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Do Common Currencies Facilitate the Net Flow of Capital Among Countries?

by

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Abstract

Earlier studies have hypothesized that membership in a common currency arrangement (either a currency union or a currency board) is associated with a lower correlation of participants' saving and investment rates, and a greater dispersion in their current account balances. This paper examines a panel of 128 countries over the period 1976-2005, and finds that common currencies loosen the correlation between national saving and investment, but only if the adopting country is in Europe, or has a relatively high per-capita income. I also find that the current account balances of common currency participants around the world are more highly correlated with fundamental factors than the current accounts of non-participants. Overall, the evidence does suggest that common currencies facilitate cross-country net capital flows and relax countries' current account constraints. Monetary integration facilitates the more efficient allocation of capital around the world.

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1. Introduction

In the last two decades, many countries around the world have chosen to abandon the independence of their national currencies and the ability to run a discretionary monetary policy. Some countries established currency board arrangements (CBAs) – Argentina between 1991 and 2001, Estonia in 1992, Lithuania in 1994, Bulgaria and Bosnia and Herzegovina in 1997. Others chose to dollarize unilaterally – Ecuador in 2000 and El Salvador in 2001. Still others – twelve member countries of the European Union – entered into a full-fledged monetary union. Slovenia became the thirteenth member of the Euro Area in early 2007; Cyprus and Malta are scheduled to join in 2008, and more EU member states are bound to follow in the near future. Several other currency unions are in the pipeline – for example, the six members of the Gulf Co-operation Council (GCC) in the Middle East are expected to have a common currency in place by 2010.[2] There has been sustained talk of an East Asian common currency, though that project appears to be slowly simmering on the backburner for now.

One major benefit of participating in a currency union or a currency board is that it is supposed to boost financial integration among participants. In particular, earlier studies have hypothesized that membership in a common currency arrangement is associated with a lower correlation of participants' saving and investment rates, and a greater dispersion in their current account balances. In other words, domestic investment in participating countries is relatively unconstrained by the stock of domestic saving. Furthermore, participants in currency blocs can sustain higher current account imbalances (both deficits and surpluses) compared to non-participants. In sum, common currencies facilitate the net flow of capital among countries.

The next section reviews the literature and discusses the theoretical arguments for why this is the case. Section 3 examines a panel of 128 countries over the period 1976-2005, and finds that common currencies loosen the correlation between national saving and investment, but only if the adopting country is in Europe, or has a relatively high per-capita income. I also find that the current account balances of common currency participants around the world are more sensitive to fundamental factors than the current accounts of non-participants. Overall, the evidence does suggest that common currencies facilitate cross-country net capital flows and unlock countries' current account constraints. Section 4 offers concluding remarks.

[2] The GCC member nations are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE).

2. Why should common currencies facilitate the net flow of capital among countries?

Blanchard and Giavazzi (2002) was perhaps the first paper to articulate the hypothesis that membership in the Euro Area leads to larger current account imbalances for participating countries. They argue that the European Monetary Union (EMU) has done so by reducing interest rate risk premia and by creating deeper and more liquid financial markets. The authors note that both Portugal and Greece have been able to sustain unusually large current deficits once they joined EMU. Blanchard and Giavazzi show that current account balances of EMU members have become more correlated to disparities in relative incomes. That is, high-income members of the club tend to have unusually large current account surpluses while low-income countries (Portugal and Greece included) tend to have surprisingly large deficits. On a related note, Blanchard and Giavazzi find that the correlation between national savings and investment rates might have fallen to zero in the Euro Area, and thus they proclaim "the end of the Feldstein-Horioka puzzle." All these developments are benign in their opinion; the greater dispersion of current account balances facilitates intertemporal trade and the optimal allocation of consumption and investment over time. Over time, EMU member countries will look more and more like the individual states in the US, which enjoy perfect inter-state capital mobility and do not even collect balance of payments data.

The Blanchard-Giavazzi hypothesis echoes an argument frequently made about the original Golden Age of financial globalization that took place during 1870-1913. Back then, private capital flowed quite freely from London to the emerging markets of the day. Britain was running sizable current account surpluses, while poorer countries on the periphery of the international financial system were running large deficits. The period 1870-1913 also happened to mark the heyday of the classical gold standard. Many economists have suggested that this is more than a coincidence, and that the gold standard in fact facilitated the net flow of capital among countries.

Interestingly, recent developments in the ten new EU member states from Central and Eastern Europe appear to match the Blanchard-Giavazzi hypothesis quite well. As Figure 1 illustrates, all ten countries are currently running current account deficits. However, the four countries with the largest such deficits, ranging from 11 to 21 percent of GDP, are Bulgaria, Estonia, Latvia and Lithuania. These are also the four countries that maintain either a currency board arrangement with the euro, or (as is the case in Latvia) an exchange rate regime that mimics the operation of a currency board. Once again, there appears to be a nexus between monetary and financial integration.

Arellano and Heathcote (2007) offer a theoretical model of the nexus between monetary integration ("dollarization") and financial integration. By dollarizing, a government "ties its hands:" it gives up the option of using seigniorage as a flexible fiscal instrument. That makes fiscal policy and the ability to issue debt all the more valuable. Given that default is punished by permanent exclusion from debt markets, the government's incentive to repay debt is strengthened. That in turn enhances its ability to borrow. Ultimately, dollarization relaxes a country's borrowing constraint and boosts financial integration.

While the current paper focuses on *net* capital flows (that is, on current account balances), several earlier papers have studied the impact of monetary integration on *gross* capital flows among countries. Spiegel (2004) uses a gravity-type model of bilateral bank lending to show that Portugal's entry into the EMU coincided with a switch in Portugal's borrowing patterns away from non-EMU sources and toward EMU ones. A similar effect is found for Greece as well. The author estimates that EMU membership triples cross-border bank lending among participants.

De Sousa and Lochard (2004) use a gravity model to analyze FDI flows and find that the EMU stimulates FDI flows within the Euro Area. They find no evidence of "FDI diversion" away from the non-EMU members of the pre-2004 European Union (Denmark, Sweden, and the United Kingdom). The authors argue that monetary integration boosts FDI flows because it eliminates exchange rate risk, reduces transaction costs, promotes price transparency, and boosts the credibility of macroeconomic policies.

The empirical approach in De Sousa and Lochard (2004) follows the one in Wei and Choi (2002), an earlier paper that also studied the impact of currency blocs on cross-border FDI flows in a gravity framework. Wei and Choi's data end in 1996 and they focus on the European Monetary System (EMS, a precursor to EMU) plus three more countries (Panama, Hong Kong and Argentina) that have participated in either a currency union or a currency board with the US dollar. According to their estimates, a country participating in a dollar bloc receives three times as much FDI from the US as an otherwise identical non-participant, even after controlling for the impact of reduced bilateral exchange rate volatility on FDI. Wei and Choi argue that currency blocs are an example of "institutional stabilization" while fixed exchange rates can achieve only "instrumental stabilization." That is why the former are so much more effective in boosting financial flows.

Table 1 summarizes 39 different episodes in which 37 different countries have participated in a common currency arrangement over the past three decades.[3] Thirty-two of the 37 countries participated in currency unions, while only 5 had currency board arrangements. There are 12 countries in the Euro Area, 3 currency boards in Central and Eastern Europe (Bulgaria, Estonia, Lithuania), 17 African countries (mostly former French colonies), and 5 countries in the Western Hemisphere (Argentina, Ecuador, El Salvador, Guatemala, Panama). Obviously then, those 37 countries are spread around the world and come in all sizes and at levels of development. According to Table 2, 18 of the 37 countries belonged to the upper half of the world income distribution in 2004. Furthermore, the episodes are reasonably spread out through time – see Figure 2.

Figures 3 thru 5 take a first look at whether participation in a common currency arrangement relaxes a country's current account balance. Figure 3 reports summary statistics on the current account balances of 128 countries around the world – see the Appendix for the country list. The figure reports the evolution over time of the cross-section mean absolute value of current account balances (expressed as a percentage of GDP). It also reports the cross-section standard deviation of current account balances. Both measures of dispersion have been steadily increasing in the past twenty years or so, indicating greater net flows of capital among countries and a greater degree of global financial integration.

Figure 4 looks at the mean absolute values of current account balances and distinguishes between participants and non-participants in common currency arrangements. According to the figure, common currency participants have had larger imbalances in their current accounts, indicating larger net cross-country flows of capital. However, the gap between participants and non-participants appears to be shrinking over time.

Figure 5 reports standard deviations of current account positions for both participants and non-participants in common currency areas. The story that emerges here is similar to that from Figure 4. With few exceptions, the standard deviation of the current account positions of participants in currency unions and currency boards has exceeded the standard deviation of non-participants' current accounts. However, once again that gap appears to have disappeared in recent years.

The evidence presented in Figures 3 and 4 is indicative but not definitive. First, the composition of the two groups of countries (participants and non-participants) has shifted over time, as illustrated in Figure 2. Second, the participant group might differ from the non-participant group

[3] Ireland and Luxembourg have each done so twice.

along other important dimensions, which might also influence the dynamics and dispersion of current account positions. Summary statistics can only take us that far. In Section 3, I refine the analysis by using Feldstein-Horioka regressions and an empirical model of medium-term current account dynamics similar to the one developed in Chinn and Prasad (2003) and Chinn and Ito (2005).

3. The empirical model

3.1. Model setup

One way to test the impact of common currency arrangements on capital mobility would be to estimate a modified version of the equation first proposed in Feldstein and Horioka (1980):

$$Investment_{i,t} = \beta_0 + \beta_1 Saving_{i,t} + \varepsilon_{i,t} \qquad \textbf{(1)}$$

Above, $Investment_{i,t}$ refers to gross capital formation (as a percentage of GDP) of country *i* during period *t*, while $Saving_{i,t}$ refers to gross domestic savings, again expressed as a percentage of GDP. The constant and the error term are denoted by β_0 and $\varepsilon_{i,t}$, respectively. Feldstein and Horioka argued that β_1 can be interpreted as a measure of capital mobility. It captures the extent to which domestic investment is financed by domestic savings at the margin. In a world with little or no capital mobility, β_1 will be very close to unity. Every extra dollar of domestic savings will lead to an extra dollar of domestic investment. In a world with perfect capital mobility, β_1 will be close to zero. An extra dollar of domestic savings is as likely to finance investment at home as it is to finance investment overseas.

Various later studies have disputed or qualified the Feldstein-Horioka interpretation of the β_1 coefficient. Obstfeld and Rogoff (1996) offer a concise summary of the most important critiques. For example, they point out that savings and investment rates are jointly endogenous. They are driven by common shocks, some of which might push them in the same direction and generate a positive statistical correlation between the two variables, regardless of the degree of capital mobility. Nevertheless, Feldstein-Horioka regressions have established themselves as a popular and intuitive way to test for the degree of capital mobility. As one example, historical studies of the evolution of capital mobility from 1870 till the present day have relied heavily on time-varying estimates of Feldstein-Horioka coefficients – see Bordeau and Flandreau (2001) and Taylor (2002), among many others.

To study the impact of currency unions and currency boards on international capital mobility, equation (1) above is augmented with the dummy variable $Common\_currency_{i,t}$, which is set to equal unity for each country *i* during each period *t* in which the country participated in a common currency arrangement. For example, the dummy equals one for Italy in 2005 and it equals zero for Italy in 1995. $Common\_currency_{i,t}$ enters equation (1) both by itself and in interaction with $Saving_{i,t}$ in order to measure the impact of common currencies both directly on the investment rate and, more importantly, on β_1, the sensitivity of domestic investment to changes in national savings.

A possible criticism of this empirical strategy is that the choice to enter a common currency arrangement is itself endogenous. In other words, the "treatment" of common currency participation is not assigned at random.[4] There might be omitted variables that affect both the decision to enter a common currency area and the dynamics of the savings-investment relationship in a given country. Economic size is one possible omitted variable. Perhaps smaller countries are more likely to enter a common currency area, and they are also more likely to have a lower correlation between national savings and investment.[5] Domestic inflation is another possible omitted variable. Perhaps countries adopt a currency union or a currency board in order to reduce their inflation rate, and perhaps it is really low domestic inflation that affects the Feldstein-Horioka coefficient (but how you achieve low inflation is irrelevant). In order to account for these possibilities, the Feldstein-Horioka equation is augmented with $Size_{i,t}$ and $Inflation_{i,t}$, both of which enter independently and in interaction with the gross domestic savings rate, in order to check how their presence affects both the intercept and the slope of the Feldstein-Horioka regression line. The regression equation estimated in this paper is as follows:

$$\begin{aligned} Investment_{i,t} = {} & \beta_0 + \beta_1 Saving_{i,t} + \beta_2 Size_{i,t} + \beta_3 Inflation_{i,t} + \\ & + \beta_4 (size_{i,t} * saving_{i,t}) + \beta_5 (inflation_{i,t} * saving_{i,t}) + \\ & + \beta_6 Common\_currency_{i,t} + \beta_7 (common\_currency_{i,t} * saving_{i,t}) + \varepsilon_{i,t} \end{aligned} \qquad \textbf{(2)}$$

$Size_{i,t}$ is the natural log of the share of country *i* in world GDP during period *t*, measured in constant year 2000 US dollars (not adjusted for PPP). $Inflation_{i,t}$ is the natural log of the gross rate of inflation, as measured by either the CPI or the GDP deflator. Both variables enter in natural logs in order to

[4] This point is made in Barry and Tenreyro (2007).
[5] Martin and Rey (2004) have pointed out that larger countries exhibit a larger "home bias" and larger savings retention coefficients.

reduce the influence of outliers.[6] Empirical estimates of equation (2) are expected to yield positive values for β_4 and β_5, and a negative value for β_7. Larger countries should have higher savings retention ratios, as should those with high inflation rates. Countries participating in a common currency arrangement should have a lower correlation between domestic savings and investment, signifying a higher degree of international capital mobility.

A second way to assess if participation in a common currency arrangement unlocks a country's current account constraint is to look at current account dynamics directly. Chinn and Prasad (2003) and Chinn and Ito (2005) offer an empirical model of the determinants of current account balances in the medium term. They estimate regression equations like this one:

$$Current\_account_{i,t} = \beta_0 + \beta_1 NFA_{i,t-1} + \beta_2 Relative\_income_{i,t} + \beta_3 Relative\_growth_{i,t} + \\ + \beta_4 Budget_{i,t} + \beta_5 Old\_dep\_ratio_{i,t} + \beta_6 Fuel\_exports_{i,t} + \varepsilon_{i,t} \quad \textbf{(3)}$$

$Current\_account_{i,t}$ denotes the current account balance, as a percentage of GDP, of country *i* in period *t*. $NFA_{i,t-1}$ denotes the net foreign assets (as a percentage of GDP) of country *i* in period *t-1*. Empirical estimates of β_1 are typically positive. Since net foreign assets are computed by cumulating past current account balances, a positive β_1 points to the persistence of a country's current account position over time.[7] $Relative\_income_{i,t}$ is country *i*'s per-capita GDP (adjusted for PPP) relative to the sample average in period *t*. In theory, capital should flow from high-income to low-income countries. Low-income countries tend to save less and they also offer better investment opportunities, since they are capital-hungry and offer a high marginal product of capital. This gives rise to current account deficits. The opposite is true of high-income countries. Thus, we expect to find $\beta_2 > 0$.

$Relative\_growth_{i,t}$ denotes country *i*'s GDP growth rate relative to the sample average in period *t*. In theory, capital should flow from slow-growing to fast-growing countries ($\beta_3 < 0$). Fast-growing countries typically save less and invest more, while the opposite holds for slow-growing ones. It is important to note that what matters is a country's GDP growth rate *relative* to the world average in a given period. Because the current accounts of all countries around the world must add up to zero in any given year, it is impossible for all countries to be running current account deficits at the

[6] For example, the economic size of the US and Japan dwarfs that of all other countries in the dataset.
[7] Including the current value of NFA would have been problematic since it would introduce a clearly endogenous variable on the righthand side of equation (3).

same time, no matter how fast they are growing. The *relatively* faster-growing countries will be running deficits, while the *relatively* slower-growing ones will be running surpluses.

$Budget_{i,t}$ denotes a country's budget balance as a percentage of its GDP. Empirical estimates of β_4 are typically positive but less than 1. An increase of one dollar in the budget deficit typically leads to a smaller increase in a country's current account deficit. This could be due to two factors. First, changes in public savings might induce changes in private saving behavior, due to the "Ricardian equivalence" channel. If the government decides to save less, the private sector might decide to save more, and therefore the reduction in national savings might be less than one dollar. Second, an increase in the budget deficit might push up the equilibrium real interest rate and crowd out domestic investment. Of course, this mechanism is at work only for countries that are large enough to be able to influence the equilibrium world real interest rate, or for countries that are shut off from international financial markets.

$Old\_dep\_ratio_{i,t}$ denotes the share of people in country *i* aged 65 or above, relative to the sample average for period *t*. According to standard lifecycle theory, the higher the old-age dependency ratio, the lower a country's national saving rate and its current account balance. Thus, β_5 is expected to turn out negative. Once again, it is important to note that what matters is a country's demographic profile *relative* to the world average in a given period. Even if all countries in the world have ageing populations, they cannot all run current account deficits simultaneously. The *relatively* older countries will be running deficits, while the *relatively* younger ones will be running surpluses.

Finally, $Fuel\_exports_{i,t}$ denotes the share of merchandise exports of country *i* accounted for by fuel exports. Both Chinn and Prasad (2003) and Chinn and Ito (2005) have a dummy for oil-exporting countries. The coefficient on that dummy typically turns out to be positive.

My hypothesis is that participants in common currency arrangements have different β's: both a different intercept and different slope parameters. Therefore, equation (3) is augmented with the dummy variable $Common\_currency_{i,t}$, by itself and in interaction with all the righthand-side variables. The regression equation estimated in this paper is as follows:

$$Current\_account_{i,t} = \beta_0 + \beta_1 Common\_currency_{i,t} +$$
$$+ \beta_2 NFA_{i,t-1} + \beta_3 (NFA_{i,t-1} * common\_currency_{i,t}) +$$
$$+ \beta_4 Relative\_income_{i,t} + \beta_5 (relative\_income_{i,t} * common\_currency_{i,t}) +$$
$$+ \beta_6 Relative\_growth_{i,t} + \beta_7 (relative\_growth_{i,t} * common\_currency_{i,t}) +$$
$$+ \beta_8 Budget_{i,t} + \beta_9 (budget_{i,t} * common\_currency_{i,t}) +$$
$$+ \beta_{10} Old\_dep\_ratio_{i,t} + \beta_{11} (old\_dep\_ratio_{i,t} * common\_currency_{i,t}) +$$
$$+ \beta_{12} Fuel\_exports_{i,t} + \beta_{13} (fuel\_exports_{i,t} * common\_currency_{i,t}) +$$
$$+ \varepsilon_{i,t} \qquad \textbf{(4)}$$

If indeed being a member of a currency union or a currency board unlocks a country's current account, then we would expect the current account to become more sensitive to the fundamental determinants listed above. For example, if a country belongs to a common currency arrangement, we would expect there to be a tighter relationship between its current account position and its relative per-capita income. A high-income country should have a higher current account surplus *if* it belongs to a currency union or currency board than would otherwise be the case. And vice versa, a common currency should allow a low-income country to run a higher-than-usual current account deficit. In other words, we would expect to find that $\beta_5 > 0$. By a similar train of logic, we expect to find the following:

$\beta_5, \beta_9, \beta_{13} > 0$

$\beta_7, \beta_{11} < 0$

To illustrate the logic here, suppose that we have two countries A and B, which are identical in every respect. In particular, both countries have *identical* high per-capita incomes, high budget surpluses, high percentages of fuel exports, *low* rates of GDP growth, and *low* old-age dependency ratios. The only difference is that country A belongs to a common currency arrangement while country B does not. Then we would expect both countries to run current account surpluses. However, country A's surplus would be larger.

3.2. Preliminary data analysis

Equations (2) and (4) will be estimated using a panel of 128 countries over the period 1976-2005. The list of participating countries is given in the Appendix. This includes all 30 members of the

Organization for Economic Cooperation and Development (OECD) and all 27 members of the European Union (the two groups overlap, of course). 128 countries turned out to be the maximum possible number of countries that could have been included. They come in all sizes, from all continents, and at all levels of development (see Table 2).

In constructing a panel dataset, there is always a difficult trade-off between maximizing the number of degrees of freedom and preserving the homogeneity of data. One might argue that 128 countries amount to a rather heterogeneous panel. The results from this paper might then be interpreted as describing the hypothetical "average country." Furthermore, in Sections 3.3 and 3.4 I focus on more homogenous sub-samples of countries. For example, I estimate equations (2) and (4) only for the 30 members of the OECD, or only for the 27 members of the EU.

The time frequency of the underlying data is annual. However, in estimating both equation (2) and equation (4) I use non-overlapping 5-year arithmetic means of the corresponding annual variables.[8] This is done in order to filter out short-term fluctuations in the data, so that we can focus on the medium term. There are three exceptions. $Inflation_{i,t}$ and $Relative\_growth_{i,t}$ refer to the 5-year *geometric* means of the corresponding annual variables. $NFA_{i,t-1}$ refers to net foreign assets during the year preceding the beginning of the current 5-year period. For example, if the current period is 2001-2005, then $NFA_{i,t-1}$ refers to net foreign assets in 2000.

The data source for most of the variables is the World Bank's database World Development Indicators (WDI). For $Budget_{i,t}$ data from the WDI was supplemented by data from the International Monetary Fund's database International Financial Statistics. For $NFA_{i,t}$, I used the data compiled in Milesi-Ferretti and Lane (2006).

Table 1 summarizes the 39 different episodes in which 37 different countries have participated in a common currency arrangement over the past three decades. Since I am working with non-overlapping 5-year periods, the $Common\_currency_{i,t}$ dummy variable is set to 1 only if country *t* belonged to a common currency area for at least 4 out of the 5 years in the period.

Due to missing values, the typical actual sample size is 482 data points for the Feldstein-Horioka regressions and 693 data points for the Chinn-Prasad-Ito regressions, or respectively 63% and 90% of the theoretical maximum of 768 data points (128 countries * 6 non-overlapping 5-year periods between 1976 and 2005). The data constitute an unbalanced panel, and is estimated by OLS with time-fixed effects. Following Chinn and Prasad (2003) and Gruber and Kamin (2005), I did not

[8] Due to missing data for some periods and countries, some of the averages are based on fewer than 5 data points.

include country-specific fixed effects. Those papers argue that allowing for country-specific intercepts would distract from understanding the cross-country variation in investment rates and current accounts.

3.3. Results from Feldstein-Horioka regressions

Table 3 reports results from estimating the Feldstein-Horioka equation (2).[9] Column (1) in that table reports estimates without the *Common_currency* dummy variable. The fit of the model is reasonable, with an R^2 of 0.36. The Feldstein-Horioka coefficient (β_1) is estimated at 0.42 and is highly statistically significant. It turns out that neither economic size nor the inflation rate has any significant impact on the Feldstein-Horioka coefficient in this specification.

Column (2) includes the *Common_currency* dummy variable. It turns out for the full sample that participation in a common currency area does not affect the savings retention coefficient one way or the other. In other words, we find no evidence, at least for the overall sample of 128 countries, that monetary integration leads to greater or lower capital mobility.

A possible criticism of the full sample might be that it is too heterogeneous. A more nuanced picture emerges if we look at different subsets of common currency arrangements around the world. Column (3) in Table 3 restricts the sample to the 64 high-income countries in the dataset, based on PPP-adjusted GDP per capita for the year 2004 (see Table 2). Of those 64 countries in the upper half of the world income distribution, 18 have participated in a currency union or a currency board. For this sub-sample, it turns out that the countries belonging to a common currency area indeed have a lower savings retention coefficient. The coefficient on (*common_currency * saving*) is negative and large (-0.28), and it is highly statistically significant. Combining it with the 0.44 savings retention coefficient suggests that common currency participants have a savings retention coefficient of around zero! Indeed, a Wald test reveals that the sum of the two coefficients is not statistically different from zero. In other words, for these countries domestic investment is completely unconstrained by domestic saving. Note that this is the case even after allowing for the possibility that it is really smallness (in economic terms) or low inflation that reduces the Feldstein-Horioka coefficient. We find no support for either of these hypotheses in column (3) – the coefficients on both (*size * saving*) and (*inflation * saving*) are insignificant.

[9] All regressions reported in this paper were estimated using Stata 8.0.

Column (4) looks at the full sample of 128 countries again, and explores whether common currency arrangements work differently on different continents. I look at common currencies in Africa (17 countries), in the Western Hemisphere (5 countries), and in Europe (15 countries). Judging by the results, there is evidence that common currency arrangements reduce the Feldstein-Horioka coefficient in Europe only. The coefficient estimate (-0.37) is close to the one estimated in column (3). Once again, we cannot reject the null hypothesis that common currency participants in Europe face a Feldstein-Horioka coefficient of zero. This time, we find evidence that larger countries tend to have larger Feldstein-Horioka coefficients – the coefficient on (*size * saving*) is positive and significant. But the rate of inflation does not play a role.

The results in columns (3) and (4) suggest that common currency arrangements in high-income European countries are special. Therefore, columns (5) thru (7) focus on the European Monetary Union. I split the *Common_currency* dummy into two dummy variables: *EMU* and *Non_EMU_common_currency*. *Non_EMU_common_currency* covers all common currency arrangements outside of the EMU. Thus, the *EMU* dummy equals 1 for Germany in 2005 and it equals 0 for Germany in 1995. The *Non_EMU_common_currency* dummy equals 1 for Argentina in 1995 and it equals 0 for Argentina in 2005. For the full sample, each dummy variable covers 12 and 26 countries, respectively.[10]

Column (5) reports results from the full sample of 128 countries. Column (6) reports results from a sample restricted to the 30 members of the OECD. All 12 EMU countries are also members of the OECD. The only non-EMU common currency participant is pre-1999 Luxemburg. Column (7) reports results from a sample restricted to the 27 current members of the European Union, where the only non-EMU common currency participants are pre-1999 Luxemburg together with Bulgaria, Estonia, and Lithuania.

The results in columns (5)-(7) are consistent with those in columns (3)-(4). The coefficients on (*EMU * saving*) are around -0.40 and are always statistically significant. Wald tests cannot reject the null hypothesis that EMU members face a Feldstein-Horioka coefficient of zero. In column (7), the same holds for the non-EMU common currency participants, a group dominated by Bulgaria, Estonia, and Lithuania. In columns (5)-(7) we find almost no evidence that economic size or inflation matters for savings retention coefficients

[10] Luxembourg enters both groups, both as a current member of the EMU, and with its pre-EMU currency union with Belgium. Slovenia entered EMU in early 2007, while my sample ends in 2005.

To sum up, according to Feldstein-Horioka regressions, the hypothesis that monetary integration leads to greater current account imbalances appears to hold only for those participants in a common currency arrangement that are in Europe, or have relatively high per-capita incomes. This is consistent with results reported in Bordo and Flandreau (2001) for a data sample ending in 1996. They found that "hard pegs" (such as currency boards) as well as the European Exchange Rate Mechanism (ERM) have tended to be associated with lower Feldstein-Horioka coefficients. Based on this, Bordo and Flandreau describe the nexus between financial globalization and monetary integration as "Eurocentric", in the sense that Western Europe offers the strongest supporting evidence.

Overall, in Table 3 we found some weak evidence for the size effect discussed in Martin and Rey (2004). Larger countries do appear to have larger savings retention coefficients and to exhibit a larger degree of "home bias." Of the 7 estimates of β_4, 6 are positive and 3 are statistically significant. On the other hand, we found no evidence that a country's inflation rate has any effect on its Feldstein-Horioka coefficient. None of the 7 estimates of β_5 in Table 3 is statistically significant.

3.4. Results from Chinn-Prasad-Ito regressions

Table 4 reports results from estimating equation (4). Column (1) in the table reports estimates from the full sample, without the *Common_currency* dummy variable. The fit of the model is good, with an R^2 of 0.42. All regression coefficients have the expected signs, and all except *Relative_growth* are statistically significant at the 5% level or better. Current account balances are persistent, as shown by the coefficient on the *NFA* variable. Countries with relatively high per-capita incomes, budget surpluses, and fuel exports tend to have current account surpluses, while countries with relatively high old-age dependency ratios tend to have current account deficits.

Column (2) includes the *Common_currency* dummy variable. As predicted, participation in a common currency arrangement increases the correlation of current account balances with their determinants. Among common currency participants, current accounts are more sensitive to disparities in relative incomes.[11] The current accounts of common currency participants are also more highly correlated with disparities in relative GDP growth rates and in demographic structures. All of these are statistically significant, at the 10% level or better. Finally, budget balances are also more

[11] This is mostly due a higher sensitivity of national saving to relative income. Regression results with national saving as the dependent variable are not reported here but are available from the author upon request.

correlated with current account balances, although this effect is marginally statistically significant (with a *p*-value of 0.117). *Fuel_exports* is the only variable for which there does not seem to be a difference between common currency participants and non-participants, as far as current account dynamics are concerned.[12]

Given that the results from the Feldstein-Horioka regressions (reported in Table 3) singled out the EMU member states, columns (3) and (4) report results from Chinn-Prasad-Ito regressions for sub-samples restricted to the 30 members of the OECD and the 27 members of the EU. As discussed previously, in both sub-samples the group of common currency participants is dominated heavily by members of the EMU. The results in columns (3)-(4) are consistent with those in column (2). Participation in a common currency arrangement increases the correlation of current account balances with disparities in relative GDP growth rates. Among common currency participants in the OECD and the EU, capital definitely appears to flow from slow-growing to fast-growing countries. The current accounts of common currency participants are more sensitive to the share of fuel exports in their trade as well. The evidence on disparities in relative per-capita incomes and in budget balances is a bit weaker: the current accounts of common currency participants are more sensitive to disparities in relative incomes only in the OECD sample, and they are more sensitive to disparities in budget balances only in the EU sample. Finally, in both samples, current accounts of common currency members do not appear to be more sensitive to demographic differences, compared to non-participants.

4. Concluding remarks

Earlier studies have hypothesized that membership in a common currency arrangement (either a currency union or a currency board) is associated with a lower correlation of participants' saving and investment rates, and a greater dispersion in their current account balances. This paper examines a panel of 128 countries over the period 1976-2005, and finds that common currencies loosen the correlation between national saving and investment, but only if the adopting country is in Europe or has a relatively high per-capita income. I also find that the current account balances of common currency participants around the world are more sensitive to fundamental factors than the current accounts of non-participants. Overall, the evidence does suggest that common currencies unlock

[12] However, the national saving of common currency participants is more sensitive to fuel exports. Again, this result is not reported here but is available upon request.

countries’ current account constraints and facilitate cross-country net capital flows. Monetary integration facilitates the more efficient allocation of capital around the world.

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APPENDIX: LIST OF THE 128 COUNTRIES COVERED IN THE DATASET

1. Albania
2. Algeria
3. Argentina
4. Armenia
5. Australia
6. Austria
7. Azerbaijan
8. Bahrain
9. Bangladesh
10. Belarus
11. Belgium
12. Benin
13. Bolivia
14. Botswana
15. Brazil
16. Bulgaria
17. Burkina Faso
18. Cambodia
19. Cameroon
20. Canada
21. Chad
22. Chile
23. China
24. Colombia
25. Republic of Congo
26. Costa Rica
27. Côte d'Ivoire
28. Croatia
29. Cyprus
30. Czech Republic
31. Denmark
32. Dominican Republic
33. Ecuador
34. Egypt
35. El Salvador
36. Estonia
37. Ethiopia
38. Fiji
39. Finland
40. France
41. Gabon
42. Georgia
43. Germany
44. Ghana
45. Greece
46. Guatemala
47. Guinea
48. Haiti
49. Honduras
50. Hungary
51. Iceland
52. India
53. Indonesia
54. Iran
55. Ireland
56. Israel
57. Italy
58. Jamaica
59. Japan
60. Jordan
61. Kazakhstan
62. Kenya
63. Korea
64. Kyrgyzstan
65. Latvia
66. Lebanon
67. Lithuania
68. Luxembourg
69. Macedonia
70. Madagascar
71. Malawi
72. Malaysia
73. Mali
74. Malta
75. Mauritius
76. Mexico
77. Moldova
78. Morocco
79. Namibia
80. Nepal
81. Netherlands
82. New Zealand
83. Nicaragua
84. Niger
85. Nigeria
86. Norway
87. Oman
88. Pakistan
89. Panama
90. Papua New Guinea
91. Paraguay
92. Peru
93. Philippines
94. Poland
95. Portugal
96. Romania
97. Russia
98. Rwanda
99. Saudi Arabia
100. Senegal
101. Singapore
102. Slovakia
103. Slovenia
104. South Africa
105. Spain
106. Sri Lanka
107. Sudan
108. Swaziland
109. Sweden
110. Switzerland
111. Syria
112. Tajikistan
113. Tanzania
114. Thailand
115. Togo
116. Trinidad and Tobago
117. Tunisia
118. Turkey
119. Uganda
120. Ukraine
121. United Kingdom
122. United States
123. Uruguay
124. Venezuela
125. Vietnam
126. Yemen
127. Zambia
128. Zimbabwe

Table 1: List of currency unions and currency boards around the world (in existence in or after 1976)

Country	Description of arrangement	Start	End
Argentina	Currency board with USD	1992	2001
Austria	Currency union (Euro Area)	1999	present
Belgium	Currency union (Euro Area)	1999	present
Benin	Currency union; CFA / Central Bank of West African States / WAEMU	1976 or earlier	present
Bulgaria	Currency board with DEM, later EUR	1998	present
Burkina Faso	Currency union; CFA / Central Bank of West African States / WAEMU	1976 or earlier	present
Cameroon	Currency union; CFA / Bank of Central African States / CAEMC	1976 or earlier	present
Chad	Currency union; CFA / Bank of Central African States / CAEMC	1976 or earlier	present
Congo, Republic of	Currency union; CFA / Bank of Central African States / CAEMC	1976 or earlier	present
Cote D'Ivoire	Currency union; CFA / Central Bank of West African States / WAEMU	1976 or earlier	present
Ecuador	Currency union with USD	2001	present
El Salvador	Currency union with USD	2001	present
Estonia	Currency board with DEM, later EUR	1993	present
Finland	Currency union (Euro Area)	1999	present
France	Currency union (Euro Area)	1999	present
Gabon	Currency union; CFA / Bank of Central African States / CAEMC	1976 or earlier	present
Germany	Currency union (Euro Area)	1999	present
Greece	Currency union (Euro Area)	2001	present
Guatemala	Currency union with USD	1976 or earlier	1985
Ireland	Currency union with GBP	1931	1978
Ireland	Currency union (Euro Area)	1999	present
Italy	Currency union (Euro Area)	1999	present
Kenya	Currency union; East African Currency Area	1976 or earlier	1978
Lithuania	Currency board with USD and EUR (switch in 2002)	1995	present
Luxembourg	Currency union with Belgian franc	1944	1998
Luxembourg	Currency union (Euro Area)	1999	present
Madagascar	Currency union with FFR	1976 or earlier	1981
Mali	Currency union; CFA / Central Bank of West African States / WAEMU	1985	present
Namibia	Currency union with South African Pound/Rand	1920	present
Netherlands	Currency union (Euro Area)	1999	present
Niger	Currency union; CFA / Central Bank of West African States / WAEMU	1976 or earlier	present
Panama	Currency union with USD	1904	present
Portugal	Currency union (Euro Area)	1999	present
Senegal	Currency union; CFA / Central Bank of West African States / WAEMU	1976 or earlier	present
Spain	Currency union (Euro Area)	1999	present
Swaziland	Currency union, then currency board with South African Pound/Rand	1921	present
Tanzania	Currency union; East African Currency Area	1976 or earlier	1978
Togo	Currency union; CFA / Central Bank of West African States / WAEMU	1976 or earlier	present
Uganda	Currency union; East African Currency Area	1976 or earlier	1978

Notes: This table identifies only those participants in a common currency arrangement which already belong to the 128 countries covered in my dataset (see the country list in the Appendix). A more extensive list of participants in common currency arrangements is available from the author upon request.

Sources: Ghosh, Gulde, and Wolf (2000), Glick and Rose (2002), Frankel and Rose (2002), IMF (2006), Reinhart and Rogoff (2002), Rose and Engel (2002), Schuler (1992), CIA's The World Factbook, IMF's International Financial Statistics, Wikipedia, www.dollarization.org.

Table 2: A ranking of the 128 countries in the dataset by GDP per capita (PPP, 2004)

Country	GDP per capita
Luxembourg	**$51,892**
United States	$36,451
Norway	$36,282
Ireland	**$33,194**
Switzerland	$31,310
Iceland	$31,269
Austria	**$29,662**
Denmark	$29,409
United Kingdom	$29,231
Canada	$29,136
Netherlands	**$28,819**
Belgium	**$28,379**
Sweden	$28,276
Finland	**$28,116**
Australia	$27,840
Japan	$27,114
France	**$26,871**
Germany	**$25,945**
Italy	**$25,579**
Singapore	$25,401
Spain	**$23,757**
Israel	$22,265
New Zealand	$22,025
Cyprus	$20,194
Greece	**$20,143**
Slovenia	$19,081
Korea	$18,934
Portugal	**$18,172**
Bahrain	$18,148
Czech Republic	$17,270
Malta	$16,748
Hungary	$15,254
Oman	$13,881
Saudi Arabia	$13,459
Slovakia	$13,329
Estonia	**$12,516**
Trinidad and Tobago	$12,181
Lithuania	**$11,924**
Poland	$11,913
Argentina	**$11,750**
Croatia	$11,127
Latvia	$10,953
Mauritius	$10,904
Botswana	$10,354
Chile	$10,168
South Africa	$9,533
Mexico	$9,385
Malaysia	$9,374
Russia	$9,021
Costa Rica	$8,697
Uruguay	$8,374
Romania	$7,725
Bulgaria	**$7,577**
Thailand	$7,453
Brazil	$7,406
Tunisia	$7,215
Turkey	$7,055
Iran	$6,887
Dominican Republic	$6,786
Namibia	**$6,592**
Panama	**$6,473**
Kazakhstan	$6,428
Belarus	$6,416
Colombia	$6,275

Country	GDP per capita
Macedonia	$6,172
Gabon	**$6,149**
Algeria	$6,058
Ukraine	$5,893
China	$5,490
Venezuela	$5,490
Fiji	$5,388
Peru	$5,122
Lebanon	$4,970
Jordan	$4,692
El Salvador	**$4,629**
Albania	$4,508
Philippines	$4,431
Swaziland	**$4,258**
Paraguay	$4,106
Guatemala	**$4,034**
Morocco	$4,030
Sri Lanka	$3,914
Armenia	$3,847
Jamaica	$3,768
Egypt	$3,747
Ecuador	**$3,740**
Azerbaijan	$3,571
Syria	$3,304
Indonesia	$3,282
Nicaragua	$3,208
Honduras	$2,998
India	$2,851
Georgia	$2,713
Vietnam	$2,549
Bolivia	$2,456
Papua New Guinea	$2,251
Cambodia	$2,182
Ghana	$2,126
Cameroon	**$2,039**
Guinea	$2,037
Pakistan	$2,004
Zimbabwe	$1,950
Bangladesh	$1,756
Sudan	$1,750
Kyrgyzstan	$1,742
Moldova	$1,739
Senegal	**$1,553**
Haiti	$1,471
Cote d'Ivoire	**$1,462**
Nepal	$1,370
Togo	**$1,337**
Uganda	**$1,257**
Chad	**$1,241**
Tajikistan	$1,136
Kenya	**$1,067**
Burkina Faso	**$1,063**
Republic of Congo	**$1,059**
Rwanda	$1,030
Benin	**$1,008**
Nigeria	$959
Mali	**$892**
Zambia	$879
Ethiopia	$879
Yemen	$833
Madagascar	**$807**
Niger	**$687**
Tanzania	**$631**
Malawi	$591

Note: Highlighted countries participated in a common currency at some point in or after 1976.
Source: The World Bank's World Development Indicators.

Table 3: The impact of common currencies on the Feldstein-Horioka coefficient (panel regressions, OLS with time-fixed effects)

Dependent variable: Investment	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Full	Full	High-income countries	Full	Full	OECD	EU-27
Independent variables							
Constant	13.08***	12.99***	11.61***	12.24***	12.65***	11.10***	16.71***
	(2.036)	(1.929)	(1.947)	(1.949)	(1.931)	(2.649)	(2.184)
Saving	0.42***	0.43***	0.44***	0.46***	0.44***	0.48***	0.22*
	(0.086)	(0.083)	(0.085)	(0.082)	(0.082)	(0.122)	(0.114)
Size	-0.90**	-1.19***	-1.14*	-1.37***	-1.29***	-1.96*	-0.57
	(0.445)	(0.446)	(0.582)	(0.458)	(0.448)	(1.100)	(0.850)
Inflation	0.68	0.07	0.67	-0.03	0.04	-1.12	-10.73*
	(1.016)	(0.996)	(1.312)	(1.006)	(1.002)	(6.204)	(6.037)
(size * saving)	0.03	0.04*	0.03	0.05**	0.04**	0.07	-0.04
	(0.021)	(0.021)	(0.026)	(0.021)	(0.021)	(0.049)	(0.043)
(inflation * saving)	-0.04	-0.03	-0.04	-0.03	-0.03	0.17	0.39
	(0.062)	(0.059)	(0.060)	(0.059)	(0.059)	(0.252)	(0.253)
Common_currency		-3.13*	4.67*				
		(1.770)	(2.394)				
(common_currency * saving)		0.05	-0.28***				
		(0.082)	(0.086)				
Common_currency_Africa				-4.04**			
				(1.892)			
Common_currency_Western_Hemisphere				-2.79			
				(2.389)			
Common_currency_Europe				7.83***			
				(2.095)			
(common_currency_Africa * saving)				0.12			
				(0.080)			
(common_currency_Western_Hemisphere * saving)				-0.02			
				(0.091)			
(common_currency_Europe * saving)				-0.37***			
				(0.068)			
Non_EMU_common_currency					-3.53**	-15.54**	5.31
					(1.788)	(5.721)	(3.485)
EMU					7.88***	8.34**	9.29***
					(2.377)	(3.622)	(3.108)
(Non_EMU_common_currency * saving)					0.07	0.27	-0.38***
					(0.083)	(0.232)	(0.107)
(EMU * saving)					-0.39***	-0.38**	-0.41***
					(0.085)	(0.168)	(0.135)
Number of observations	693	693	352	693	693	173	143
R^2	0.36	0.37	0.42	0.39	0.38	0.51	0.51

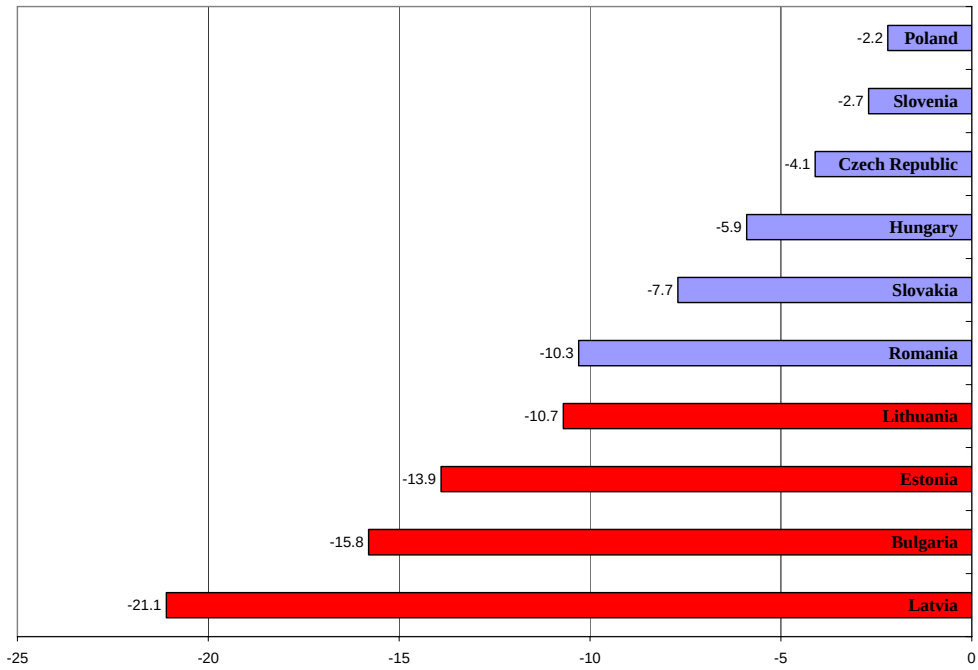
Notes: All regressions estimate equation (2) in the main text of the paper. All regressions report standard errors which are heteroscedasticity-consistent, as well as robust to clustering. Standard errors are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% level, respectively. All regressions include time-fixed effects (coefficients not reported).

Table 4: The impact of common currencies on current account dynamics (panel regressions, OLS with time-fixed effects)

Dependent variable: Current_account	(1)	(2)	(3)	(4)
Sample	**Full**	**Full**	**OECD**	**EU-27**
Independent variables				
Constant	**11.48**	**7.23**	**-25.16***	**2.83**
	(8.45)	*(9.01)*	*(14.01)*	*(26.48)*
Common_currency		**59.23****	**139.64*****	**98.47***
		(28.05)	*(46.41)*	*(52.61)*
NFA	**0.04*****	**0.04*****	**0.06*****	**0.01**
	(0.01)	*(0.01)*	*(0.01)*	*(0.02)*
(NFA * common_currency)		**-0.02**	**-0.09*****	**-0.03**
		(0.02)	*(0.02)*	*(0.02)*
Relative_income	**1.60*****	**1.16****	**0.92**	**2.94*****
	(0.52)	*(0.56)*	*(0.82)*	*(0.85)*
(relative_income * common_currency)		**2.15***	**5.93****	**1.97**
		(1.24)	*(2.50)*	*(1.39)*
Relative_growth	**-11.03**	**-6.70**	**23.73***	**-8.78**
	(8.37)	*(8.86)*	*(13.86)*	*(26.56)*
(relative_growth * common_currency)		**-59.65****	**-164.71*****	**-114.33****
		(28.02)	*(41.15)*	*(47.89)*
Budget	**0.32*****	**0.32*****	**0.02**	**0.27**
	(0.07)	*(0.07)*	*(0.07)*	*(0.20)*
(budget * common_currency)		**0.54°**	**0.52**	**0.69****
		(0.34)	*(0.78)*	*(0.29)*
Old_dep_ratio	**-1.49****	**-0.89**	**-0.19**	**-1.19**
	(0.74)	*(0.80)*	*(0.91)*	*(1.46)*
(old_dep_ratio * common_currency)		**-3.35****	**1.70**	**4.00**
		(1.51)	*(3.55)*	*(2.94)*
Fuel_exports	**0.04*****	**0.04*****	**0.06****	**0.11**
	(0.01)	*(0.01)*	*(0.03)*	*(0.06)*
(fuel_exports * common_currency)		**-0.01**	**0.62***	**0.30****
		(0.05)	*(0.36)*	*(0.11)*
Number of observations	**482**	**482**	**138**	**104**
R^2	**0.42**	**0.45**	**0.50**	**0.57**

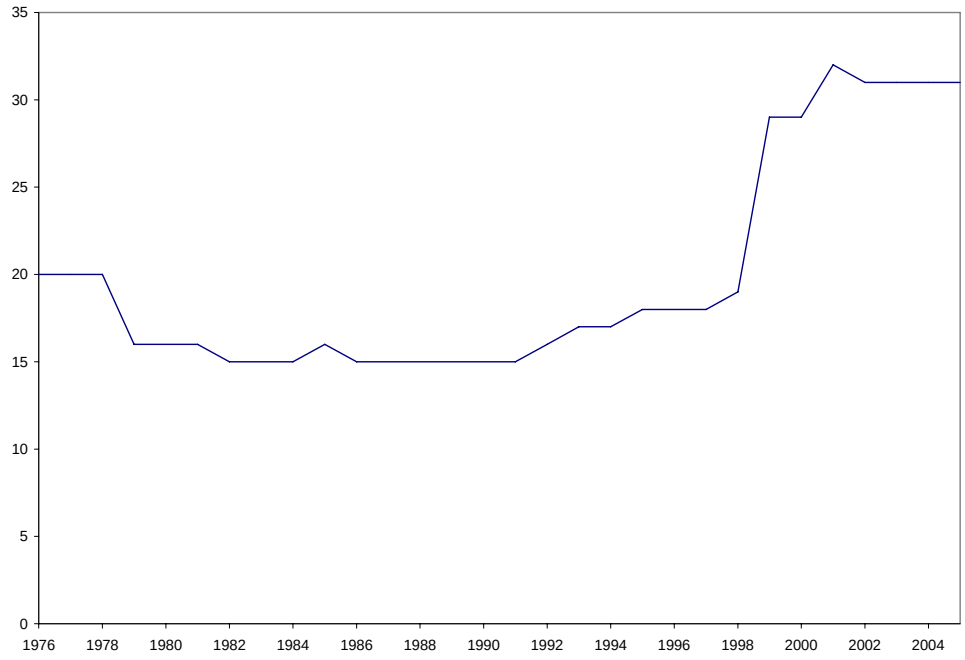
Notes: All regressions estimate equation (4) in the main text of the paper. All regressions report standard errors which are heteroscedasticity-consistent, as well as robust to clustering. Standard errors are reported in parentheses. ***, **, *, ° denote statistical significance at the 1%, 5%, 10%, 12% level, respectively. All regressions include time-fixed effects (coefficients not reported).

Figure 1: Current account balances in Central and Eastern Europe (2006, % of GDP)



Source: European Commission

Figure 2: Total number of countries participating in a common currency area (1976 – 2005)

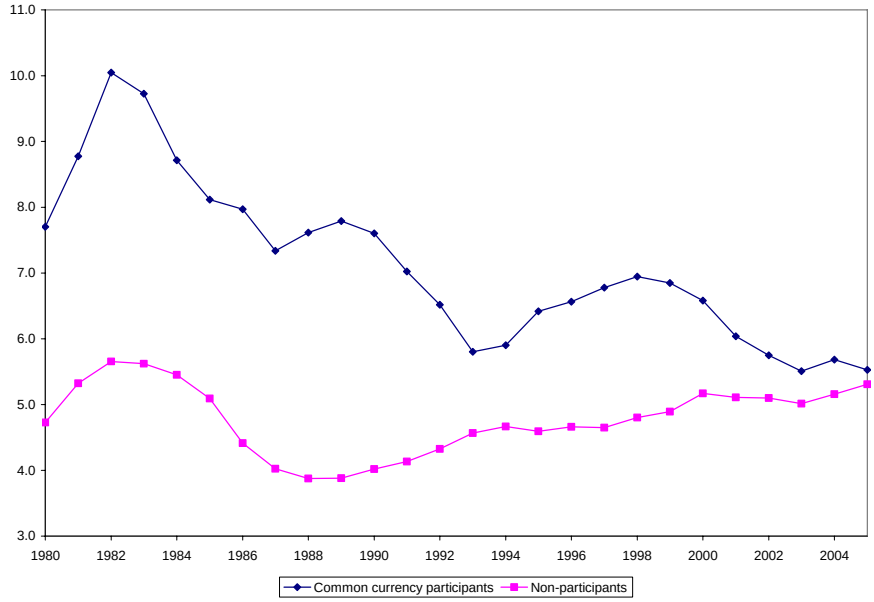


Source: Table 1

Figure 3: Summary statistics on current account balances for a cross-section of 128 countries (% of GDP, 5-year rolling averages)

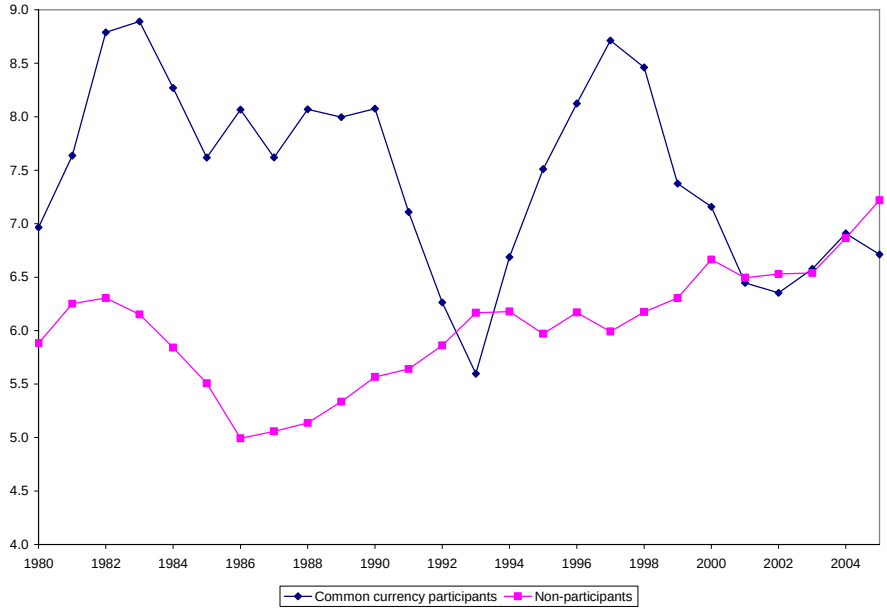
Note: See Appendix and Table 1.
Source: The World Bank's World Development Indicators

Figure 4: Cross-country mean absolute values of current account balances: common currency participants versus non-participants (% of GDP, 5-year rolling averages)



Note: See Appendix and Table 1.
Source: The World Bank's World Development Indicators

Figure 5: Cross-country standard deviations of current account balances: common currency participants versus non-participants (% of GDP, 5-year rolling averages)



Note: See Appendix and Table 1.
Source: The World Bank's World Development Indicators