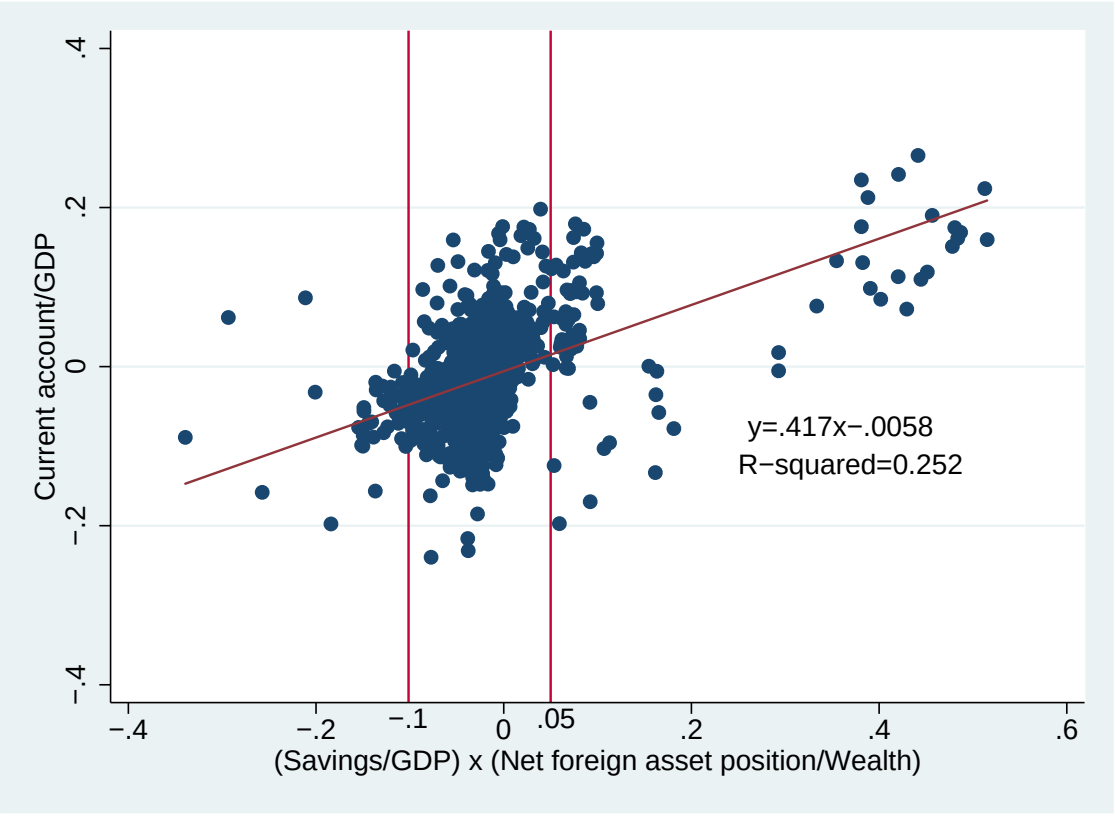

Figure 3: The relationship between the net foreign asset position and the term capturing the new rule

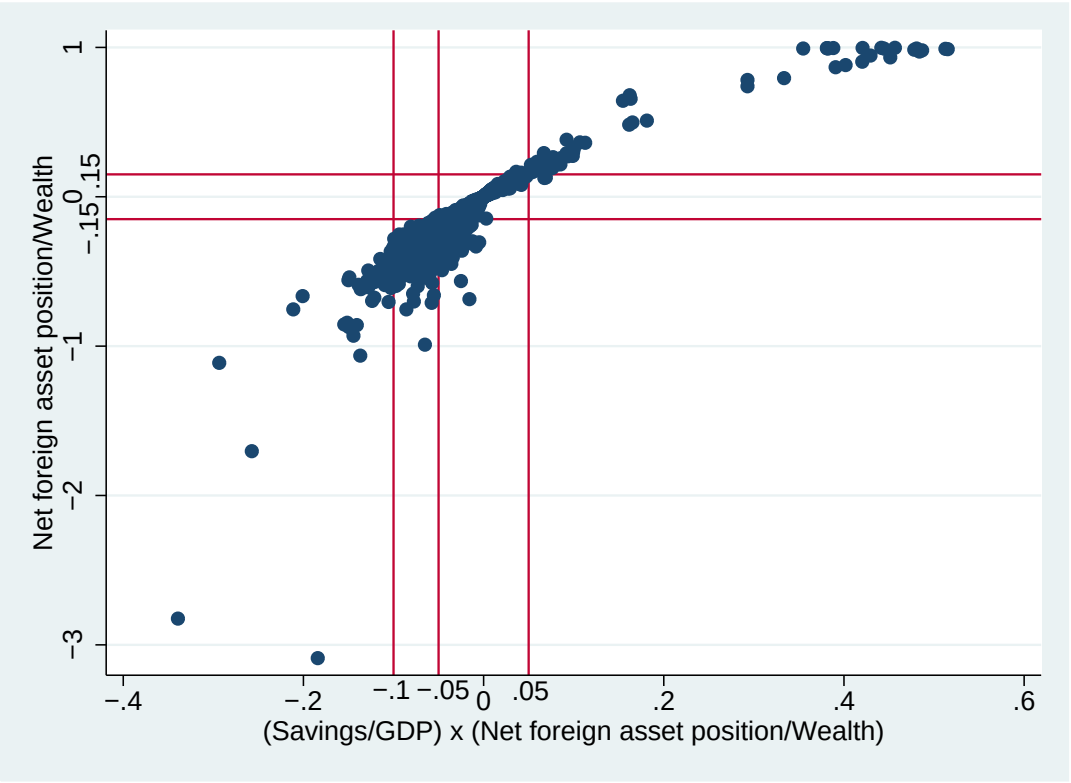

Figure 4: The new rule for "moderate" values of the net foreign asset position

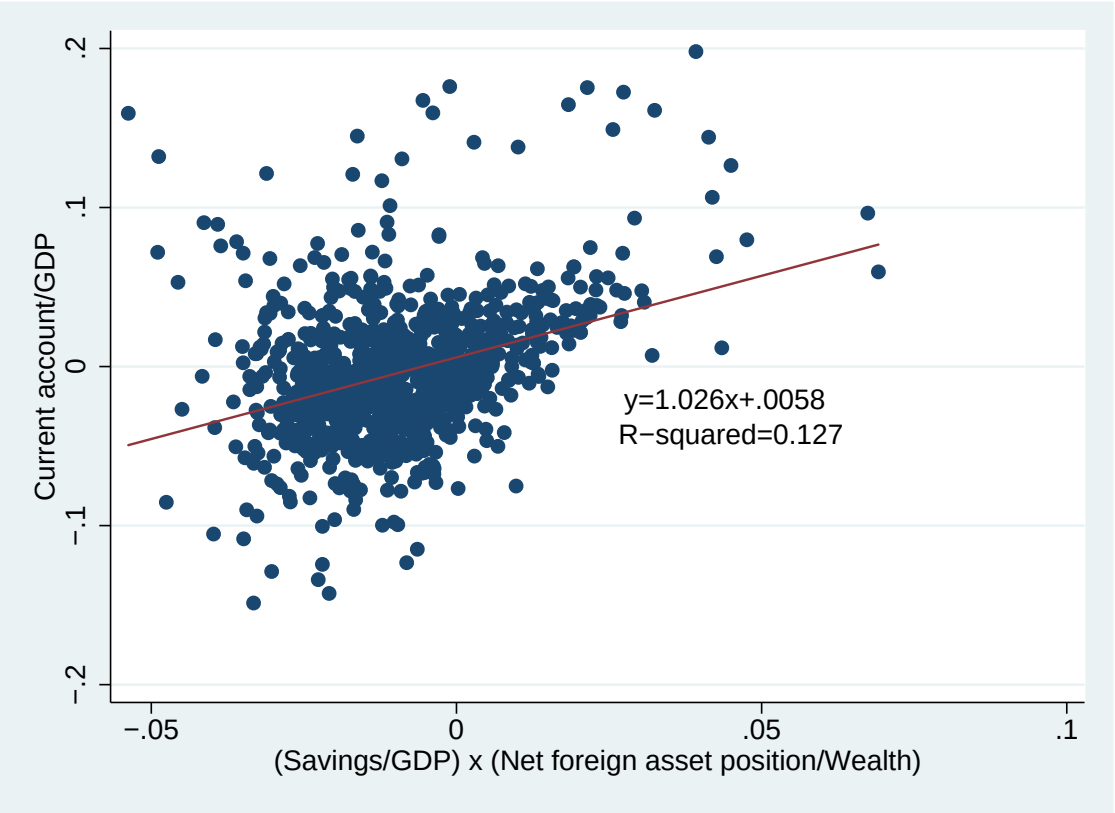

Figure 5: Net foreign asset positions (as a share of wealth vs. share of GDP)