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Current Account Deficits in the Euro Area: The End of the Feldstein-Horioka Puzzle?

In 2000–01 the current account deficit of Portugal reached 10 percent of its GDP, up from 2–3 percent at the start of the 1990s. These deficits are forecast to continue in the 8–9 percent range for the indefinite future. Greece is not far behind. Its current account deficit in 2000–01 was equal to 6–7 percent of GDP, up from 1–2 percent in the early 1990s, and again, the forecasts are for deficits to remain high, in the 5–6 percent range.

This is not the first time that some of the small member countries of the European Union have run large current account deficits. In the early 1980s, for example, Portugal ran deficits in excess of 10 percent of GDP. But those deficits had a very different flavor from today's: Portugal then was still reeling from its 1975 revolution, from the loss of its colonies, and from the second oil shock; the government was running a large budget deficit, in excess of 12 percent of GDP. The current account deficits were widely perceived as unsustainable, and indeed they turned out to be: between 1980 and 1987, the escudo was devalued by 60 percent, and the current account deficit was eliminated. In contrast, Portugal today is not suffering from large adverse shocks; the official budget deficit has been reduced since the early 1990s (although with some signs of relapse in

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2002, as current estimates imply that Portugal may exceed the limits imposed by the 1997 Stability and Growth Pact among the countries participating in European monetary union); and financial markets show no sign of worry.

The fact that both Portugal and Greece are members of both the European Union and the euro area (the group of countries that use the euro as their common currency), and the fact that they are the two poorest members of both groups, suggest a natural explanation for today's current account deficits. They are exactly what theory suggests can and should happen when countries become more closely linked in goods and financial markets. To the extent that they are the countries with higher expected rates of return, poor countries should see an increase in investment. And to the extent that they are the countries with better growth prospects, they should also see a decrease in saving. Thus, on both counts, poorer countries should run larger current account deficits, and, symmetrically, richer countries should run larger current account surpluses.

This paper investigates whether this hypothesis indeed fits the facts. We conclude that it does, and that saving rather than investment is the main channel through which integration affects current account balances.

We proceed in four steps. First, we use a workhorse open-economy model to show how, for poorer countries, goods and financial market integration are likely to lead to both a decrease in saving and an increase in investment, and so to a larger current account deficit. We also discuss how other, less direct implications of the process of integration, such as domestic financial liberalization, are likely to reinforce that outcome.

Second, we look at panel data evidence from the countries of the Organization for Economic Cooperation and Development (OECD) since 1975. We document that the recent changes in the current account balances of Portugal and Greece are indeed part of a more general trend: the dispersion of current account positions among OECD countries has steadily increased since the early 1990s, and current account positions have become increasingly related to countries' income per capita. This trend is visible within the OECD as a whole but is stronger within the European Union, and stronger still within the euro area. The channel through which this occurs appears to be primarily a decrease in saving—typically private saving—in the countries with widening current account deficits, rather than an increase in investment.

Third, we return to the cases of Portugal and Greece. We conclude that the recent history of these two countries is largely consistent with the findings of the panel data regressions. Lower private saving—due to both internal and external financial market liberalization but also to better future growth prospects—and, to a lesser extent, higher investment appear to be the main drivers of the larger current account deficits.

We end by taking up two issues raised by our findings. First, we relate our results to the large body of research triggered by what has been called the Feldstein-Horioka puzzle: the finding of a high cross-country correlation between saving and investment. We show that, consistent with our findings, this correlation has substantially declined over time in this sample of countries, especially within the euro area. At least for this last group, the Feldstein-Horioka phenomenon appears to have largely disappeared. Second, we discuss whether the current attitude of benign neglect vis-à-vis the current account in the euro area countries is appropriate, or whether countries such as Portugal and Greece should take measures to reduce their deficits. We conclude that, as a general rule, they should not.

Current Account Balances and Economic Integration

A country that wants to borrow from the rest of the world must take into account two things: the interest rate it faces, and the price cuts it will need to make to generate sufficient export revenue to repay the debt. In this context, increased financial integration, which brings about a lower or a flatter cost of borrowing, clearly makes it more attractive to borrow. Increased goods market integration, which leads to a more elastic demand for the country's goods, decreases the price cuts required in the future and so has a similar effect. Thus, in response to increased integration, borrower countries will want to borrow more. And, by a symmetric argument, lender countries will want to lend more. The distribution of current account balances will widen.[1]

1. An earlier example of the effects of economic and monetary integration is that of Puerto Rico's integration with the rest of the United States in the early postwar period. Ingram (1962) provides a classic analysis of what happened—an analysis made feasible by the continued collection of statistics on flows even after integration. Between the early and the late 1950s, as a result of increased financial integration, net annual private capital

The purpose of the model described below is to formalize this argument. The model is straightforward but will be useful in organizing the empirical work and discussing some of the policy and welfare issues raised later in the paper.[2]

Think of a group of n countries trading goods and assets among themselves. (For convenience, we will sometimes refer to this group of countries as "the world," but what we have in mind is the set of countries within the trading group.) Each country produces its own good, but households in each country consume the same composite good.

Households live for two periods and maximize utility:

$$\log(C_t) + \log(C_{t+1}),$$

where consumption in each period is given by

$$C \equiv \left(\frac{1}{n} \sum_{i=1}^{n} C_i^{(\sigma-1)/\sigma} \right)^{\sigma/(\sigma-1)},$$

and the intertemporal budget constraint is given by

$$C_t + [(1+x)R]^{-1} C_{t+1} = P_t Y_t + [(1+x)R]^{-1} P_{t+1} Y_{t+1}.$$

In the last equation P is the price of the good produced by the country, in terms of consumption, and R is the interest rate, also in terms of consumption, or the consumption interest rate for short.

The parameter σ in the above identity is the elasticity of substitution among goods, which to satisfy the Marshall-Lerner condition is assumed

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inflows into Puerto Rico from the rest of the United States jumped from 3 percent to 11 percent of Puerto Rico's GDP. Half of these inflows came in the form of direct investment, and the rest in the form of long-term borrowing by local banks; both of these sources of external financing had been virtually nonexistent before the mid-1950s. Investment meanwhile increased from 16 percent to 20 percent of GDP. Puerto Rico's current account deficit with the rest of the United States widened even more, reaching by 1958 a stable level of 12 percent of GDP, and reflecting not only an increase in investment but also a decrease in saving. In a later essay, Ingram (1973) used the experience of Puerto Rico to suggest that a European monetary union would free member states from the link between national saving and investment. Our paper can be seen as testing Ingram's hypothesis.

2. An early model of the evolution of the current account along these lines was developed by Fischer and Frenkel (1974). An overlapping-generations version was later analyzed by Dornbusch (1983).

to be greater than 1. The parameter x is a wedge between the world consumption interest rate and the rate at which a country can borrow. (We are considering here a borrower country.) For the time being, we take production as exogenous. Thus movements in the current account reflect only saving decisions.

With logarithmic preferences, consumption spending in the current period is given by

$$C_t = \frac{1}{2}\left(P_t Y_t + \frac{1}{R(1+x)} P_{t+1} Y_{t+1} \right).$$

Define *ca* as the ratio of the current account balance to national income. Then *ca* is given by

$$ca_t = \frac{1}{2}\left[1 - \frac{Y_{t+1}}{Y_t} \frac{1}{R(1+x)} \frac{P_{t+1}}{P_t} \right].$$

The three terms in the expression in brackets on the right give the determinants of the current account balance:

—*Output growth*. The first term is equal to 1 plus the rate of growth of domestic output. The higher output is next period relative to this period, the larger the current account deficit will be.

—*The interest rate*. The second term gives the effect of the interest rate faced by the country. The higher the consumption interest rate, or the greater the wedge, the more expensive it is to borrow abroad, and thus the smaller the current account deficit.

—*The rate of change in the terms of trade*. The third term is equal to 1 plus the rate of change in the price of the domestic good in terms of consumption. The larger the fall in the price of the domestic good required next period to sell enough domestic goods to pay down the debt, the more expensive it is to borrow, and thus the smaller the current account deficit.

This equation provides the right starting point to show the effect of integration on the current account balance of a country that, like Portugal and Greece, is poorer than its trading partners but catching up. Assume that n is large, so that we can ignore the contribution of the country itself

to world variables.[3] Assume also that all other countries are fully integrated, thus facing the same interest rate R (with no wedge).

Under these assumptions, sum the first-order conditions for the consumer's problem $[1/C_t = R(1/C_{t+1})]$ over countries. Use the fact that aggregate consumption is equal to aggregate income to get

$$R^{-1} = Y_t^* / Y_{t+1}^* = 1/(1+g^*),$$

where Y^* is the average world level of output, and g^* is the world rate of output growth.

Noting that the demand for the good produced in a given country is given by

$$P_t = (Y_t / Y_t^*)^{-1/\sigma},$$

and correspondingly for P_{t+1}, we can express the current account as

$$ca_t = \frac{1}{2}\left[1 - \frac{1}{1+x}\left(\frac{1+g}{1+g^*}\right)^{1-1/\sigma}\right].$$

So, if output growth in the country we are considering exceeds the output growth of its trading partners, and the borrowing wedge x is not too large, the country will run a current account deficit.

Using this expression, we can now return to the effects of integration on the current account balance. For countries such as Greece and Portugal, economic integration has had three main dimensions: the single European market, which mostly affected the product market; the integration of financial markets within the European Union; and finally monetary union, with the adoption of the euro in the late 1990s. All three channels have clearly worked in the direction of potentially widening the current account deficits of these countries.

Since the early 1990s, the *single European market* has led to an increase in σ, the elasticity of demand facing domestic goods within the

3. This assumption is easily relaxed, but at some cost in increased algebraic complexity. Relaxing it introduces an additional effect, the dependence of the slope of the supply of funds on n, the number of trading partners. The larger n, the smaller the effect of borrowing by the country on the equilibrium consumption interest rate, and so the flatter the supply of funds to the country. This provides another dimension of integration, namely, as an increase in n.

European Union. Beyond the elimination of tariffs and a stricter enforcement of competition rules across the European Union, factors such as the harmonization of safety requirements for products and the extension of distribution networks have led to goods being closer substitutes (either in product or in geographic space), and thus to a higher elasticity of demand for each good.[4] As a result, goods market integration has reduced the adverse terms-of-trade effect a country faces when it needs to generate a current account surplus to repay its debt, and this has made borrowing more attractive. Going back to the expression above for the current account, assume that the country in question has a higher growth rate than its trading partners, so that it is running a current account deficit. Then, the higher σ, the larger the deficit.

Financial integration has led to a decrease in the wedge x within the European Union. Beyond the elimination of capital controls and other explicit barriers to financial flows, the harmonization of financial market rules within the European Union has reduced the regulatory uncertainty faced by foreign lenders and has improved the transparency of information on potential borrowers. Thanks to the European Union's "single passport" legislation (the 1993 EU Investment Services Directive that addressed the cross-border activities of all types of financial firms), an EU bank that wishes to do business in another member state no longer needs to set up a full subsidiary and be subject to local regulation and supervision. It can do business there by opening a branch or, even more simply, by operating directly from its home base, where all the key aspects of its solvency, liquidity, and risk are supervised by its home regulator. In parallel, the harmonization of firms' reporting requirements has improved information and decreased the risk faced by foreign lenders. Also, as Pierre-Olivier Gourinchas and Olivier Jeanne have emphasized,[5] by increasing the cost to governments of expropriating foreign lenders and investors, financial integration has decreased the risk of expropriation and thus the risk premium that lenders and investors require.

Monetary union has led to a further decrease in x within the euro area. Monetary union has eliminated currency risk. Foreign exchange risk among the countries of the European Monetary System had already

4. In our specification, σ was formally introduced as a taste parameter. Think instead of our specification of utility as a reduced form reflecting the higher substitutability of products, for whatever reason.

5. Gourinchas and Jeanne (2002).

diminished after the currency realignments of the early 1990s, which eliminated the most obvious cases of overvaluation. Still, the cost incurred by some investors and financial institutions during the crises in the Exchange Rate Mechanism in 1992–93 remained in the memory of market participants. This lingering uncertainty was only really eliminated in the late 1990s, as adoption of the euro became a near certainty. The elimination of currency risk increases the relative importance of other elements of risk. Credit risk has become the most important component of the pricing of a security within the euro area, with the implication that the relative quality of underlying credits, rather than judgments about the stability and volatility of currencies, drives securities prices. All of this obviously makes the "national" dimension of capital flows increasingly fuzzy. Finally, monetary union has led to larger and deeper markets for specific financial instruments, such as euro bonds; we shall see examples of this when we return to the cases of Portugal and Greece.

So far we have focused only on saving, but it is straightforward to introduce investment and build on this simple structure. The results can be easily expressed in words:

—Allow production to depend on capital, and take a country that is poorer (in the sense of having less capital, and thus a higher marginal product of capital) than the others in the group. How much investment takes place will depend both on the cost of borrowing and on the future terms of trade: the lower the relative price of domestic goods in the future, the less attractive it is to invest in the production of domestic goods. Then, for very much the same reasons that economic integration is likely to lead to a decrease in saving, it is likely to lead to an increase in investment. Rather obviously, to the extent that financial integration leads to a lower cost of finance, investment will increase. It will also increase to the extent that goods market integration leads to an increase in the elasticity of demand for domestic goods: the higher the elasticity of demand, the smaller the decrease in price needed to sell the additional output in the future, and so the more attractive investment is this period.

—To the extent that investment increases, this will lead, both directly and indirectly, to a larger current account deficit than in our model above: directly, as the increase in investment is only partly offset by an increase in saving, and indirectly, to the extent that higher investment leads to faster expected growth (an increase in g relative to g^*), higher real income in the future, and so lower saving this period.

—Poorer countries are poorer not only because they have less capital, but also because they have lower total factor productivity. Again, the evidence is that both goods market integration and financial market integration are likely to lead, in particular through higher competition, to an increase in total factor productivity.[6] To the extent that this is the case, it is likely to improve growth prospects in poorer countries and lead to a further decrease in saving.

—Financial integration often comes, at least in part, with domestic financial liberalization. New instruments, such as more-flexible mortgages, may be introduced. To the extent that this is the case, and that domestic financial liberalization leads to lower saving, the effect of integration on the current account will be reinforced.

To summarize, financial market integration and goods market integration are likely to lead, in the poorer countries, to both a decrease in saving and an increase in investment, and so to a deterioration in the current account balance. How much of the adjustment takes place through lower saving, and how much through higher investment, depends among other factors on the relative roles of capital and total factor productivity in explaining differences in income per capita across countries, and on the relative roles of financial integration and financial liberalization.

The Widening of Current Account Balances: Evidence from Panel Data

Having laid out a simple framework, we now return to the data, not only for Portugal and Greece but also for the OECD in general and the European Union and the euro area in particular. To organize the discussion, we typically present results for four groups of countries:

—*OECD minus*. This group consists of all OECD countries except the Republic of Korea, Luxembourg, Mexico, Turkey, and the Central European nations (the Czech Republic, Hungary, Poland, and the Slovak Republic), for a total of twenty-two (out of thirty current OECD members). The reasons for omitting these eight countries vary. The mechanisms behind changes in current account balances in Korea, Mexico, and

6. See, for example, the findings of a recent McKinsey report on France, Germany, and the United States in the 1990s (McKinsey Global Institute, 2002).

Turkey—three much poorer countries—are likely to differ from those in the richer OECD countries. Data for the Central European countries exist only from 1990 on, and so these countries cannot be used when constructing a balanced panel (we briefly report the results from unbalanced panel regressions below). Finally, the economy of Luxembourg is highly idiosyncratic; in particular, Luxembourg consistently reports current account surpluses on the order of 30 percent of GDP.

—*The European Union*. This group consists of the current members of the European Union, again excluding Luxembourg, or fourteen countries in all. The rationale for looking at this subgroup of OECD countries is obvious. If integration is the basic force behind the widening of current account balances, one would expect the effect of the single market to be much stronger for the EU countries than for OECD countries in general.

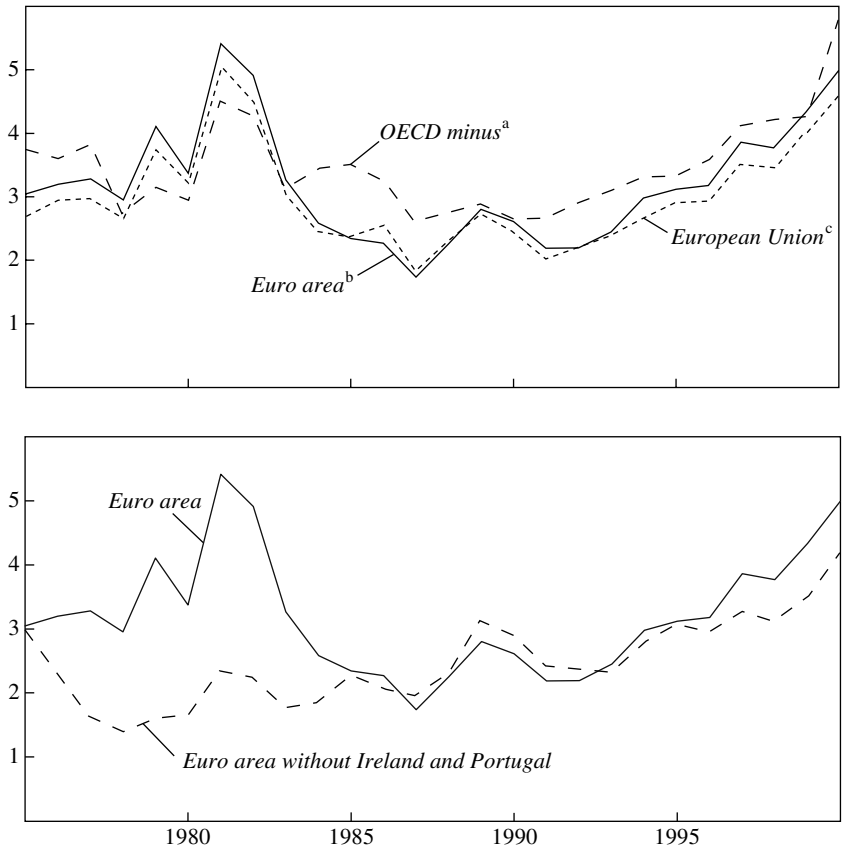
—*The euro area*. This group consists of the countries that have adopted the euro as their common currency, again excluding Luxembourg but including Greece, which joined in 2001, for a total of eleven. The rationale for looking at this group is equally obvious. With the fixing of parities in 1999, and the actual shift to the euro at the end of the 1990s, one would again expect the degree of integration to be stronger among these countries than for the broader EU grouping or, a fortiori, the OECD countries in general.

—*Euro minus*. This is the set of countries just defined minus Greece and Portugal, or nine countries in all. The reason for looking at this subgroup is simply to see whether the results obtained for the euro area are due to these two countries or hold in the rest of the euro area as well.

To start, figure 1 reports, for each group, the standard deviations of member countries' current account balances as a percentage of GDP for each year from 1975 to 2000. Data on current account balances (and later on saving and investment) are from the European Commission's Annual Macroeconomic Database of the Directorate General for Economic and Financial Affairs (AMECO). The data are based on countries' national income accounts and, since 1995, on the EU accounting system ESA95. The numbers do not always match those published by the OECD, which are sometimes based on other sources (for example, the OECD current account data for Greece are based on Bank of Greece data, which are constructed using mainly bank settlement data rather than trade data). The differences can be nonnegligible: in 2000 the current account deficit of Greece was 4.5 percent of GDP according to the European Union, and

Figure 1. Cross-Country Standard Deviations of Current Account Balances for Selected Country Groups, 1975–2000

Percent of GDP



Source: Authors' calculations based on European Commission Annual Macroeconomic Database of the Directorate General for Economic and Financial Affairs (AMECO).

a. All current OECD members except the Czech Republic, Hungary, the Republic of Korea, Luxembourg, Mexico, Poland, the Slovak Republic, and Turkey.

b. All twelve countries that have adopted the euro as their currency, except Luxembourg.

c. Except Luxembourg.

7 percent according to the OECD. But the differences are mostly differences in the levels and not in the changes, and the conclusions below are roughly unaffected by which series we use.[7]

7. A larger issue is whether we should look at the current account balance or the change in the net foreign asset position, which, in principle, includes changes in valuations of

The top panel of figure 1 reports results for each of the first three groups described above. The time series have three characteristics:

—The results are similar across the three groups; indeed, there is no more evidence of increasing dispersion of current account balances for either the euro area or the European Union than for the OECD minus group as a whole.

—There is a sharp but temporary increase in the standard deviation in the early 1980s.

—There is a steady increase in the standard deviation since the late 1980s, leading to a more than doubling of this measure over the last fifteen years.

A further look at the data suggests a sharp difference between the short-lived increase of the early 1980s and the steady increase later on. The increase of the early 1980s is entirely due to large deficits in just two countries, Portugal and Ireland. As the bottom panel of figure 1 shows, when these two countries are left out of the data for the euro area, the peak of the early 1980s completely disappears, and the standard deviation rises more or less steadily from the early 1980s on, with a sharper increase in the 1990s. We have already briefly discussed the 1980s episode in Portugal, which was a period of very large and unsustainable deficits due to the aftermath of the revolution, the loss of colonies, the second oil shock, and a loss of control of fiscal policy. In Ireland, the combination of the oil shock and a fiscal expansion (with fiscal deficits exceeding 12 percent of GDP) also led to very large and unsustainable current account deficits.

The next step is to try to explain which countries have been running larger deficits and which have been running larger surpluses. Basic growth theory and the open-economy model presented in the previous section suggest exploring the relation between income per capita and the current account balance. Countries that are poorer have more potential for catch-up, through either capital accumulation or technological progress.[8]

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assets and liabilities. Because of the measurement issues associated with available series for changes in net foreign assets, we prefer to use the series for the current account balance. For the set of countries we look at, the general trends we describe below are robust to whether one uses current account balances or changes in net foreign asset positions. For more on the relation between the two series, see Lane and Milesi-Ferretti (2001a).

8. For empirical evidence on convergence within the OECD, see, for example, Barro and Sala-i-Martin (1992).

Economic integration makes it easier for these countries to borrow, and thus to run larger current account deficits.

We take a first pass at the data in figure 2, which presents scatterplots of individual country averages of the current account balance as a percentage of GDP against income per capita, for two subperiods, 1985–93 and 1994–2000, and three different groups of countries. Income per capita is GDP per capita at purchasing power parity in 1985 dollars.[9] The choice of 1985 as the starting date for the first subperiod is to avoid the episode of the early 1980s described earlier. Regression results are as follows (with *t* statistics in parentheses; these results are also displayed as regression lines in each panel of figure 2):

OECD minus

1985–93: $CA/GDP = -1.8 + 0.09\ Y/N \quad R^2 = 0.01$
(1.5)

1994–2000: $CA/GDP = -6.8 + 0.49\ Y/N \quad R^2 = 0.13$
(5.2)

European Union

1985–93: $CA/GDP = -1.9 + 0.12\ Y/N \quad R^2 = 0.03$
(2.0)

1994–2000: $CA/GDP = -11.8 + 0.94\ Y/N \quad R^2 = 0.48$
(10.2)

Euro area

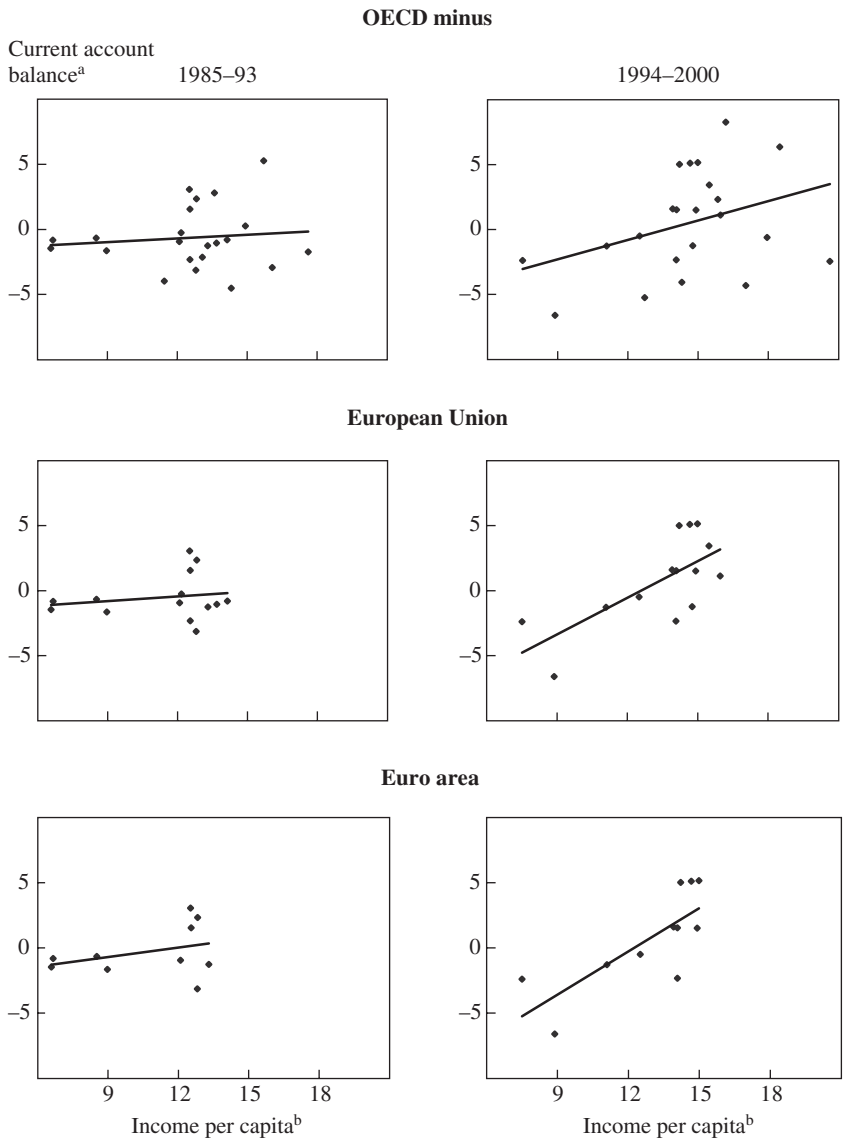
1985–93: $CA/GDP = -2.8 + 0.23\ Y/N \quad R^2 = 0.10$
(3.4)

1994–2000: $CA/GDP = -13.5 + 1.10\ Y/N \quad R^2 = 0.58$
(11.0).

The figure and the associated regressions have two striking features. First, there is a substantial strengthening of the relation between the current account and income per capita from the first to the second subperiod. Except in the euro area, the coefficient is typically insignificant for 1985–93; it becomes much larger and very significant in 1994–2000. Second, the increase is stronger for the European Union than for the OECD as a whole, and stronger for the euro area than for the European Union

9. Data are from the Heston and Summers database up to 1992 and are extrapolated using real GDP growth rates thereafter.

Figure 2. Average Current Account Balances and Income per Capita, Selected Country Groups, 1985–2000



Sources: AMECO and data from Alan Heston and Robert Summers, Penn World Tables (pwt.econ.upenn.edu).
a. Current account balances are expressed as a percentage of GDP.
b. Values are in thousands of 1985 dollars at purchasing power parity.

(although the difference between these two is neither statistically nor economically significant).

Both features are quite consistent with the idea that integration is an important factor in the evolution of the current account balance. Integration was higher to start with within the European Union and the euro area than in the OECD as a whole and has continued at a faster pace. To look at the relation further, we examine the following specification:

$$(CA / Y)_{it} = a_t + b_t \left[\frac{(Y/N)_{it}}{(Y/N)_t} \right] + \mathbf{X}_{it}\beta + \varepsilon_{it}.$$

In this rather standard specification,[10] the ratio of the current account balance to output in year t for country i depends on a common time effect, on the level of income per capita in year t for country i relative to the average level of income per capita in year t for the group of countries under consideration $(Y/N)_t$, and on other control variables included in the vector $\mathbf{X}_{it}$. The only nonstandard aspect of the specification, and the one central to our exploration here, is that we allow the effect of relative income per capita to vary from year to year.

In our basic specification we use two control variables (in addition to the time effects). The first is the dependency ratio, constructed as the ratio of population to the labor force: other things equal, we expect a country with a relatively higher dependency ratio to save less. The second is the rate of growth of output from year $t - 1$ to t, included to capture cyclical effects of movements in output on the current account. The theory we outlined earlier suggests that integration may also affect the elasticity of the current account with respect to cyclical movements; for this reason we also allow the effect of output growth to vary from year to year. (The results are nearly identical if we use the measure of the output gap constructed by the OECD, which aims at capturing cyclical movements in output.) The period of estimation runs from 1975 to 2001. The starting year is constrained by the availability of comparable data on saving, which we use when we analyze the components of the current account separately below.

10. For recent surveys and extensions of the literature of the determinants of current accounts, see, for example, Debelle and Faruqee (1996) and Chinn and Prasad (2000).

The simplest way to present our results is by plotting the set of estimated coefficients b_t against time. The top left panel of figure 3 shows such a plot for OECD minus. The coefficient is nearly always positive, but there is no obvious trend. In other words, the widening of the distribution of current account balances does not appear to reflect an increased dependence of the current account on the level of income.

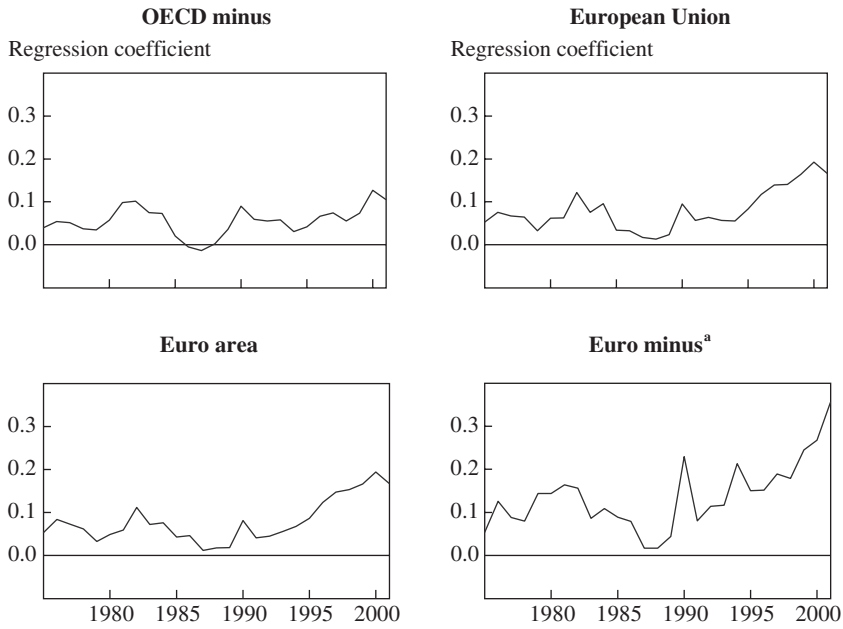
The top right panel of figure 3 does the same for the European Union. Here the pattern of the estimated coefficients over time resembles that of the standard deviation of the current account balance in figure 1. The high deficits of the early 1980s in both Portugal and Ireland, two relatively poor EU countries, lead to a temporary increase in the coefficient. One also sees a steady increase in the coefficient from the late 1980s on. By the mid-1990s the coefficient becomes both statistically and economically significant. The estimated coefficient of 0.2 in 2000 implies that, other things equal, for a country with an income per capita 40 percent below the EU average (roughly the case for Portugal and Greece), the ratio of the current account balance to GDP should be 8 percentage points lower than the EU average. (In 2000–01 the current account for the European Union was roughly balanced, and the deficit for Portugal was, as we have seen, roughly 10 percent of GDP.)

The bottom left panel of figure 3 plots the same coefficients for the euro area. These coefficients look very much the same as those for the European Union—not a great surprise given the large overlap between the two groups. Finally, the bottom right panel shows the results for the euro minus group, to assess the influence of Portugal and Greece. The increase in the coefficient is actually larger in the 1990s when Portugal and Greece are left out: the coefficient reaches 0.35 in 2001.

In short, figure 3 suggests that, for the European Union, the widening of current account positions can be largely accounted for by an increased dependence of the current account balance on income per capita. The effect seems weaker, if present at all, for the OECD. And there is no strong evidence of an additional euro effect.

To explore the robustness of these results, we have examined a number of alternative specifications. One such specification is motivated by the idea that income per capita may be a poor proxy for what we are trying to capture. Although convergence of income per capita appears to hold for the set of countries we are looking at, some of the poorer countries may have a bleak future. Some richer countries may be more appealing to for-

Figure 3. Yearly Coefficients of Current Account Balances on Output per Capita from Panel Regressions, 1975–2001



Source: Authors' regressions discussed in the text using data from AMECO and from Penn World Tables.
a. Euro area as previously defined except Greece and Portugal.

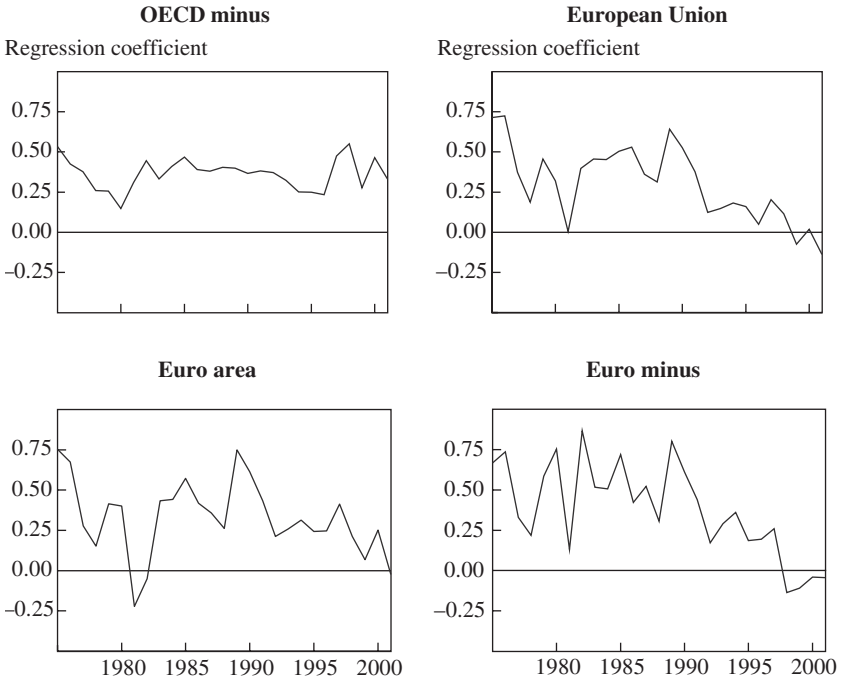
eign investors, for reasons having to do both with expected return and with risk characteristics; think, for example, of the United States and its long string of current account deficits.[11] This suggests replacing income per capita in our regressions with the initial net asset position of the country, again interacting its coefficient with time.[12] Presumably, if a country has been borrowing steadily in the past, so that its asset position is negative, it has characteristics that are attractive to foreign investors. Further financial and economic integration are then likely to allow for more foreign inflows, and thus larger current account deficits.

Figure 4 shows the set of estimated coefficients from a regression in which foreign assets per capita in 1990 rather than income per capita is

11. This theme has been explored, both theoretically and empirically, by Ventura (2002) and Lane and Milesi-Ferretti (2001b).

12. For more on the relation between foreign asset positions and income per capita, see Lane and Milesi-Ferretti (2001a).

Figure 4. Yearly Coefficients of Current Account Balances on Foreign Assets per Capita from Panel Regressions, 1975–2001



Source: Authors' regressions discussed in the text using data from AMECO and from Lane and Milesi-Ferretti (2001a).

used as an independent variable. Data on net foreign assets come from Philip Lane and Gian Maria Milesi-Ferretti and are in millions of dollars.[13] (Regressions using either foreign assets per capita in 1980, or foreign assets per capita for each year, give very similar results.) Because the level of foreign assets can be positive or negative, we cannot use the same normalization as for income per capita; we use instead the difference between foreign assets for country i in year t and the average for the relevant group of countries in year t.

The main conclusions we draw from figure 4 are twofold. First, the coefficients are typically positive: countries that have borrowed in the past tend to run current account deficits. This conclusion has been well documented by others. Second, there is, however, no evidence that the

13. Lane and Milesi-Ferretti (2001a).

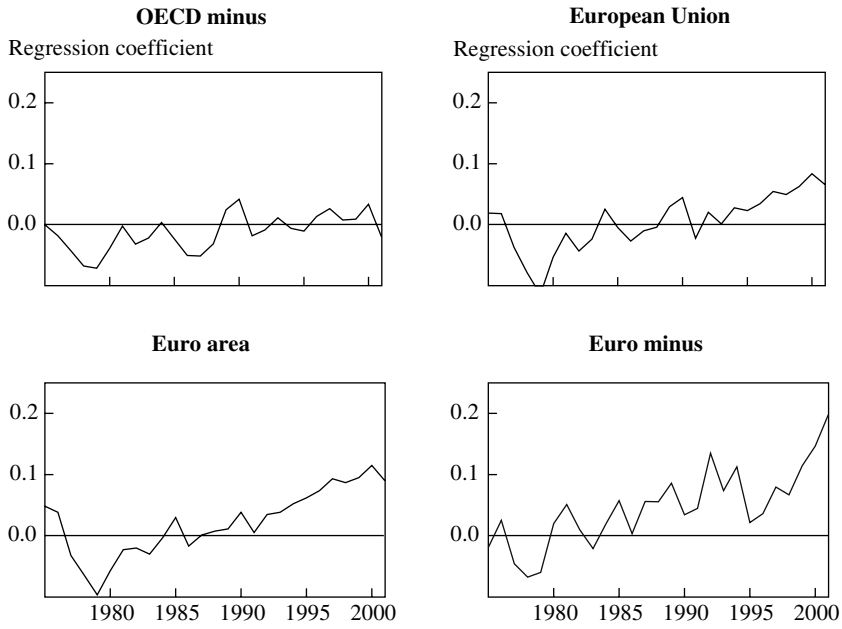
relation between the current account balance and the financial asset position has become stronger over time. For the OECD minus, the coefficients are typically significant but show no trend. And for the European Union and the euro area the trend is clearly in the other direction, with a steady decrease in the coefficient over time.

Another alternative specification is motivated by the fact that the current account reflects the behavior not only of private saving and investment but also of public saving. Unless Ricardian equivalence holds, public saving is likely to affect total saving, and thus the current account. And one of the principal trends of the 1990s has been, as a result of the 1992 Maastricht Treaty, a strong improvement in the fiscal positions of most EU countries.

We therefore explored a specification that adds another control variable to the basic specification, namely, the ratio of the structural primary government balance (as constructed by the OECD) to GDP for each year and each country. The results are easy to summarize. For all four groups of countries, the coefficient on the fiscal variable is tightly estimated and very significant. For the OECD as a whole, an increase in the structural primary balance of 1 percent of GDP leads to an improvement in the current account of 0.2 percent of GDP. The estimates are nearly identical for the European Union and the euro area. But the time series of the estimated coefficients on income per capita is nearly identical to that in figure 3 (and therefore we do not report them here). In other words, the increased widening does not appear to stem from a divergence in levels of public saving across countries.

A third alternative specification adds to the sample the EU accession countries—those countries in Central and Eastern Europe that are candidates to join the European Union—on grounds that this could in principle provide an excellent test of our hypothesis: these countries are poorer than the current EU members, expect to grow rapidly after joining, and, in preparation for entry, have undergone some internal liberalization and have started to remove some barriers to economic integration. The problem with these countries is, as already mentioned, that the necessary data are unavailable before the early 1990s. When we include these countries in the regressions reported above, rerun over the much shorter sample period, the results confirm those presented above. This is hardly surprising, because most accession countries ran large current account deficits in the 1990s: the average ratio of the current account balance to GDP for

Figure 5. Yearly Coefficients of Saving on Income per Capita from Panel Regressions, 1975–2001



Source: Authors' regressions discussed in the text using data from AMECO and from Penn World Tables.

1993–2001 was –3.6 percent for the Czech Republic, –4.9 percent for Hungary, –3.7 percent for Poland, and –5.0 percent for the Slovak Republic.

Saving or Investment?

Finally, we turn to the question of whether the increased dependence of current account balances on income per capita reflects an increased dependence of saving or an increased dependence of investment. To address this question we simply reran the basic specification, replacing the ratio of the current account to GDP first with the ratio of saving to GDP and then with the ratio of investment to GDP. Figure 5 shows the results of the saving regressions. We draw two conclusions:

First, for the OECD as a whole, there is not much evidence of a significant effect of income per capita on saving, and no evidence of a trend. Saving appears to be unrelated to the level of income per capita. The coefficient tends to be negative (lower income per capita leads to higher saving) for most of the 1980s, and close to zero for most of the 1990s, and the value for 2001 is roughly equal to the value for 1975.

Second, for both the European Union and the euro area, there is much clearer evidence of a trend. After a sharp decline in the 1970s, the coefficient steadily increases over time, both in the 1980s and in the 1990s. Interestingly, the coefficient also changes sign: at the start of the sample, saving is negatively related to income per capita—the opposite of what the standard open-economy growth model predicts. The relationship turns positive in the late 1980s, and the coefficient becomes larger in the euro area than in the European Union. Integration per se does not easily explain the change in sign, and this suggests the presence of other factors at work, such as financial development or financial liberalization. Poorer countries have introduced new financial instruments and institutions, which may have led to a decrease in saving. This, combined with integration, may have led to larger current account deficits.

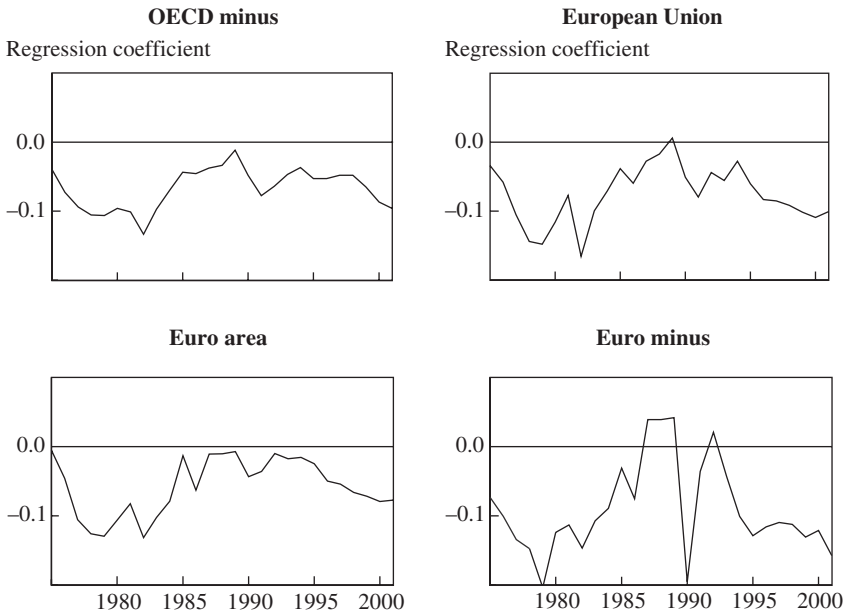
Figure 6 shows the results of the investment regressions. We again draw two conclusions. First, the coefficient is typically negative: a lower income per capita is associated with higher investment, as predicted by the standard model.

There is, however, no evidence of a trend toward a more negative effect of income per capita on investment over time. (The coefficient steadily decreases starting in the mid-1990s, but this decline is too small and too recent to qualify as a trend.) In short, the increased dependence of current account balances on income per capita reflects, for the most part, an effect through saving rather than an effect through investment.

The importance of the effect through saving suggests the relevance of trying to separate the effects of integration and internal financial liberalization. With this in mind, we explored the effects of introducing as an additional control the ratio of M3 (a broad money measure) to GDP; this ratio is often taken as a proxy for the stock of debt instruments available to firms and households, and thus as a proxy for financial deepening.[14]

14. See, for example, King and Levine (1993) for a use of this ratio as a measure of financial development in standard growth regressions.

Figure 6. Yearly Coefficients of Investment on Income per Capita from Panel Regressions, 1975–2001



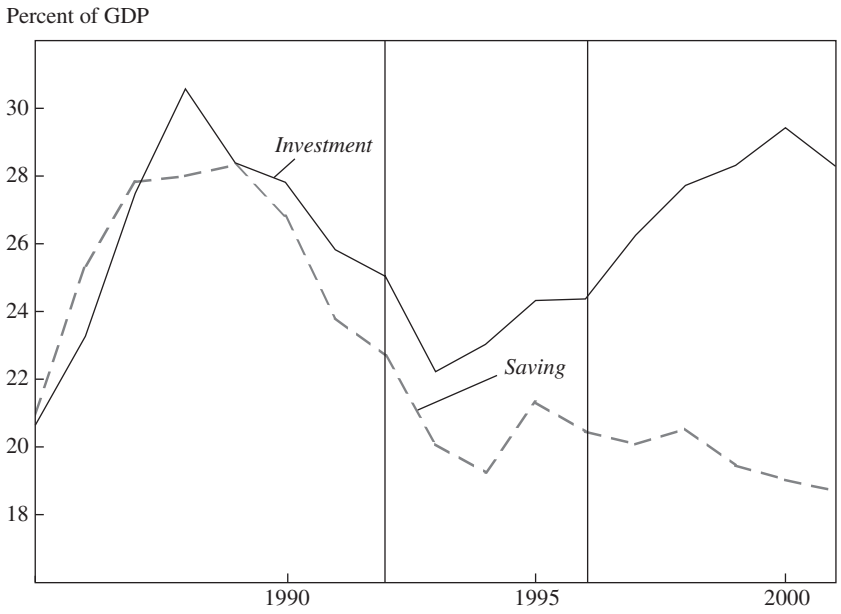
Source: Authors' regressions discussed in the text using data from AMECO and from Penn World Tables.

The results show that current account balances are strongly negatively related to the ratio of M3 to GDP, suggesting that internal financial liberalization does play an independent role in determining the cross-country distribution of current account balances. The effect is both statistically and economically significant: an increase in the ratio of M3 to GDP of 30 percentage points (as happened, for example, in Greece in the 1990s) is estimated to lead to a decrease in the ratio of the current account to GDP of about 1.2 percentage points. But introducing this additional control does not significantly affect the coefficients on relative income per capita.

Back to Portugal and Greece

Panel data regressions can only take us so far; often one gets a better sense of the underlying mechanisms by looking at individual countries.

Figure 7. Portugal: Investment and Saving, 1985–2001[a]



Source: AMECO.
a. Vertical lines correspond to breaks between subperiods in table 1.

This is what we do in the present section, where we return to the experiences of Portugal and Greece.

Portugal

Figure 7 shows Portuguese investment and saving, as ratios to GDP, from 1985 to 2001. It clearly shows the steadily increasing divergence between the two, and the resulting steady increase in the current account deficit, starting in the 1980s.

In trying to assess how much of the change in the current account deficit is due to a change in saving or to a change in investment, one must be careful in the choice of a base period. The early 1990s in Portugal was a period of slow growth for cyclical reasons and so is not the right base period. Thus in table 1 we divide the data into three subperiods. The first is 1985–91 (1985 was the first year after stabilization,

Table 1. Portugal: Current Account Balance, Investment, and Saving, 1985–2001
Percent of GDP

Item	*1985–91*	*1992–95*	*1996–2001*	*2000–2001*	*Change, 1985–91 to 2000–01*
Current account	0.6	–2.0	–7.0	–10.0	–10.6
Investment	25.3	22.8	26.6	28.1	2.8
Saving	25.9	20.8	19.5	18.1	–7.8
Public	4.6	2.3	2.6	2.4	–2.2
Private	21.3	18.5	16.9	15.7	–5.6
Household	9.2	8.3	5.7	5.4	–3.8
Corporate	12.1	10.2	11.2	10.3	–1.8

Sources: European Commission, *Statistical Annex of European Economy*, Spring 2002; data from the Direcção Geral de Estudos e Previsão.

following the large fiscal and current account deficits discussed earlier; 1991 was the last year of sustained growth). This subperiod saw an average annual growth rate of GDP of 5.1 percent. The second is 1992–95, a period of slow growth and therefore unusually low investment and saving, with an average annual GDP growth rate of 1.5 percent. The third is 1996–2001, a period of sustained growth averaging 3.5 percent a year. Finally, to show what has happened recently, we also present numbers for 2000 and 2001, when GDP grew by 3.3 percent and 1.9 percent, respectively. The far right-hand column reports the differences in the numbers from the 1985–91 subperiod, which we take as the base period, to the 2000–01 subperiod.

The data for public, private, and household saving underlying the numbers in table 1 are adjusted for inflation. More specifically, using information about the composition of public debt by currency denomination, we add to the official number for public saving an amount equal to inflation times the proportion of the public debt denominated in domestic currency times the debt. (The adjustment matters very much, as annual inflation decreased from an average of 14 percent over 1985–91 to 7 percent over 1992–96 and 3.5 percent since; the average ratio of public debt denominated in domestic currency to GDP has remained stable at around 50 percent.) We subtract a similar amount from private saving, and so leave unchanged the official number for the current account. This amounts to assuming that all public debt denominated in domestic currency is held

domestically; in the absence of series on domestic and foreign holdings of public debt, no obviously better adjustment is feasible.[15]

Allocating the inflation adjustment for private saving between household and corporate saving is much more difficult.[16] It depends, for example, on whether government bonds are held by households or financial intermediaries and, in the latter case, on the types of liabilities issued by these intermediaries. Further adjustments should also be made for corporate bonds and other nominal corporate liabilities and for mortgages and other nominal household liabilities. We could not obtain sufficient data to do these adjustments.[17] Therefore we instead use a simple rule: we subtract the full inflation adjustment on government debt from household saving. This implicitly assumes that all public debt is held (directly, or indirectly through intermediaries with nominal liabilities) by households rather than corporations. Again, in the absence of relevant data, one has little choice but to make that assumption. We make no adjustment for other nominal liabilities.

Figure 7 and table 1 suggest four conclusions:

—The increase in the current account deficit dates back to the late 1980s but accelerated in the second half of the 1990s. When 1985–91 is used as the base period, the current account deficit has increased by 10.6 percent of GDP.

—Less than one-third of the increase in the current account deficit is due to an increase in investment. The ratio of investment to GDP has increased by 2.8 percentage points relative to 1985–91. The increase is much larger (5.3 percentage points) if we compare the ratio to its value in the early 1990s, but much of that increase is cyclical, reflecting the slow growth of that period.

15. Estimates from the Bank of Portugal for the 1990s indicate that the proportion of government debt held by nonresidents remained low until the mid-1990s (when the inflation adjustment matters most): it was 10 percent in 1990 and still only 17 percent in 1996. Since then the proportion has increased steadily, reaching 47 percent in 2001.

16. For a recent exploration of the minefields associated with the construction of economically meaningful series for household saving in the United States, see Gale and Sabelhaus (1999).

17. Estimates from the Bank of Portugal for the 1990s indicate that at least 80 percent of the government debt held domestically was held either by households or by financial institutions with nominal liabilities on the liability side.

—More than two-thirds of the increase in the current account deficit is due to a decrease in saving. The ratio of saving to GDP has decreased by about 7.8 percent of GDP relative to its 1985–91 value.

—The decrease in saving reflects primarily a decrease in private saving. Public saving has decreased by 2.2 percent of GDP relative to 1985–91; private saving has decreased by 5.6 percent of GDP. (Inflation accounting is important here: without the inflation correction, public saving would show a rise of 3.1 percent of GDP, and the decrease in private saving would be a much larger 10.9 percent of GDP.)

—The decrease in private saving reflects primarily a decrease in household saving. The ratio of household saving to GDP has decreased by 3.8 percentage points, and the ratio of corporate saving by 1.8 percentage points. (Without the inflation correction, household saving would show a decrease of 8.3 percent of GDP.)

We now look at some aspects of the story behind these numbers. Take the decrease in *household saving* first. From 1995 to the end of 2001, household debt increased from 40 percent to 93 percent of GDP. Most of this increase took the form of either mortgages or consumer loans from banks. At the end of 2001 mortgages represented 39 percent of total bank loans to the nonfinancial private sector and 76 percent of total loans to households.

Why has there been such an increase in household debt? We could not find substantive changes in the types of financial products, mortgages or loans, offered by banks. The decrease in interest rates must be a central part of the story: short-term nominal interest rates have decreased sharply, from 16 percent a year in 1992 to around 4 percent in 2001 (for the euro area as a whole the numbers are 11 percent and 4 percent). Real short-term interest rates (nominal interest rates minus realized inflation, measured using the GDP deflator) fell from 6 percent in 1992 to roughly zero in 2001. (This is more than for the euro area as a whole, where real rates fell from 7 percent to around 3 percent; in part because of the Balassa-Samuelson effect, inflation is higher in Portugal than the average for the euro area.)

Why the low interest rates? Apart from factors common to the OECD, much of the decline is clearly traceable to financial integration. Adoption of the euro has eliminated country risk. And it has opened the euro interbank loan market to Portuguese banks, a much more liquid market than the

small domestic market in which they previously had to operate if they did not want to face currency risk. The specific instrument Portuguese banks have used has been international bonds issued through subsidiaries: the yearly flow of new international bond issues through these subsidiaries increased from €½ billion in 1998 to €6 billion in 2000. The maturity of these bonds (whose legal status is generally that of subordinated debt) is between three and five years, and the currency of denomination is the euro.

Looking at the capital account shows the role that foreign borrowing by domestic banks played in Portugal's financing of its current account deficit. The net foreign debt position of Portuguese banks has increased from €10 billion in 1999 to €24 billion in 2001. In 2000 the increase in net indebtedness of resident Portuguese banks was equal to 10.7 percent of GDP—hence exceeding the current account deficit in that year. (We are not singling out banks arbitrarily here; all other portfolio and investment flows are small in comparison.)

Given the growth in mortgage loans, one would have expected the increase in *investment* to reflect disproportionately an increase in housing investment. Curiously, this is not the case. For most of the 1990s, housing prices increased at a rate only slightly above inflation. Residential investment has remained a nearly constant fraction of total fixed investment, between 21 and 23 percent—a fact for which we have no explanation.

Another apparently puzzling development, in view of the theory sketched above, is the poor performance of foreign direct investment (FDI). Net FDI, which had been an important source of capital inflows following Portugal's entry into the European Union in 1986, turned negative in 1995 and has remained negative since then. Here, looking at gross flows helps solve the puzzle. In the late 1980s, following EU accession, FDI into Portugal had increased rapidly, reaching 4 percent of GDP in 1990. But thereafter the inflows slowed, reaching a near standstill in 1995. Since 1995, inflows have again increased, and in 2000 they stood at twice their 1990 level (in dollars), the previous peak. Outflows, however, which had been roughly unaffected by EU accession, have increased even faster, reaching 5 percent of GDP in 2000. Thus the emergence of negative net FDI since 1995 is the outcome of a rapid increase in both inflows and outflows, but with outflows increasing more rapidly than inflows.

Most Portuguese direct investment abroad takes the form of acquisitions, and much of it, 40 percent of all outflows, goes to Brazil. (Direct

investment outflows to other EU countries amount to only 15 percent of all outflows.) Our interpretation of this fact is that it is, somewhat paradoxically, the result of financial integration within the euro area, and of the role that information plays in direct investment flows. Our guess, based on the large volume of euro-denominated bonds issued by Portuguese firms, is that European direct investment in Brazil is carried out mainly through Portugal, which presumably has a comparative advantage in understanding business in that country. This comparative advantage is not new. What is new, following the advent of the euro, is the ability of Portuguese firms to raise funds in a euro area–wide capital market to finance their foreign acquisitions.

We see the picture that emerges from our description of trends in Portugal as consistent with that from our panel data regressions. It is one in which integration, especially financial integration (rather than domestic financial liberalization), has led to lower saving and, to a lesser extent, to higher investment. Together these have led to larger current account deficits.

There is, however, an alternative view of the current account deficit in Portugal, one based on loss of competitiveness and currency overvaluation. This view points to the decline in Portugal's exports, due to their unfavorable specialization. In 1999, clothing and footwear, goods that are among the most exposed to competition from developing countries, accounted for 20 percent of Portugal's exports. According to this view, the rate at which Portugal joined the euro, together with nominal rigidities, led to an overvalued currency, and this in turn has led to a current account deficit.

Separating out the role of overvaluation from that of the mechanisms we have focused on in this paper is far from straightforward, both conceptually and empirically. But we see the overall evidence in favor of overvaluation as weak. First, from the trade balance side, most of the current account deficit is the reflection of an unusually high growth rate of imports, rather than an unusually low growth rate of exports. Second, one would expect overvaluation, and thus low demand for domestic goods, to be associated with unusually slow GDP growth, yet this has not been the case. Third, an index of Portuguese unit labor costs relative to twenty-two industrial countries stood at 109.4 in 1995, and 103.8 in 1998, and is 108

in 2002.[18] This suggests that overvaluation is at most a minor factor in explaining Portuguese current account deficits.

Greece

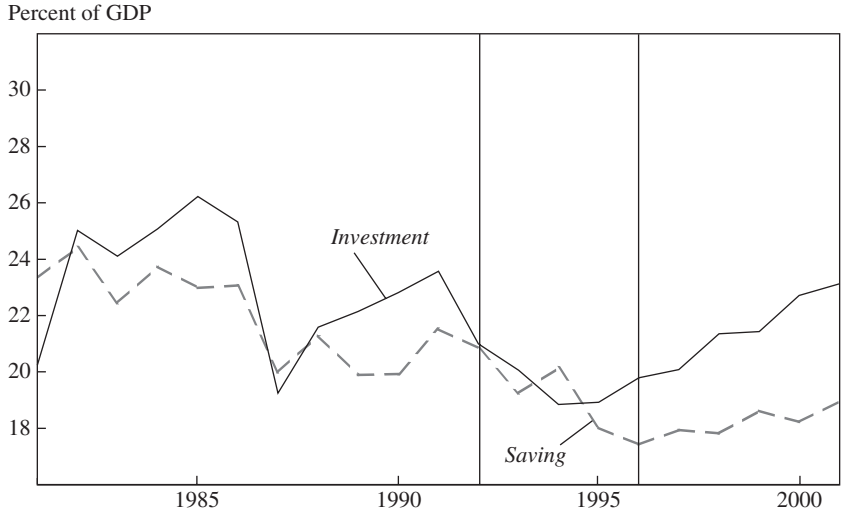
Figure 8 shows Greek investment and saving, as percentages of GDP, from 1981 to 2001. It shows that the divergence between investment and saving is more recent there than in Portugal, dating back only to the mid-1990s.

Table 2 presents the basic numbers. One must again be careful about the choice of a base period. Like Portugal, Greece went through a recession in the mid-1990s, and using that period as the base would therefore be misleading. Thus, in presenting the data we divide the entire period into three subperiods: 1981–91 (1991 was the last year of sustained growth), with an average annual GDP growth rate of 2.5 percent; 1992–95, a period of slow growth, with an average growth rate of 0.8 percent; and 1996–2001, a period of sustained growth, with an average growth rate of 3.5 percent. To show recent developments, we also present numbers for 2000 and 2001. When reporting changes, we compare the numbers for 2000–01 with those for 1981–91.

Greece is one of the countries for which the numbers reported by the European Union differ the most from those reported by the OECD. There are basically two time series for the Greek current account balance. The series reported by the Bank of Greece, and used by the OECD, is mainly based on information on international transactions collected by commercial banks. The other series, used in the national accounts and by the European Union, is mainly derived from customs and value-added tax information. Both sources have become less reliable over time: the first because the removal of currency restrictions has reduced the information available to commercial banks; the second because of the gradual elimination of customs controls on intra-EU trade. We report both sets of numbers in the first two lines of table 2, but, for consistency with the numbers for the other variables, we base the rest of our analysis (and figure 8) on the EU numbers. Although the levels of the current account deficit according to the two sources are different, the increase in the deficit is

18. As computed by the European Union and reported in *European Economy,* Spring 2002; the base year for the index is 1991. The U.S. index from the same source provides a useful comparison: it increased from 100 to 130 over the 1995–2002 period.

Figure 8. Greece: Investment and Saving, 1981–2001[a]



Source: AMECO.
a. Vertical lines correspond to breaks between subperiods in table 2.

roughly the same: 3.5 percent of GDP according to the European Union, and 2.5 percent according to the OECD.

The numbers in the table are adjusted for inflation in the same way as for Portugal.[19] Again, the adjustment matters a lot: annual inflation has decreased from 19.1 percent during 1981–91 to 12.4 percent during 1992–95 and 4.2 percent since 1996 (it stands at around 3 percent today). Gross public debt increased from 35.9 percent of GDP in 1985 to 67 percent in 1992.

Figure 8 and table 2 suggest four conclusions:

—The increase in Greece's current account deficit does not reflect an increase in investment. The ratio of investment to GDP in 2000–01 was the same as in the base period, 1981–91. The proposition that entry into European Monetary Union, and later the euro area, was accompanied by an investment boom is only the result of an inappropriate comparison

19. Estimates from the Bank of Greece indicate that, until the mid-1990s, the proportion of government debt held by nonresident holders was low. Just as in Portugal, it has recently increased, from 20 percent of total debt in 1997 to 45 percent in 2001.

Table 2. Greece: Current Account Balance, Investment, and Saving, 1981–2001
Percent of GDP

Item	*1981–91*	*1992–95*	*1996–2001*	*2000–2001*	*Change, 1981–91 to 2000–01*
Current account[a]	–0.9	–0.2	–3.3	–4.4	–3.5
Current account[b]	–4.0	–1.4	–4.6	–6.5	–2.5
Investment	22.9	19.7	21.3	23.0	0.1
Saving	22.0	19.5	18.2	18.6	–3.4
Public	1.0	2.2	3.8	5.3	4.3
Private	21.0	17.3	14.4	13.3	–7.7
Private saving		*1995*	*1997*	*2000*	
Household	n.a.	6.8	7.6	6.7	
Corporate	n.a.	10.7	7.0	6.4	

Sources: European Commission, *Statistical Annex of European Economy*, Spring 2002; data from the Bank of Greece.
a. European Union Annual Macroeconomic Database of the Directorate General for Economic and Financial Affairs, ESA 95 basis.
b. OECD current account data, based on Bank of Greece figures.

with the recession of the early 1990s and the sharp fall in capital formation that occurred then.

—By implication, all of the 3.5-percentage-point increase in the current account deficit can be traced to a decrease in saving, which fell by 3.4 percentage points.

—This decrease in saving is more than fully accounted for by an even larger decrease in private saving, which fell by 7.7 percent of GDP, whereas public saving increased by 4.3 percent of GDP. This is very different from the Portuguese experience: there, as table 1 showed, both private and public saving decreased. In Greece the swing in (inflation-adjusted) private saving has been twice as large as in Portugal but has been partly offset by the increase in (also inflation-adjusted) public saving.

—The decomposition of saving into corporate and household saving can only be made from 1995 on. Based on this information, it appears that much of the decrease in private saving comes from a decrease in retained corporate earnings rather than a decrease in household saving. (Again, the inflation correction is important, as inflation fell from 9 percent in 1995 to about 3 percent in 2000. Omitting the inflation correction, the ratio of household saving to GDP shows a decline of about 5 percentage points from 1995 to 2000.)

We now look at some aspects of the story behind these numbers. The decline in corporate saving reflects a clear shift in the financing of firms

from internal finance to share issues. The flow of capital raised in the stock market went from zero in 1995–96 to 8 percent of GDP in 2001. A plausible explanation is the stock market boom that lasted from early 1998 to the end of 1999.

One might have expected the decrease in retained earnings to lead to an increase in household saving (although this may be assuming too much rationality on the part of stockholders). There was no such increase. Household saving has remained flat since 1995. The volume of consumer loans, which equaled 1.6 percent of GDP in 1995, now equals 6 percent. The volume of mortgage loans meanwhile has risen from 4.5 percent of GDP to 12 percent. It is clear that, in contrast to Portugal, domestic financial liberalization is playing an important role here: consumer loans were virtually prohibited until 1997. Financial integration in turn has allowed this decrease in saving to show up as an increase in the current account deficit, rather than as a decrease in investment.[20]

In contrast to Portugal, net FDI flows to Greece have remained positive (but small). As in Portugal, however, small net flows hide a more complex reality. They are the result of Greek direct investment in the Balkan region and the Mediterranean (over one-third of total Greek FDI), compensated by direct investment in Greece from the rest of the European Union. (Even gross flows, however, are not very large, at around 3 percent of GDP.)

Finally, as in the case of Portugal, there is little evidence that the increase in the Greek current account deficit is primarily the result of a lack of competitiveness, possibly arising from a too-strong exchange rate for conversion of drachmas into euros. The index of Greek unit labor costs relative to twenty-two industrial countries was 112 in 1995 and 119 in 1999 and is 111 in 2002.[21]

To summarize, the story for both Portugal and Greece is generally consistent with the theme of the first section of this paper and the panel data evidence in the second section. Financial integration and financial liberalization have made it easier to borrow, and easier to borrow abroad. The move to the euro appears important. The resulting elimination of

20. Isaac Sabethai of the Bank of Greece has suggested to us an alternative explanation for the decrease in saving: with the increasing integration of Greece in the European Union has come an attempt on the part of Greek consumers to catch up with EU consumption standards.

21. *European Economy,* Spring 2002; again the base year is 1991.

exchange rate risk is leading to additional borrowing in euros by Portuguese banks and to purchases of Greek government bonds by foreign investors—the latter has become one of the largest items in the financing of the Greek current account deficit.

The effect on investment has been surprisingly limited. (The effect on Portuguese investment of entry into the European Union in 1986 was much stronger.) This suggests that it takes more than integration to increase capital flows—a conclusion often reached about FDI flows in particular. FDI movements in both countries are interesting, with increased gross flows and geographic specialization but modest net flows.

The action appears to have occurred mostly through saving. Here it is tempting, despite the obvious warnings about the interaction between public and private saving, to link some of the differences across the two countries to differences in public saving. One of the reasons why Greece has a smaller current account deficit than Portugal may be the fact that Greece went through a substantial fiscal consolidation, whereas Portugal did not.

In this context it is interesting to note what has happened in Ireland. Like Portugal and Greece, Ireland was once one of the poor countries of the European Union: GDP per capita (at purchasing power parity) in 1987 was about 70 percent of the EU average. Thanks to rapid growth since the late 1980s, Ireland has more than fully caught up and now has a GDP per capita 20 percent above the EU average.[22] Yet during most of that period Ireland has run a current account surplus, not a current account deficit. The proximate cause is a large increase in saving: from 1987 to 2000 Ireland's ratio of saving to GDP increased from 16.2 percent to 24.1 percent, roughly in line with the increase in the ratio of investment to GDP. In turn, the proximate cause of this increase in saving was a large increase in public saving. From 1987 to 2000 the government's primary balance shifted from a deficit of 3.4 percent of GDP to a surplus of 5.5 percent. Taking one step back, it is clear that this increase in public saving has been the result of rapid economic growth—and thus high potential revenue growth—and fiscal consolidation. This suggests that the difference between Ireland and the other two relatively poor EU countries stems in part from the differing trends in public saving, itself due in part to more rapid GDP growth.

22. For an analysis of the Irish miracle see Honohan and Walsh (2002).

Extensions and Conclusions

We conclude by relating our findings to the long-standing puzzle first noted by Martin Feldstein and Charles Horioka, namely, why investment and saving rates within a country are so highly correlated both across time and across countries, and by considering whether the high current account deficits of the poorer European countries have implications for their macroeconomic policy.

Back to the Feldstein-Horioka Puzzle

Our findings are obviously closely related to the Feldstein-Horioka puzzle and the subsequent research that has attempted to solve it. Our findings of an increasing positive dependence of saving on income per capita and a negative dependence of investment on income per capita raise the possibility that this correlation between national saving and national investment has decreased through time.[23]

With this in mind, we explore the relation between investment and saving across countries and time. We do so by running two sets of regressions. First, we run conventional Feldstein-Horioka regressions of investment on saving, over different periods:

$$(I/Y)_{it} = a + b(S/Y)_{it} + \varepsilon_{it},$$

where $(I/Y)_{it}$ and $(S/Y)_{it}$ are ratios of investment and saving to GDP, respectively, in country i and year t. Table 3 shows the estimated values for b, first from estimation over the whole period 1975–2001, and then over two subperiods, 1975–90 and 1991–2001, for each of our four groups of countries. (For comparison with other studies, results are also presented for the group of all OECD countries; that panel, however, is not a balanced panel, because, again, observations for the Central European countries from before 1990 are missing.)

23. The large literature triggered by the original paper (Feldstein and Horioka, 1980) has pointed out that the high correlation is not necessarily a puzzle (see, for example, the discussion in Obstfeld and Rogoff, 1996). Even in a fully integrated economy, in which investment decisions do not depend on domestic saving, some shocks will move saving and investment in the same direction, generating a positive correlation between the two. If these shocks dominate, the correlation will be high. Our purpose here is to document what has happened to this correlation over time and relate it to our findings, not to take a stand on whether or not a puzzle exists.

Table 3. Estimated Feldstein-Horioka Coefficients, 1975–2001[a]

Period	*OECD*	*OECD minus*	*European Union*	*Euro area*	*Euro minus*
1975–2001	0.58	0.51	0.47	0.35	0.39
1975–1990	0.56	0.55	0.50	0.41	0.49
1991–2001	0.57	0.38	0.36	0.14	0.26

Source: Authors' regressions.
a. Results of regressions of investment on saving, both as a percentage of GDP.

Table 3 suggests two main conclusions:

—The coefficient in the original Feldstein-Horioka regression, run on a sample of sixteen OECD countries over the period 1960–74, was 0.89. When Maurice Obstfeld and Kenneth Rogoff ran the same regression on a sample of twenty-two OECD countries over the period 1982–91, they obtained a coefficient of 0.62.[24] Our results for the OECD as a whole give a coefficient of 0.58, with no evidence of a decline in the coefficient over time.

—As we move from the OECD to the European Union and to the euro area, however, the coefficient steadily declines, suggesting steadily higher degrees of integration. It also declines over time, reaching much lower values in the 1990s. The coefficient for the euro area for 1991–2001 is only 0.14.[25]

To look at the evolution of the relation between investment and saving more closely, we then run the following regression:

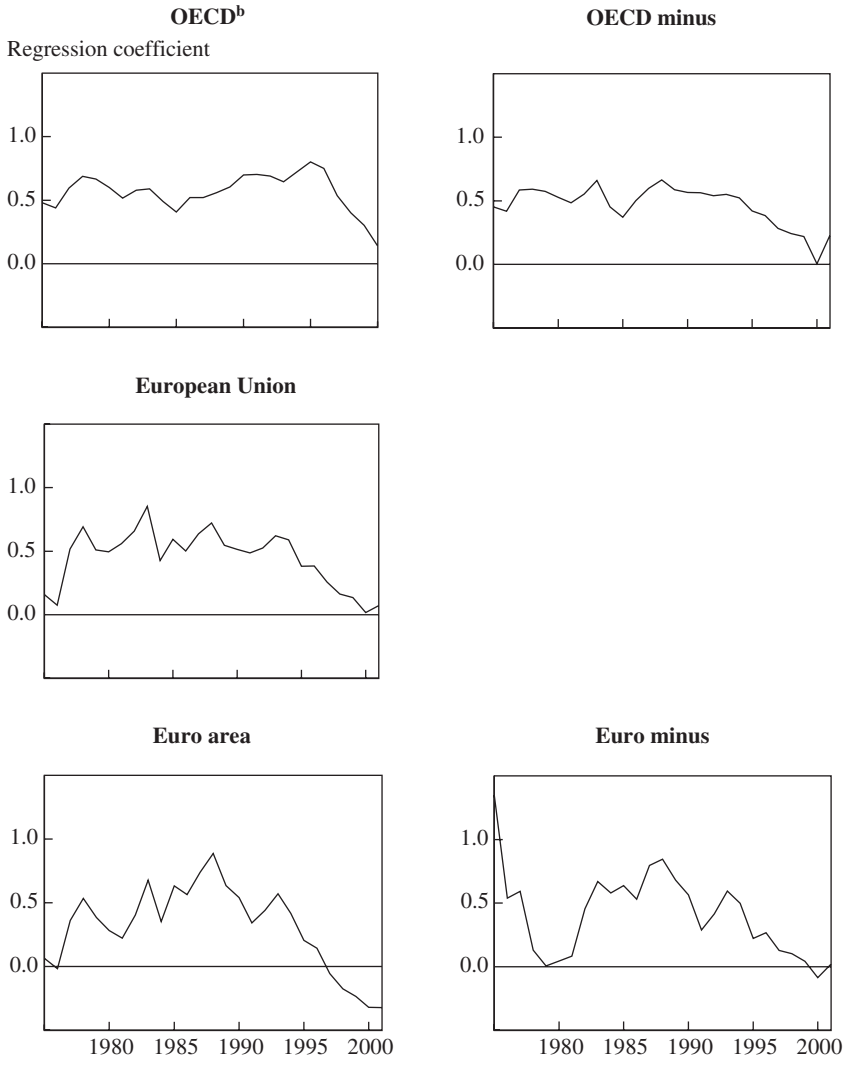
$$(I/N)_{it} = a_t + b_t(S/Y)_{it} + \varepsilon_{it}.$$

That is, we allow for both year effects and year-specific coefficients on saving. Figure 9 plots the time series for estimated b_t for our four groups of countries plus the OECD as a whole. The five panels confirm and amplify the results from table 3:

24. Obstfeld and Rogoff (1996).

25. Part of this decrease may reflect not integration itself, but rather a side effect of integration, namely, the adoption of similar national income accounts, such as the ESA 1995 norms for the European Union. Suppose, for example, that, before such adoption, one country had high measured investment and saving, and another country had low measured investment and saving. The cross-country correlation between investment and saving across the two countries would be high. If, however, this high correlation reflected different definitions of saving and investment, adoption of common accounting rules would make the levels of saving and investment more similar, reducing the cross-country correlation.

Figure 9. Yearly Coefficients of Investment on Saving from Panel Regressions, 1975–2000[a]



Source: AMECO.

a. Investment and saving are both expressed as a percentage of GDP.

b. All thirty current members, except Luxembourg.

—The coefficient for the OECD as a whole does not show much of a decline in b_t over time, except in the second half of the 1990s, with a partial reversal in 2001.

—The coefficient for OECD minus shows more of a steady decline over the 1990s. The coefficient at the end of the period is close to zero.

—The coefficients for the European Union and the euro area show an inverse-U shape, with the coefficient initially increasing from a value close to zero in 1975, and then steadily declining from the late 1980s on. The last panel, which shows the coefficient for the euro minus group, does not exhibit the low value of the coefficient at the start, and so indicates that the low initial value in the other panels comes again from the experience of Portugal and Ireland in the late 1970s and early 1980s.

—For the European Union and the euro area, the estimated coefficient is close to zero or even negative at the end of the 1990s. Our earlier results suggest a natural interpretation: to the extent that investment and saving depend with opposite signs on income per capita, and to the extent that integration reinforces these two effects, the estimated coefficient from a regression of investment on saving may well be negative, and this may be what we are observing at the end of the period.

In short, for the countries of the European Union, and even more so for the countries of the euro area, there no longer appears to be a Feldstein-Horioka puzzle. In highly integrated regions, investment and saving appear increasingly uncorrelated.[26]

Is Benign Neglect the Optimal Policy Response?

So far, the attitude of both the European Commission and the European Central Bank toward the Portuguese and Greek current account deficits has been one of benign neglect. The same attitude prevails in the United States regarding the deficits of individual states. Indeed, the current account balances of individual states are not even recorded.[27] Is the same

26. Andrew Rose (2000, 2002) has argued that currency unions lead to a large increase in gross trade flows. Our findings can be seen as extending his, by showing that they also allow for large increases in net trade flows: countries belonging to a currency union trade more and can run larger net positive or negative current account balances.

27. This is what made the study of Puerto Rico by Ingram we discussed earlier so interesting. For some time after integration, Puerto Rico continued to collect the statistical information needed to track its current and capital accounts.

attitude justified for the countries of the euro area? Let us briefly review what theory tells us.

First, if these current account deficits had their origin in large fiscal deficits, issues of intergenerational distribution would obviously arise. Greater government debt would mean higher taxes in the future, and thus a larger burden on future generations. But in this case the issue is moot: as we have seen, the current account deficits have their origin in private saving and private investment. The consumers taking out mortgages in Portugal are the ones who will have to repay them, not future generations. They may be too optimistic about their future income prospects, but we do not typically think of this as a reason for macroeconomic policy intervention.

Even so, ever since the work of Peter Diamond on overlapping-generations economies,[28] we know that, in a closed economy, individual saving decisions may be privately optimal but still lead either to an inefficient aggregate outcome (in the case of dynamic inefficiency) or to one with unappealing implications in terms of intergenerational distribution. If today's consumers save little, the capital stock will be smaller, and so will be the income of future generations. Thus, in a closed economy, low private saving may well justify government intervention on behalf of future generations, for example in the form of higher public saving.

This last argument becomes weaker, however, when the economy is open.[29] Consider, for example, the limiting case in which the economy is open and fully integrated in world financial markets, and the elasticity of demand for domestic goods is infinite—in effect, a "one-good" world. Then the issue of intergenerational redistribution becomes irrelevant. Saving decisions in the country have no effect on investment in the country, and thus no effect on future output or on the income of future generations. The same integration that leads to larger current account deficits also reduces their implications for intergenerational distribution.

This limiting case is too strong, however. Even countries in the euro area are short of being fully integrated and surely face downward-sloping demand for their goods. And so, to the extent that large current account deficits today will require trade surpluses in the future, they also will

28. Diamond (1965).

29. See Buiter (1981) for an analysis of the overlapping-generations model in an open economy.

require low relative prices for domestic goods in the future, and thus lower income (in terms of consumption) for future generations. In this case the legacy of high current account deficits is not low capital, but their adverse effect on future terms of trade. This provides an argument for higher public saving today, but that argument seems empirically weaker than the standard closed-economy capital accumulation argument.

Another line of argument relies on the presence of other market imperfections. The most obvious one, in the case of the euro area, is nominal rigidities. Indeed, one of the standard problems in common currency areas is that of adjustment of relative prices across countries. Granted the presence of nominal rigidities, the question is what implications this has in this case. Let us again review the basic theory.

Under flexible prices the increase in the current account deficit comes with a real appreciation, an increase in the relative price of domestic goods. Later on, when the time comes to repay or service the increased debt, the need to generate a trade surplus requires a real depreciation.

If prices are rigid (or at least do not fully adjust), and output is determined by demand, the initial real appreciation will be less than would take place under flexible prices. The shifts in saving and investment we discussed in the first section of the paper will then lead to both an increase in output above its natural level and a smaller current account deficit than would be the case under flexible prices.

How nominal rigidities affect what happens in the future depends on the exact nature of these rigidities. If prices do not fully adjust in the future when the time comes to repay or service the debt (a more doubtful proposition than that in the previous paragraph, as this is both a slow and a very predictable event), the attempts of consumers and firms to repay or service the additional debt will, in the future, lead to a decrease in output below its natural level—that is, to a recession—and through that mechanism to the trade surplus needed to repay or service the debt. To the extent that future prices can adjust, the trade surplus will be generated through depreciation rather than a decrease in output. Because repayment is likely to take place gradually (as opposed to the rapid repayment required in currency crises), that case strikes us as a more reasonable working hypothesis.

Now let us turn to implications for fiscal policy (the Greek and the Portuguese governments obviously have no control over monetary policy, and because of the symmetry between current account surpluses and

deficits across countries in the euro area, the European Central Bank has no reason to respond by changing monetary policy):

—If the governments of Portugal and Greece do not change their fiscal stance, the shifts in saving and investment in response to integration will lead to output in excess of its natural level. This in turn will lead to higher inflation than in the rest of the euro area, and thus eventually generate the required real appreciation.

—If those governments decide instead to maintain output at its natural level, say, through higher public saving, they will, by implication, reduce the current account deficit. Under the assumption that the marginal propensity to import is the same for all types of spending (consumption, investment, or government), the use of fiscal policy to maintain output at its natural level will imply eliminating the current account deficit altogether.

—Only a formal quantitative model can tell us exactly what fiscal policy should be in this case. But it surely should not fully offset the increase in private spending so as to maintain output at its natural level. This would have the implication of largely or fully eliminating the current account deficit, thus losing one of the main benefits of economic integration, namely, the ability to reallocate consumption and investment intertemporally. So, although benign neglect may not be optimal, it appears to be a reasonable course of action.

Should euro area members follow the example of U.S. states and stop collecting current account statistics? Probably not, for at least three reasons. First, the fact that European product markets are not yet fully integrated implies that the changes in relative prices required to service or repay the debt remain larger than in the United States. For this reason, policymakers will want to know how much foreign debt a country is accumulating. Second, the potential output costs of adjusting relative prices—through a recession that reduces the inflation rate below the EU inflation rate—is another reason to worry about the level of foreign debt. Finally, euro area fiscal rules may prove weaker than those that stop U.S. states from running large budget deficits. In such a situation, knowing the effect of the budget deficit on the current account will be essential.

Comments and Discussion

Willem H. Buiter: This paper by Olivier Blanchard and Francesco Giavazzi addresses two distinct issues. The first concerns the behavior of the current account in a country that is undergoing greater international financial and trade integration while, starting from low levels of productivity and income per capita, catching up with, or converging on, the higher productivity of its main trading partners. The paper argues, from both theoretical considerations and empirical observation—based mainly on the experience of countries that have joined or are about to join the European Union and Economic and Monetary Union (EMU)—that convergence plus greater international integration means larger current account deficits in these countries.

This issue is of particular interest to me because of my recent work in and on the Central and Eastern European candidate countries for EU accession. These ten countries moved very swiftly from almost perfect financial and trade autarky vis-à-vis the market economies outside the Soviet bloc to a high degree of international financial and trade integration with the West. They also started from low levels of income and productivity per capita. In quite a few of these countries, especially the Baltic states, large and persistent current account imbalances fit the authors' story—that of catch-up, integration, and (a worsening) current account, or CICA—quite well.

Second, the paper argues that, as financial and trade integration proceeds among a group of countries, we should see a greater uncoupling of

The opinions expressed are those of the author. They do not necessarily represent the opinions of the European Bank for Reconstruction and Development.

national saving from domestic capital formation. The Feldstein-Horioka puzzle becomes less puzzling. This applies not only to poorer, less developed countries but also to countries at comparable levels of development and income per capita.

My comments will deal only with the CICA nexus. Unlike the Feldstein-Horioka puzzle, the CICA nexus has important policy implications, relating to the assessment of whether current account imbalances are sustainable. As regards Feldstein-Horioka, I will only state the view that running regressions of the investment rate on the saving rate is one of the more pointless exercises in open-economy macroeconometrics, even when the regression includes time-varying parameters. There must be fifty different ways to account for changes in the contemporaneous correlation between saving and investment. No matter what pattern one finds in the data, the questions "and?" and "so what?" are unavoidable. For instance, a country could have a perfect positive correlation between saving and investment while running a persistent current account deficit of 25 percent of GDP. And? So what? I will show that, in the authors' model, perfect international financial integration will produce a current account balance that is always zero. Of course, the current account is likewise always zero if there is no international financial integration at all.

CATCH-UP, INTEGRATION, AND THE CURRENT ACCOUNT. Rather few explicit theoretical underpinnings are available to constrain the estimating equations that can be taken to the data, and part of what is available does not get used in the authors' specifications. Only household saving is modeled, and the current account surplus as a fraction of national income is the same as the household saving rate. Household saving is driven by the gap between current income and the present value of future income (or between current income and permanent income). Because the logarithmic utility function used by the authors has exactly offsetting income and substitution effects, a lower interest rate reduces saving only through a valuation effect: a lower discount rate increases the present value of future income, as long as future income is positive.

Formally, consumption in period 1 by residents of country k is given by

$$C_1^k = \frac{1}{2} W_1^k, \qquad k = 1, \ldots, N, \tag{1}$$

where W_1^k is the present value in period 1 of household lifetime resources in country k.[1] Let $Y_{j,k}$, $j = 1,2$; $k = 1,\ldots, N$ be the endowment in period j of country k (that is, country k's GDP) and $P_{j,k}$ the price of that endowment in terms of the composite consumption good. With a completely nondiversified portfolio of real assets—the only case the authors consider—only residents of country k can possess title to country k's endowment stream. The present value of household lifetime resources in country k is given by

$$W_1^k \equiv P_{1,k}Y_{1,k} + [R(1+x)]^{-1}P_{2,k}Y_{2,k}. \tag{2}$$

Equations 1 and 2 and the general-equilibrium solutions for $P_{j,k}$, $j = 1,2$ and R imply that country k's current account surplus as a fraction of national income in period 1 is given by the last expression in equation 3:

$$ca_1^k = \frac{1}{2}\left[1 - \frac{P_{2,k}Y_{2,k}}{R(1+x)P_{1,k}Y_{1,k}}\right] = \frac{1}{2}\left[1 - \left(\frac{1}{1+x}\right)\left(\frac{1+g}{1+g^*}\right)^{\frac{\sigma-1}{\sigma}}\right]. \tag{3}$$

Higher output in the rest of the world than in country k improves country k's terms of trade (that is, raises the relative price of country k's output). Increased trade integration is modeled as an increase in σ, the (absolute value of the) price elasticity of demand for country k's output, assumed to exceed 1. It is clear that a higher domestic growth rate relative to the foreign growth rate, a smaller wedge x (the authors' metric for deviations from full financial integration), and a higher σ (the authors' metric for the degree of international trade integration) all are associated with a smaller current account surplus or a larger deficit. These results are not, however, robust to relaxing the assumption of unitary elasticity of intertemporal substitution. A sufficiently low intertemporal elasticity of substitution could dominate the valuation effect of changes in the wedge,

1. If the instantaneous utility function were of the constant elasticity of intertemporal substitution type, the first-period consumption function would be $C_1^k = \frac{1}{1+[(1+x)R]^{\mu-1}}W_1^k$, where $\mu > 0$ is the elasticity of intertemporal substitution.

and a smaller wedge could be associated with a smaller current account deficit or a larger surplus.[2]

If we add investment to the model, a reduction in the wedge is likely to raise investment in most conventional models of investment. If low output per capita is due to a shortage of capital, and if the marginal productivity of capital decreases with the capital-labor and capital-output ratios, we would expect to see a higher rate of investment in poorer countries. Under these conditions, investment therefore reinforces the effect of reductions in x and greater trade integration on the current account operating through the saving channel.

The authors argue, correctly, that EU membership has made for greater trade and financial integration for those countries that are members. For late-joining EU members that started off at a much lower level of output per capita than the existing EU average, such as Portugal, Greece, and especially Ireland, rapid catch-up growth would be expected. EMU membership further reduces the wedge and increases the substitutability between domestic and foreign goods. All these factors make for larger current account deficits in the new members. In addition, increased international financial integration was accompanied by domestic financial liberalization. This, too, may reduce private saving.

The issue has important policy implications. If we can quantify the equilibrium (and optimal) current account deficits of countries in the process of real convergence, domestic and international policymakers will gain important guidance about when actual current account deficits become excessive or even unsustainable. Those would be very useful benchmarks, for instance, for the ten EU accession candidates from Central and Eastern Europe. Such quantitative benchmarks were not part of this paper, however.

FINANCIAL INTEGRATION: BEYOND THE X-FACTOR. The authors adopt a narrow perspective on international financial integration. Formally, greater integration is captured exclusively by a reduction in the wedge

2. In the case of constant elasticity of intertemporal substitution, the current account surplus would be given by $ca_t^k = \left(\frac{1}{1+(1+x)^{(\mu-1)}(1+g^*)^{\left(\frac{\mu-1}{\mu}\right)}}\right)\left[1-\left(\frac{1}{1+x}\right)\left(\frac{1+g}{(1+g^*)^{\left(\frac{\sigma-\mu}{\sigma-1}\right)\frac{1}{\mu}}}\right)^{\frac{\sigma-1}{\sigma}}\right]$. If the intertemporal elasticity of substitution μ is sufficiently below 1, a lower value of the wedge x would raise household saving and increase the current account surplus.

between the domestic and the foreign interest rate; this reduces the rate of return to saving and the cost of capital in the domestic economy. It is true that in the European Union, and a fortiori in EMU, risk-free nominal rates have converged. However, modeling financial integration as a reduction in *x* has two weaknesses.

First, although greater financial integration may well reduce the cost of capital for domestic investors (enterprises) in countries that are catching up, it is not at all obvious that it would also reduce the risk-adjusted expected rate of return available to domestic savers. Lack of international financial integration tends to go hand in hand with domestic financial underdevelopment and financial repression, including large spreads between domestic borrowing and lending rates. These spreads reflect domestic monopoly power, risk that cannot be diversified effectively within the domestic economy, and high intermediation costs resulting from suboptimal scale, organizational slack, and X-inefficiency (not *x*-inefficiency!) in domestic financial institutions and markets. It is quite possible that financial integration would raise the risk-adjusted real rate of return to domestic savers at the same time that it reduces the cost of capital for enterprises engaged in domestic capital formation. In the authors' model, private saving would increase with greater international financial integration.

It would not have been difficult to address directly what are *empirical* issues about movements over time in rates of return to saving and in the cost of capital, and about the interest sensitivity of private saving and investment in countries engaged in catch-up. It is unclear why the authors did not do so and instead opted to bundle untested hypotheses about these two issues and many other issues into the composite hypothesis that is ultimately taken to the data.[3]

Second, international financial integration is not just about more efficient intertemporal trade. It also permits more effective international risk sharing. It might appear that including enhanced diversification among the benefits of financial integration would strengthen the negative effect on private saving of greater financial integration. If the private sector is not only risk-averse but also cautious or prudent, there will be a motive

3. For household saving to tell us all we need to know about private saving, we must be in a Modigliani-Miller world where the corporation is only a veil. For private saving to tell us all we need to know about national saving, we must be in a world with debt neutrality or Ricardian equivalence, where government borrowing is only a veil.

for precautionary saving. Enhanced international risk sharing will then cause household saving to decline.[4]

More advantageous intertemporal trade and precautionary saving do not exhaust the list of possible effects of financial integration on private saving behavior. Full financial integration would allow national consumers to diversify their portfolios, including their ownership claims on real resources such as national endowment streams (equity). In the authors' model each country specializes in the production of a single good, *and* the residents of a country own, in addition to the internationally traded risk-free financial asset, only their own country's endowment stream. This is an extreme form of home bias in the equity portfolio. In a risky world the risk-averse residents of a country would not put all their equity eggs into one basket. If all equity were traded, there would exist a "pooling equilibrium," as described by Robert Lucas, in which each country's residents would own a share of the world portfolio.[5] If each country's consumers hold the world portfolio, then in the formal model considered in the paper, differences in growth rates between domestic outputs would not affect the consumers of different countries differently, nor would changes in σ or any other shock, and there would be no effect on current accounts. Thus the achievement of full international financial integration (including unrestricted international risk sharing) could break any link between national growth rates and national saving rates. The CICA nexus vanishes. This is easily demonstrated formally.

Let the shares of country j's endowment in periods 1 and 2 owned by residents of country k be denoted $\alpha_{k,j}$ and $\beta_{k,j}$, respectively. If completely unrestricted international portfolio diversification were possible, the present value of the lifetime resources of country k's households would be

$$W_k^1 \equiv \sum_{j=1}^{N} \left(\alpha_{k,j} P_{1,j} Y_{1,j} + \frac{\beta_{k,j} P_{2,j} Y_{2,j}}{R(1+x)} \right). \tag{4}$$

The extreme home bias case considered by the authors given in equation 2 above corresponds to $\alpha_{k,k} = \beta_{k,k} = 1$ and $\alpha_{k,j} = \beta_{k,j} = 0$, $k \neq j$.

4. See, for example, Kimball (1990) and Parker and Preston (2002). The logarithmic utility function in the authors' example exhibits caution, as the third derivative of the instantaneous utility function is positive.

5. Lucas (1982).

National income for country k in period 1 is $\sum_{j=1}^{N} \alpha_{k,j} P_{1,j} Y_{1,j}$. *Domestic* income for country k in period 1 is $P_{1,k} Y_{1,k}$. The current account surplus of country k, as a fraction of national income, is given by

$$ca_1^k \equiv \frac{\sum_{j=1}^{N} \alpha_{k,j} P_{1,j} Y_{1,j} - C_1^k}{\sum_{j=1}^{N} \alpha_{k,j} P_{1,j} Y_{1,j}} = \frac{1}{2}\left(1 - \frac{\sum_{j=1}^{N} \beta_{k,j} P_{2,j} Y_{2,j}}{R(1+x)\sum_{j=1}^{N} \alpha_{k,j} P_{1,j} Y_{1,j}}\right). \tag{5}$$

Consider the special case of international portfolio diversification where the representative consumer in country k holds a constant fraction of the world portfolio, that is, a claim to a common, constant fraction of each country's endowment in both periods: $\alpha_{k,i} = \beta_{k,i} = \alpha_k > 0$. The current account balance of country k in period 1 then becomes

$$ca_1^k = \frac{1}{2}\left(1 - \frac{\sum_{j=1}^{N} P_{2,j} Y_{2,j}}{R(1+x)\sum_{j=1}^{N} P_{1,j} Y_{1,j}}\right). \tag{6}$$

Note that $\frac{\sum_{j=1}^{N} P_{2,j} Y_{2,j}}{\sum_{j=1}^{N} P_{1,j} Y_{1,j}} = 1 + g^*$, where g^* is the growth factor of world real output (measured in units of the composite consumption good). The global capital market equilibrium gives us $R = 1 + g^*$. Country k's current account balance is therefore given by

$$ca_1^k = \frac{1}{2}\left(1 - \frac{1}{1+x}\right). \tag{7}$$

The interest rate wedge x experienced by country k has been tagged onto the model of Stanley Fischer and Jacob Frenkel in an ad hoc manner that does not address general-equilibrium considerations.[6] There is no counterpart anywhere else in the world economy to country k's x. It is not

6. Fischer and Frenkel (1974).

clear whether x represents a real resource cost to the world economy as a whole or a transfer from borrowers to lenders, or who bears any real resource cost or receives the transfer. We are not given enough information to determine whether the way in which x is added to the Fischer-Frenkel model represents a proper or an improper use of the small-country assumption. With $x = 0$, country k's current account surplus for the stock market economy (an economy in which claims to all endowment streams are traded) is given by the following transparent (and testable) expression:

$$ca_1^k = 0. \tag{8}$$

I recognize that, for a perfectly pooled risk-sharing equilibrium to exist, all assets would have to be traded, including human capital. In practice we continue to observe a marked, albeit slowly diminishing, home bias in most countries as regards the ownership of stocks and shares.[7] Human capital cannot be traded, for legal reasons, either within countries or across national boundaries.[8] We are a long way from a global pooling equilibrium.

Nevertheless, the extent of international risk sharing is increasing steadily. For the ten countries scheduled to become members of the European Union in 2004, the opportunity for their pension funds to access the EU-wide financial markets represents a big step away from financial autarky.

The implications of increasing financial integration are clearly not exhausted by a consideration of what happens to x. Greater financial integration would also have to include a move from a situation where $\alpha_{k,k} = \beta_{k,k} = 1$ and $\alpha_{k,j} = \beta_{k,j} = 0$, $k \neq j$ to one where $\alpha_{k,k}, \beta_{k,k} < 1$ and $\alpha_{k,j}, \beta_{k,j} > 0$, for at least some $k \neq j$.

THE EMPIRICS OF THE CICA HYPOTHESIS. The main empirically estimated relationship differs in important ways from equations 2 and 3, unless a number of auxiliary and untested (but testable) conditions are met:

7. See, for example, Obstfeld and Rogoff (2000).

8. Private investors could, however, trade synthetic (contingent) claims whose payoffs could replicate those of GDP or of labor income. (See, for example, Shiller and Schneider, 1998, and Shiller and Athanasoulis, 2000.)

$$(9) \qquad ca_t^k = a_t + b_t\left(\frac{Y_{kt} / N_{kt}}{Y_{*t} / N_{*t}}\right) + X_{kt}\beta + \varepsilon_{kt}.$$

The model of household saving used by the authors suggests a specification of the estimating equation that includes as regressors either the world real interest rate, the wedge x and the gap between current income per capita and permanent income per capita in country k, or the wedge x and the gaps between current income and permanent income in country k and in its trading partners. Of these we find only country k's current income per capita relative to the average income per capita of its trading partners. It is unlikely that the omitted variables—either the world real rate of interest, the wedge x and permanent income (or its proxy) in country k, or the wedge and the gap between permanent income in country k and average permanent income in the trading partners—are orthogonal to the included regressors. The resulting estimates are therefore likely to be both biased and inconsistent. Using the initial net foreign asset position of a country to capture the missing variables requires maintaining too many further untested hypotheses to be helpful.

It is especially troubling that the authors have decided to maintain the assumption of convergence of country k's productivity level toward that of its trading partners.[9] Convergence could and should have been tested for the countries in the sample using the available data on output per capita. The evidence reported in the "conditional convergence" literature on convergence within the group of OECD (or the EU, or the EMU) countries is mixed at best.[10] One could very easily reject equation 9 even if the authors' model of saving (and investment) is correct, and one could accept equation 9 even if the authors' assumptions about saving and investment behavior are incorrect. Although I recognize that any statistical test is subject to type I and type II errors, I would still insist on warning against type III errors, that is, not being sure as to exactly what is being tested, because of too many jointly maintained hypotheses. Because the mapping from the theoretical model to the estimating equation is

9. The growth rate of output in country k is included among the additional regressors $\mathbf{X}_{kt}$, but it is given a cyclical rather than a longer-term catch-up or convergence interpretation.

10. See Quah (1993a and b), Bernard and Durlauf (1996), and Durlauf and Quah (1999).

tenuous at best, we end up none the wiser about the validity of the authors' key hypothesis, namely, that financial and trade liberalization implies larger current account deficits for converging countries, and that EU accession and EMU membership are examples of this mechanism at work. I believe they are correct, but this paper does not contain any robust evidence to support the claim. The more detailed narratives of the Greek and Portuguese experience since their EU accession fit the CICA mechanism. Ireland provides an emphatic rejection. Further work, bringing theory and empirics closer together, is required.

Pierre-Olivier Gourinchas: This is a very nice paper. It is simple and intuitive and elegantly fits an interesting fact to the theory. Blanchard and Giavazzi argue that large current account deficits in Portugal and Greece, two small and relatively poor members of the European Union, are exactly what the neoclassical growth model predicts should happen when such economies integrate their financial and goods markets with the rest of the world. And that these large deficits are not cause for worry.

Why should current account deficits in poorer countries increase with integration? Theory emphasizes two channels:

—*Faster conditional convergence and catch-up*: Financial market integration, coupled with monetary union, reduces the cost of capital and eliminates currency risk. Cheap capital stimulates investment, while low interest rates and increased future wealth lower saving. Meanwhile product market integration reduces the adverse terms-of-trade effect that accompanies the need to generate a given trade surplus in the future, effectively making borrowing even cheaper.

—*Productivity catch-up*: Through increased competition or better discipline, integration improves domestic total factor productivity (TFP), which increases the country's growth prospects.

The authors present evidence that largely supports the theory: the dispersion of current account deficits across European countries has increased in the last five years. Poorer European countries tend to run larger deficits, and more so now than in the past, so that, finally, the high correlation between national saving and private investment—the Feldstein-Horioka puzzle—has largely disappeared for this group of countries. The authors provide detailed evidence for Portugal and Greece that emphasizes the importance of financial integration working through

a decline in real interest rates (Portugal) or through an easing of the credit constraints on firms (Greece).

The paper provides a very convincing account and delivers a welcome piece of good news. After all, many emerging market economies have experienced a rather bumpy ride as they liberalized their goods and financial markets. Globalization, it seems, has not been a smooth process. Evidence that the standard theory performs well, at least for some European countries, is therefore reassuring. It leads to the natural conclusion that the gains from integration are there and that they should be driven by the channels mentioned above: conditional convergence and productivity catch-up. It also underlies the authors' normative conclusion that the recent current account developments are—to a first order—optimal.

My comments will address each point in turn. First, I will argue that conditional convergence and productivity catch-up have quite different welfare implications. In particular, the estimated welfare benefits from conditional convergence are relatively small for Portugal and Greece compared with the potential benefits from productivity catch-up.

Second, I will show that more is at play than the simple conditional convergence story. Productivity growth in Greece and Portugal has been faster than in other European countries. More generally, poorer OECD countries have experienced faster TFP growth. This strengthens the argument for laissez-faire, since productivity growth provides first-order welfare gains.

Third, to the extent that income per capita converges among members of the European Union, a central implication of the theory is that greater cross-country dispersion in current accounts should be matched by lower income inequality. Here the data do not oblige: the evidence indicates that income inequality has increased, not decreased, over the recent past. This casts some doubts on the mechanism that the paper emphasizes.

All this indicates that the normative conclusions that the authors reach may not be warranted. Large current account deficits, even when a consequence of credible financial integration, may lead to situations of illiquidity. Some strictly positive amount of insurance, in the form of a government surplus, may be necessary.

CONDITIONAL CONVERGENCE AND THE BENEFITS OF OPEN CAPITAL MARKETS. The paper emphasizes the benefits of both product and financial market integration. Yet it should be clear that financial integration is

the key ingredient. Product market integration is only relevant in the paper insofar as it facilitates intertemporal lending and borrowing.

So we may ask a simple question: how much benefit can a small, open economy like Portugal or Greece reap from financial integration? In the standard neoclassical growth framework, open financial markets bring about faster convergence toward a country-specific steady state. How beneficial is this conditional convergence? As it turns out, this simple question has a simple answer: not very.

To understand why, consider two extreme scenarios. First, consider a small, open economy under financial autarky, with no intertemporal trade. Alternatively, think of the same economy as a financially integrated economy with perfect and frictionless capital mobility. The latter scenario, of course, involves potentially very large current account deficits. The welfare difference between the two scenarios should set an upper bound on the true welfare gains that can accrue to a country like Portugal or Greece; after all, neither country was in a state of financial autarky before adopting the euro, nor is either currently experiencing unfettered capital flows.

To measure this upper bound, one needs only some estimate of the current and steady-state levels of physical and human capital per capita. Such estimates are provided and discussed in work I have done with Olivier Jeanne.[1] Using these estimates, table 1 below reports compensating variation for twenty OECD countries as of 1995. Compensating variation measures the constant fraction of annual consumption that the typical household would have to give up to be indifferent between financial integration and financial autarky. For Greece this compensating variation is about 0.76 percent of annual consumption. The figure for Portugal is larger, at 2.67 percent. Those numbers are quite representative: compensating variation averages 0.91 percent of consumption for all countries in the sample, and it ranges from 0.10 percent for Norway to Portugal's 2.67 percent.

How should we think of these numbers? I would argue that they are quite small. First, they are upper bounds on the true welfare benefits, and they are likely to be considerably smaller after adjustment costs, incentives, and intertemporal terms-of-trade effects are factored in. Second, even when taken at face value, they are small compared with the welfare benefits from, for instance, productivity improvements or the elimination

1. Gourinchas and Jeanne (2002).

Table 1. Compensating Variation in Selected OECD Countries, 1995

Percent of consumption

Country	*Compensating variation*[a]
Australia	0.58
Austria	0.62
Belgium	0.74
Canada	0.96
Denmark	0.69
Finland	0.47
France	0.84
Greece	0.76
Ireland	1.11
Italy	1.61
Japan	0.46
Netherlands	0.74
New Zealand	0.21
Norway	0.10
Portugal	2.67
Spain	2.44
Sweden	0.72
Switzerland	0.37
United Kingdom	1.08
United States	1.20

Source: Author's calculations from data in Gourinchas and Jeanne (2002).

a. Share of annual consumption that the typical household would have to forgo in order to be indifferent between full financial integration and full financial autarky.

of domestic distortions.[2] These small numbers reflect the fact that, taken alone, financial integration is unlikely to remove domestic distortions or inefficiencies. This result weakens Blanchard and Giavazzi's claim: if this is all that is going on, we should not worry about large current account deficits because they do not matter much for welfare, just as it does not matter much for welfare whether the capital account is open or closed.

DOMESTIC EFFICIENCY GAINS IN PORTUGAL AND GREECE. Of course, conditional convergence is not the whole story. EU members exhibit convergence in income per capita. Equivalently, we observe a productivity catch-up. A simple look at labor productivity and TFP over the second half of the 1990s confirms that productivity growth is an important part of the story. Table 2 reports labor productivity for 1991–95 and 1996–2000

2. See Gourinchas and Jeanne (2002) for specific examples and numbers.

Table 2. Growth in Labor Productivity and Total Factor Productivity in Selected OECD Countries, 1990–2000[a]

Percent a year

Country	Labor productivity		Total factor productivity,
	1991–95	*1996–2000*	*1990–95*
Ireland	2.7	4.0	5.4
Portugal	2.3	3.5	2.3
Greece	0.7	3.0	1.5
Finland	3.2	2.7	–0.3
Sweden	2.8	2.2	n.a.
Austria	1.9	2.1	2.0
United States	1.3	2.1	0.2
Belgium	1.6	1.7	1.0
Denmark	2.2	1.5	6.8
Japan	0.6	1.5	0.4
United Kingdom	2.7	1.5	1.1
France	1.2	1.3	0.9
Netherlands	1.0	1.1	1.7
Italy	1.8	0.9	0.6
Spain	2.0	0.9	1.8

Source: Author's calculations from data in *European Economy*, 2002, and Gourinchas and Jeanne (2002).
a. Countries are listed in descending order of 1996–2000 labor productivity. Data are simple annual averages.

as well as TFP for 1990–95. There is clear evidence that both Portugal and Greece experienced strong labor productivity growth (at least 3 percent a year) between 1996 and 2000. When one compares 1991–95 with 1996–2000, it is also clear that Portugal and Greece (and Ireland) did break away from the pack. TFP also rose sharply in Ireland and Portugal, but less sharply in Greece.[3]

More systematic analysis finds strong evidence that productivity growth in OECD countries is linked—negatively—to the initial level of development. Regressing TFP growth from 1965 to 1995 on the initial level of output per capita, I obtain the following results:

$$\begin{aligned} &OECD \\ &\Delta \ln A_i \quad = 7.36 - 0.71 \ln (Y/L)_i + \varepsilon_i \\ &\qquad\quad (1.62)\ (0.17) \\ &\text{Adjusted } R^2 = 0.47,\ n = 20 \end{aligned}$$

3. Unfortunately, more recent numbers are not available on a consistent basis across countries.

Non-OECD

$$\Delta \ln A_i = 0.92 - 0.09 \ln (Y/L)_i + \varepsilon_i$$
$$(1.31) \quad (0.15)$$

Adjusted $R^2 = -0.01$, $n = 43$.

These results indicate that low initial levels of output per capita are associated with faster TFP growth among the OECD countries. No such pattern is present for the non-OECD countries. This evidence in favor of productivity gains reinforces the message of the paper: after all, if poorer countries are also catching up in terms of TFP, so much the better, and the associated current account deficits should be even less of a concern.

One is left wondering, however, where these productivity gains are coming from. The paper mentions increased goods market competition and market discipline. Yet the discussion of Portugal and Greece does not revisit the issue as extensively. So we are left wanting more: is it purely a financial story whereby access to the international bond market (Portugal) or financial disintermediation (Greece) improves the efficiency of the domestic financial sector? Does it have to do with increased competition in goods markets? or with the discipline effect? These are important—and difficult—questions to answer.

CURRENT ACCOUNT DEFICITS, CROSS-COUNTRY OUTPUT, AND CATCH-UP. Take as given that the euro area countries are converging in terms of the level of GDP per capita, as suggested by the previous evidence. According to the neoclassical growth model, the cross-sectional variance for the logarithm of output per capita at time t, σ^2_{yt}, should follow

$$\sigma^2_{yt} = e^{-2\beta}\sigma^2_{yt-1} + \sigma^2_{ut},$$

where σ^2_{ut} represents the variance of unexpected changes in preferences or production conditions across countries at time t, and β is the "speed of convergence" taken from the neoclassical growth model.[4] This σ-convergence expresses the idea that we should expect to see less and less dispersion in output per capita as countries converge to their common steady state. For present purposes, observe that any factor that speeds up convergence (that is, increases β) should also lead to a faster decline in the cross-country

4. See Barro and Sala-i-Martin (1992, p. 384). β is approximated by $(1 - \alpha)(g + n + \delta)$, where α is the capital share and g, n, and δ are, respectively, the common TFP growth rate, the population growth rate, and the depreciation rate.

dispersion of income. It is then a direct implication of the theory that financial and product market integration should lead simultaneously to an increasing dispersion, in the cross section, of the ratio of current account to GDP, and a decline in the dispersion of log output per capita.

Is this implication supported by the data? Figure 1 below reports the cross-country dispersion of log output per capita since 1975 for the OECD, the European Union, and the euro area, as defined in the paper. One can see a large decline in this measure of income inequality for all three groups, especially for the European Union and the euro area, where it has fallen from a peak of 0.32 in 1984 to a trough of 0.23 in 1997. At first glance, this massive reduction in income inequality appears consistent with the convergence hypothesis just described. Most of this decline can in fact be traced to the growth performance of only three countries: Ireland, Spain, and Portugal.

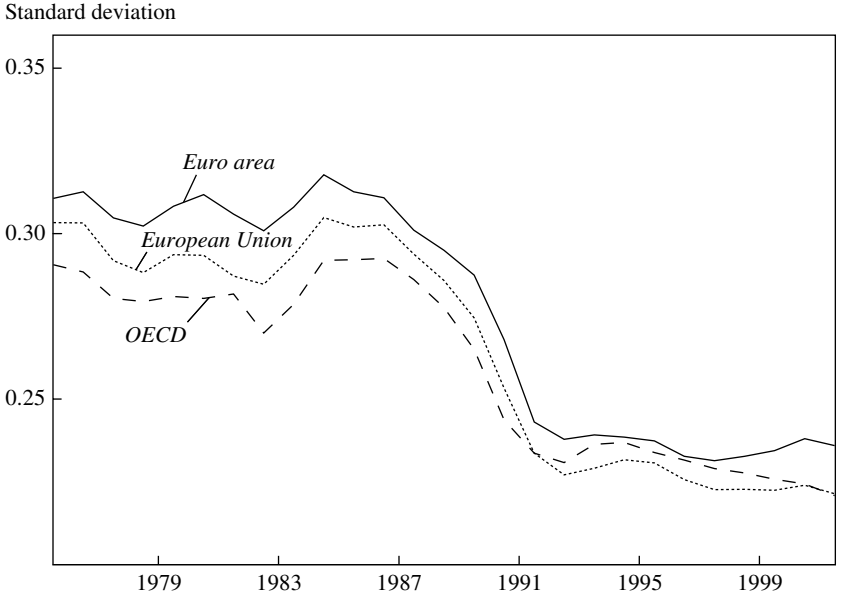
However, when we examine the joint evolution of output per capita and the ratio of the current account balance to GDP, the evidence appears less trenchant. Figure 2 is a scatterplot, for the euro area, of the cross-country dispersion in the ratio of the current account to GDP against income inequality. The figure shows three distinct phases. In the early 1980s the dispersion of current account balances was very large, reflecting the large budget deficits in Portugal and Ireland. From 1985 to roughly 1995 there was a massive reduction in income inequality, without any significant change in the dispersion of current account positions. Lastly, from 1996 to 2001 there was a large *increase* in current account dispersion, accompanied by a modest yet significant increase in income inequality.[5] This last segment is the focus of the paper. Yet the associated increase in income inequality contradicts the view that convergence is driving the process. A look at the time plot of log GDP per capita for the EU countries (figure 3) confirms that convergence seems to have stopped, except for Ireland, over the period when current account deficits were driven apart.

Of course, it is possible that country-specific shocks were sufficiently large to counteract the convergence process and drive incomes per capita apart over that period. However, one is left wondering what exactly these shocks were.[6]

5. The regression coefficient of the fitted line is 234.41, with a standard error of 69.78. The adjusted R^2 is 67 percent.

6. Figure 3 suggests that the answer is *not* that Germany's output per capita fell after reunification. One obtains the same results if Germany is excluded from the sample.

Figure 1. Cross-Country Standard Deviations of Output per Capita, 1975–2000[a]



Source: Author's calculations using data from Blanchard and Giavazzi, this volume.
a. In logarithms.

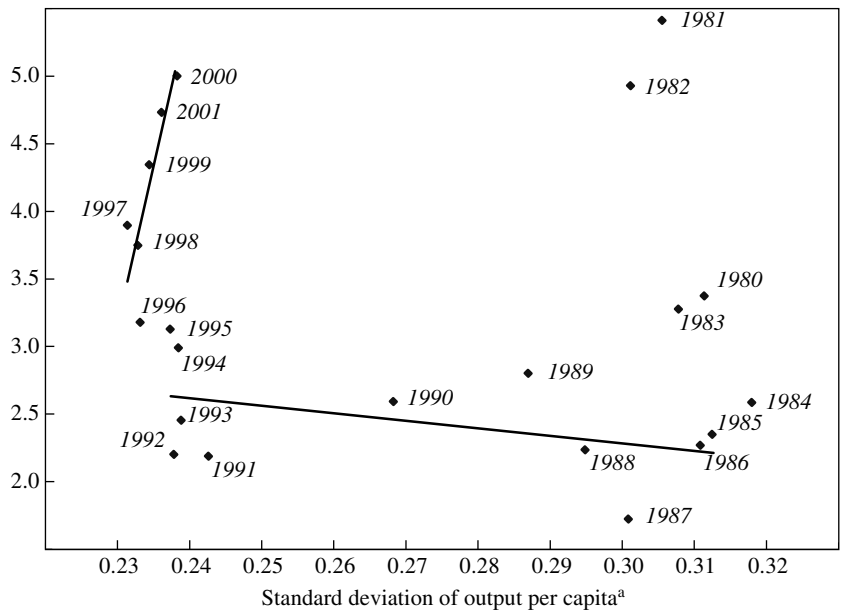
SHOULD WE WORRY? This slowdown or even reversal in convergence suggests that we should look at the components of the current account for further insight. Blanchard and Giavazzi state that "The channel [for the increased external deficit] appears to be primarily a decrease in saving—typically private saving . . . rather than an increase in investment."

According to the paper's table 1, private saving in Portugal decreased by 5.6 percent of GDP from 1985–91 to 2000–01. In Greece private saving decreased by 7.7 percent of GDP between 1981–91 and 2000–01 (table 2). By contrast, investment increased in Portugal by a modest 2.8 percent of GDP and remained more or less constant in Greece. In both countries public saving is not an essential part of the story.

The experience of these two countries—up to this point—is very reminiscent of that of many Latin American countries that have adopted exchange rate–based stabilization programs.[7] Stabilization of the

7. See Rebelo and Vegh (1995).

Figure 2. Cross-Country Standard Deviations of Current Account–GDP Ratios and of Growth in Output per Capita, Euro Area, 1980–2001

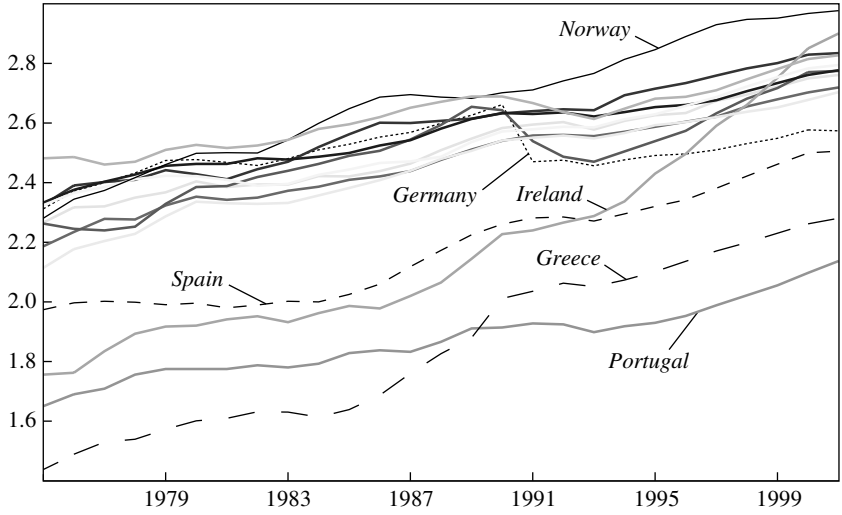


Source: Author's calculations using data from Blanchard and Giavazzi, this volume.
a. In logarithms; trend lines are for the periods 1985–95 and 1996–2001.

exchange rate, renewed access to international capital markets, and some euphoria at the prospect of steady future growth combined to generate a strong consumption boom—that is, a decline in saving—which may or may not have been accompanied by an investment boom. Growth was initially solid and everything looked benign. Over time, however, clouds gathered on the horizon: the currency appreciated in real terms, competitiveness plummeted, and foreign investors became worried as growth performance failed to meet expectations. The endgame is well known: with a fixed exchange rate, restoring competitiveness required an adjustment in relative prices. Often this was too little and too late. Eventually capital pulled out, forcing a devaluation.

European countries, too, have experienced similar dynamics in the past. For instance, France's experiment with "competitive disinflation" presents a number of similarities: a strong peg, a currency that appreci-

Figure 3. Output per Capita in the EU Countries, 1975–2001[a]



Source: Author's calculations using data from Blanchard and Giavazzi, this volume.
a. In logarithms.

ated over time relative to the deutsche mark, sustained external imbalances, a failure of wage and price moderation to restore competitiveness, and eventually an abrupt adjustment at the time of the 1992 crisis in the exchange rate mechanism.[8]

How do these episodes differ from the current situation in Portugal and Greece, and what lessons do they offer? I see two important differences. First, the Latin American countries in the early 1990s and the European countries in the late 1980s had a checkered inflation record. As a consequence, the real appreciation was relatively rapid. Inflation inertia was key to that process. Portugal and Greece today are in a different situation: there is virtually no risk that inflation will get out of control. Yet their strong economic performance, as well as the impact of convergence on the price of nontraded goods (the Balassa-Samuelson effect), implies that one can expect higher inflation in both countries than in the rest of the euro area. Annual consumer price inflation in September 2002 was

8. See Fitoussi and others (1993).

3.7 percent in Portugal and 3.4 percent in Greece, against only 2.1 percent for the euro area as a whole.[9]

Taken together, these considerations imply that real overvaluation may happen relatively slowly in Portugal and Greece. But there are signs that it is coming. In time, this will require an adjustment in relative prices, which may prove painful.

Second, to the extent that both countries belong to European monetary union, there is no escape clause: the risk of devaluation is also nonexistent. This means fewer reasons for financial markets to worry. Indeed, the fact that neither Portugal's nor Greece's debt carries substantial spreads over that of other European countries can be taken as a sign of market confidence in these countries' ability to honor their international obligations. But this does not mean that capital cannot or will not pull out. Even with a relatively evenly distributed maturity structure, markets could refuse to finance additional increases in debt. At current levels this would mean a sudden stop on the order of 5–7 percent of GDP, which would surely raise the specter of default. In other words, although a common currency may eliminate concerns that capital flight will force a devaluation, it does not ensure against situations of illiquidity.

What should governments do? Certainly, provision of full insurance is unwarranted. As the authors argue, this would completely eliminate the benefits of greater integration. But it seems that no insurance at all is not the answer either. This discussion teaches us that there is some, probably strictly positive level of insurance that governments should purchase: a buffer, in the form of a larger government surplus, would prove useful should markets become less confident.

General discussion: Christopher Sims argued that although European monetary union is indeed relaxing the current account constraints on individual member countries, it remains important to keep track of those countries' current accounts. Opening up capital markets in poor countries has often led initially to large inflows and later to financial problems as the inflows shift balance sheets, alter the nature of institutions, and ultimately create systemic problems. He suggested that the European monetary authorities ought to be looking carefully at balance sheets and financial institutions in countries such as Portugal. Sims did not consider

9. OECD (2002).

the parallels with the financially integrated U.S. states a reason for complacency. He observed that, in the early history of U.S. financial integration, some states defaulted on their sovereign external debt.

William Nordhaus found that the analysis of the euro area economies provided a useful test of the Feldstein-Horioka idea that the high correlation, observed in the past, between domestic saving and domestic investment reflected imperfect capital markets. William Brainard suggested that it was important to distinguish, on the one hand, the short-term effects on the capital account and investment arising from improved efficiency of international capital markets from, on the other, the way in which the improved capital markets affect the correlation between domestic shocks and capital inflows. He agreed with Willem Buiter that, in theory, the latter effects are nonmonotonic. With either complete autarky or perfect international diversification, a shock to earnings on domestic capital would have negligible effects on the capital account. With perfect diversification, foreigners would own almost all of a small country's domestic capital, and domestic savers would have almost all of their capital invested abroad. A domestic shock to the earnings of capital would have little effect on the capital account or even on domestic consumption. Between these two extremes the capital account serves as a partial buffer to domestic shocks. Brainard thought that the real world was far from having perfect capital markets, and that reducing the costs of moving capital across national boundaries would result in greater capital flows in response to shocks. He also reinforced the point, originally made by Jeffrey Sachs, that the Feldstein-Horioka "puzzle" could appear even with a high degree of capital mobility. For example, a transitory shock affecting both domestic income and the marginal product of capital would affect both domestic saving and domestic investment.

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