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Article

The Weakness of the Euro: Is it Really a Mystery?

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THE WEAKNESS OF THE EURO: IS IT REALLY A MYSTERY?

1. A Review of the Main Facts and Issues

The external value of the euro declined steadily against the dollar and the yen between its launch and November 2000. After that, it experienced two cycles of limited appreciation followed by depreciation, hovering around a rate of .89 euros per dollar, and slightly below 110 yen (see Figure 2.1).

Figure 2.1

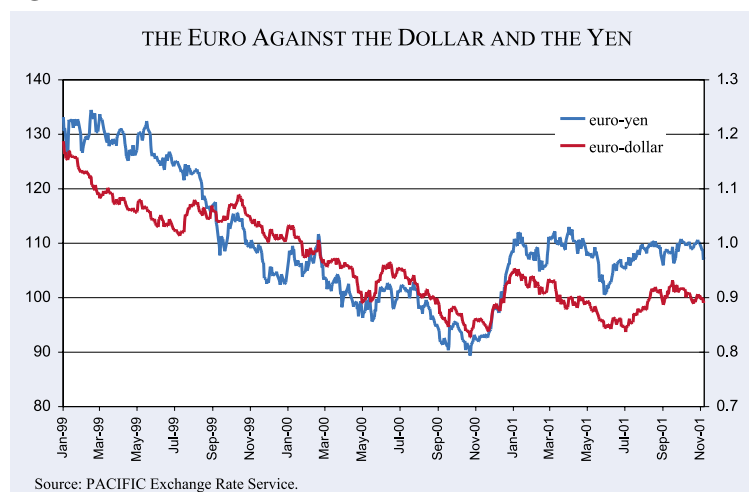
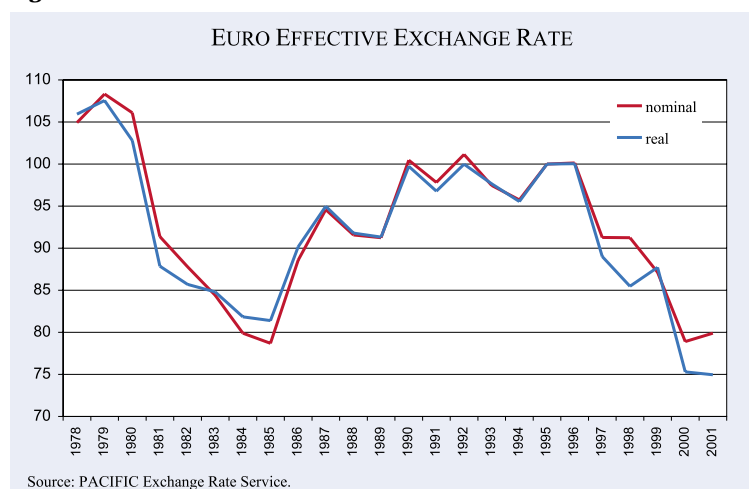


Figure 2.2



re 2.1). If measured in effective terms against an index of currencies of major trading partners (according to IMF calculations), the euro depreciated in real and nominal terms roughly by 17 per cent between January 1999 and the end of the year 2000. It has gained slightly since then (see Figure 2.2).

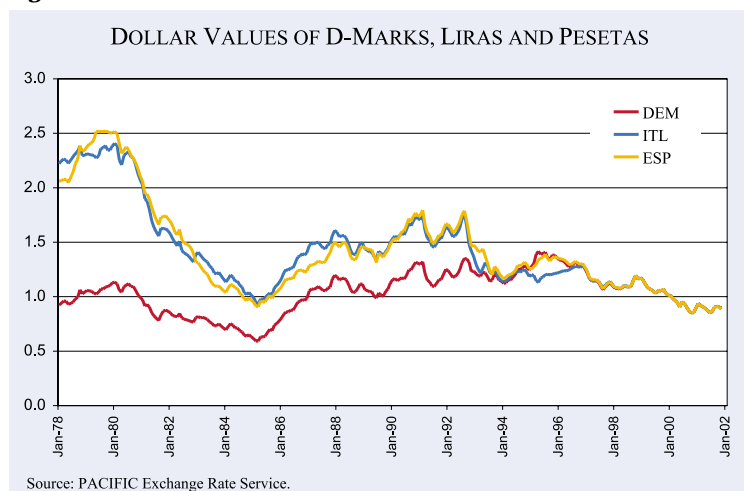
Looking back in time, we note that most European currencies started to depreciate against the dollar as early as 1995. As shown in Figure 2.2, the depreciation of the euro can be seen as the continuation of a phase of dollar strength starting three years earlier. Relative to the synthetic euro – calculated

as a weighted average of the European currencies in the euro basket – the dollar appreciated by 35 per cent between 1995 and 2000.

In effective terms, the value of the euro in November 2001 is about the same as in 1985, corresponding to the peak of dollar strength during the Reagan years, and to an historical low for European currencies. Individual currencies in the euro basket, however, experienced different developments. Figure 2.3 shows that the deutschmark was actually much weaker in 1985 than in 2000 and 2001 (as implicit in the euro). Translated into euros, the peak of the dollar relative to the deutschmark during the year 1995 would correspond to a price of only 56 US cents per euro. Conversely, liras and pesetas have never been weaker than in 2000 and 2001.

The balance of payments data for the Euro area show that the current account moved from a

Figure 2.3



modest surplus in 1998 to a modest deficit in 2000, and that the outflows of FDI and portfolio investment over the period were quite strong. The US experience over the same years was the opposite. A large current account deficit has been matched by large capital inflows.

As is well known, the euro was widely expected to appreciate after its launch in 1999, in anticipation of stronger European growth and the successful completion of European Monetary Union. Its steady depreciation took most observers by surprise. Over time, the “mystery” of a steadily falling currency has raised a number of issues. Is the euro out of line relative to the fundamentals of the European economy? Should we expect a rebound? If yes, when? Most importantly, is a weak euro somehow damaging the European economy, so as to call for some policy action to support its value? For instance, has a weak euro constrained the ability and willingness of the European Central Bank to pursue stabilisation policies by reducing interest rates? Should major central banks of the world cooperate to contain the size of exchange rate swings?

In this chapter of the report we will argue that, while no single interpretation can perfectly fit the historical behaviour of the Euro, a few factors stressed by economic theory, individually and collectively, can help us to understand why the European currency was relatively weak in the past three years. Different forces are at work, both through a portfolio channel and through a macroeconomic adjustment channel, to keep the euro, at least temporarily, low.

On the portfolio side of our interpretation, the weakness of the euro is mostly driven by excess supply of euro-denominated assets. Most analysts have focused on the *demand* for foreign-currency denominated assets by Euro area residents, motivated in part by the expectations of high productivity growth in the United States, in part by the search for diversification opportunities after the common currency eliminated currency risk within Euroland. Recent analyses have instead stressed the strong increase in

the issuance of euro-denominated bonds after 1999, and, most importantly, the strong contraction in the demand for currency in circulation in view of the impending changeover. This contraction resulted in part from reduced interest in the deutschmark as an international transactions currency, notably in eastern Europe, Turkey and Asia, in part it was caused by the flight of black monies from inside the euro area into real assets and non-EU currencies. Replacing a substantial fraction of the currency in circulation with short-term securities which are part of the broad money aggregate M3, the ECB was able to partly stabilise the interest rates, but to a much lesser extent it succeeded in stabilising the exchange rate. The additional short-term assets found their way into the international portfolios of financial institutions only at a reduced value of the euro.

On the macroeconomic side of our interpretation, the weakness of the euro to a large extent mirrors the strength of the US economy. In the second half of the 1990s, the dollar appreciated by about 20 per cent in real terms, while the United States widened its current account deficit to 5 per cent of GDP. The perspective of future productivity growth in the United States kept consumption and investment demand quite high through most of 2000. By the end of 2000, uncertainty surrounding the growth and productivity differentials between the United States and Europe picked up, leading market participants and international institutions to wonder about the sustainability of the US external balance. Opinions have been quite polarised: Some believe that the United States may well keep their lead in productivity and growth for many years to come; others have become more sceptical. Many

recent market movements seem to reflect swings in expectations across these two scenarios. The main question is whether the adjustment, when it comes, will take the form of a soft, as opposed to a hard landing, in terms of depreciation of the dollar and current account reversal. In their paper presented at Jackson Hole, for instance, Obstfeld and Rogoff (2000) argue that closing the US current account deficit in a gradual way (the soft-landing scenario) would entail a real depreciation of the dollar by about 16 per cent, roughly corresponding to a nominal depreciation of 12 per cent. Their hard-landing scenario looks quite different, with a one year fall in the dollar of about 24 per cent in nominal terms.

To rule out any misunderstandings, before presenting our argument we stress that economic research strongly warns against the ambition to “explain” exchange rates. It is well known that no economic model does well in explaining, let alone forecasting, exchange rates in the short and medium run. As shown by Meese and Rogoff in 1983, and many studies after that, a simple random walk model systematically outperforms the predictions of sophisticated econometric models over many quarters. This is, of course, no surprise, since the exchange rate is an asset price – nobody can claim success in explaining, say, the stock market! However, this is not to say that economics cannot provide some guidance as to the influences on the external value of the euro, especially in the longer run. Keeping our ambitions in check, this is one of the goals of this section of the report.

While the link between the euro and the economic fundamentals of Europe is the subject of an intense debate in both theory and policy, almost 30 years of floating exchange rates across major currencies have taught us an important lesson: stabilising the inflation rate does not mechanically imply a stable exchange rate. Large swings in the euro are not necessarily incompatible with the achievement of price stability objectives and should not be mechanically taken as an indicator of how well a central bank is doing its job.

2. Financial Factors and Portfolio Movements at the Root of the Euro Weakness

Studies of the euro often refer to the portfolio balance approach to the exchange rate. According to the argument in these studies, an increase in the

relative supply of euro-denominated assets (or a fall in their demand) should lower their price relative to foreign assets – thus increasing their yield in domestic currency and depreciating the euro.

The problem with adopting this approach in policy and empirical analysis is that asset supply and demand affect asset prices and exchange rates in quite complicated ways. In a world with many assets, for instance, a shock to demand or supply of a specific asset alters the return on and therefore the demand for all assets in a way that depends on investors’ wealth and their attitude towards risk. The effect on the exchange rate cannot be predicted in general, but only conditionally on specific features of the economy. Moreover, this effect will also depend crucially on what the issuer of the assets will do with the additional financial resources: whether she/he will invest, consume or reduce debt.

Nonetheless, there are a few cases in which the prediction of portfolio models becomes more precise. Suppose there is an increase in the supply of European currency and short-term securities which is balanced in a way that does not affect the short-term interest rate (or suppose an unbalanced increase in the supply accommodated by an expansionary open-market policy so as to stabilise the interest rate.) Reasonably, to absorb a larger supply of assets, international investors will require a fall in their price or, equivalently, an increase in their rate of return. However, since the own-currency nominal rate of return is given in the case under consideration, a change in the price of euro-denominated assets in foreign currency is required, and this can only be achieved via a fall of the exchange rate of the euro.

This argument provides the conceptual foundation for sterilised interventions in the foreign exchange markets. To prop up the euro without affecting euro interest rates, the European Central Bank buys euro-denominated securities and money balances in exchange for foreign-currency denominated securities and money balances, changing the relative supply of these assets in the hands of private investors. To make room for more foreign-currency denominated assets, these investors will require a fall in their price which can be achieved by a fall in the dollar or, equivalently, a rise in the euro.

There is some controversy on the empirical magnitude of these portfolio effects. Many are sceptical

and downplay their importance altogether (see for example Obstfeld and Rogoff (1996)). Yet, a different and more favourable view is suggested by recent studies of the foreign exchange market. Evans and Lyons (1999 and 2000) show that each billion of additional sterilised stock demand for money (due to private buy orders) has an immediate effect on the dollar exchange rate of 44 cents. About 80 per cent of this effect is persistent over time – persistence is even higher when the buy orders arrive in periods when trading activity is high. This means that a mere \$50 billion excess supply of dollars could appreciate the euro by 22 cents on impact, and 17 cents permanently!

So, can the euro weakness be attributed to portfolio-balance effects? We address this question by discussing two pieces of evidence: the increase in the issuance of euro-denominated debt; and the contraction in the demand for currency in circulation, especially for deutschmarks, after the launch of monetary union and in view of the 2001 changeover.

3. Can a Large Issuance of Euro-denominated Assets Affect the Exchange Rate?

One of the most striking facts in the short life of the euro is the sharp increase in the issuance of euro-denominated debt relative to the cumulative issuance in European currencies up to 1999. In the international debt market, the percentage of new issues of euro-denominated debt securities has increased from 25–30 per cent before 1999, to 40–45 per cent after the launch of the new currency.

According to the BIS, in the first and second quarters of 2001, the *gross* issuance of euro-denominated bonds and notes was as high as \$408.5 billion out of a total of \$1,113.5 billion announced new issues. Relative to the net issuance of international debt securities in dollars, *net* issuance in euros was higher in 1999, came down to three quarters in the year 2000, but bounced back in the first two quarters of 2001.

There are a number of factors that underlie this phenomenon, including a wave of mergers and acquisitions that have vastly increased the financial need of European corporations, the desire by some foreign firms to establish a presence in the market of euro-denominated debt, low interest rates (relative to historical standards), but also the creation

of a deeper and more liquid market for bonds. While some of these factors may be temporary, this evidence does point to a significant development towards a pan-European bond market – reflecting current changes in the pattern of European corporate finance.

The IMF recently stressed the argument (early-on discussed by McCauley), according to which the euro weakness can in part be attributed to the extraordinary increase in the net supply of euro-denominated bonds. Meredith (2001) calculates that, holding the exchange rate constant (that is, disregarding the depreciation of the euro) the supply of euro-denominated debt increased by €300 billion between 1998 and the first quarter of 2001. There are, however, a number of problems with this interpretation.

First, is the €300-billion increase in net issuance of Euro-denominated debt to be considered a net addition to the world asset supply? Some fraction of new euro debt may well be a substitute for euro-denominated loans by banks. Adjusting for asset substitution should considerably lower the size of Meredith's estimate.

Second, and more importantly, even if the adjusted estimates remain high, the impact on the euro will probably depend on the maturity of the new debt and the reasons for the new issuance. As monetary and fiscal authorities do not strictly target long-term interest rates, new issuance of long-term debt instruments reduces their price in domestic currency, increasing their yield. This drop in domestic debt prices may be sufficient to make international portfolio investors willing to absorb the new issuance with little or no adjustment in exchange rates. Things are quite different for new debt belonging to the shorter end of the spectrum, since short-term interest rates are more closely controlled by central banks. In this case, the ECB would react to a drop in debt prices or an increase in interest rates with an expansionary open-market policy, i.e. with a purchase of short-term debt against currency. But we have little evidence that this is what has actually happened in the European debt market. As we will point out in the subsequent section, the relative stock of currency in circulation has not increased, but rather declined in recent years; in fact, it even declined in absolute terms, an unusual phenomenon which points to another explanation.

4. The Sizeable Fall in the Demand for Currency in Circulation

The demise of national currencies and the euro changeover in 2001 have had a profound effect on the demand for currency in circulation. The ECB data show that the stock of euro-11 currency in circulation had grown more slowly than the broad money aggregate since 1997 and contracted sharply in absolute terms during the year 2001. Figure 2.4 plots the seasonally adjusted increments to the stock of currency in circulation against the number of months to the changeover. The data for 2001 are quite striking, but there is evidence that important changes had already occurred early-on in the life of the European Monetary Union. Why did the euro reduce the demand for cash? Is this effect temporary? Sinn and Westermann (2001a and b) recently addressed these issues, showing that there are several factors at work.

The introduction of the euro affected the demand for that European currency with a large circulation outside Europe, which is the deutschmark. According to the Bundesbank, in 1995 approximately 1 in 3 deutschmarks circulated outside the country. The money was used especially in East and Southeast Europe and in Turkey, but also in east Asian countries and elsewhere in the world. The deutschmark was the second largest transactions currency after the dollar, of which as much as 70 per cent might be circulating outside the United States. Taking the Bundesbank estimate as a benchmark, the aggregate circulation of deutschmarks in foreign countries can be estimated to have been as high as €46 billion.

This international circulation of the deutschmark may be partly attributed to 'currency substitution' – as people may have lacked confidence in the domestic currencies issued by the new states emerging from the dissolution of the Soviet empire. But it also reflects portfolio diversification in economies with limited financial development and a large informal economy. The deutschmark thus represented both a means of payment and a liquid asset with a stable value.

Things changed in the last few years. To some extent, the process of political consolidation in most of these states has realistically increased their citizens' confidence in their domestic currency, reducing the need and scope for currency substitu-

tion. Most importantly, the creation of the euro generated uncertainty around the deutschmark, perhaps as early as 1996, when the Dublin summit eliminated the last doubts about the creation of the euro, and therefore about the demise of the German currency. As discussed by Sinn and Westermann (2001a), these circumstances clearly contributed to reduce the international demand for deutschmarks. A first issue is the apparent asymmetry in international confidence between one currency with a long track record of stability and a new currency based on an unprecedented political agreement among sovereign nation states. A second issue is the widespread uncertainty (especially outside the EU) about the modalities and costs of converting deutschmarks into euros during the changeover in 2002. People may have been afraid of being cheated given their lack of familiarity with the new euro bills (how can anyone tell the difference between a good euro bill and a counterfeited one at the time of the changeover?). Also, some may have disliked the idea of changing vast sums of money into euros within a relatively short period of time – since this means that they have to deal with rules against money laundering (presumably stricter during the changeover period than otherwise), and/or to expose their liquid savings to the risk of theft.

A majority of economic experts on Eastern Europe surveyed by the Ifo Institute at the beginning of 2001 argued that foreigners had not been properly informed about the euro and felt substantial insecurity. Some governments in the area even took official steps to discourage deutschmark holdings by their citizens. The Polish government, for instance, warned against holding deutschmarks and recommended exchanging them into zlotys. As a result, however, many people may have preferred to acquire dollars instead of zlotys. In addition, secret services reported massive exchange transactions from the deutschmark into the dollar in Yugoslavia.

An extensive survey by the Austrian central bank in Croatia, Hungary, Slovenia, the Czech Republic and Slovakia documented a strong propensity to move away from deutschmarks into dollars and other currencies (Stix 2001). From the second half of 1998 until the first six months of 2001, the decline in foreign demand for deutschmarks was strong enough to fully explain the reduction of the stock of deutschmarks in circulation. As late as

May 2001, most holders of deutschmarks in eastern Europe had not decided in which currency to exchange them, and among those who had made up their minds, no less than 40 per cent said that they did not want to exchange them into euros, but rather into other currencies.

Not surprisingly, the share of deutschmarks in the euro-11 money supply declined sharply after 1997. From January 1997 to October 2001, the decline in this share was 5.7 percentage points, large enough to explain a reduction in the stock of deutschmarks in the order of €21 billion. Interestingly, the recent decline in the share of deutschmarks mirrors the sharp increase in the deutschmark share after 1989 associated with the fall of the Berlin wall. Eastern European citizens moved into deutschmarks in the first few years of their new life in market economies. The introduction of the euro somehow redirected their demand towards other currencies. Liras, schillings and Finnish markkas, also held in Eastern Europe, may have experienced a similar fate.

It is now well understood that the euro changeover – and its strict rules against money laundering – is of concern to criminals and tax evaders, who hold large sums of money in cash. Their problem is to choose the most effective way to reduce the costs of dodging the rules as well as the risk of being caught when recycling cash. Plausibly, acquiring dollars, pounds Sterling or Swiss francs slowly over time may have been preferable to waiting for the changeover period and converting all their cash in a relatively short time span. Indeed, many observers believe that criminal organisations

moved massively into dollars. In the last few months before the changeover an anticipation of this and related phenomena were observable. Newspapers increasingly reported stories about booming sales of real estate and luxury goods settled in cash. Schneider and Ernste (2000) indirectly provide an estimate of a lower bound on cash held in the black market economy of as much as €50 billion.

The reduced demand for euro-11 currencies resulting from these effects is likely to have depressed the value of the euro despite ECB interventions to stabilise the short-term interest rate. If the ECB did not have an interest-rate target but an exclusive focus on narrow money targets, the reduced demand for Euro-area currencies would have caused a fall in European interest rates in order to induce Europeans to keep holding the existing stock of euro-11 currencies in their portfolios. We would not have seen any contraction in the stocks of currency in circulation, such as the one shown in the above figure. Then, because of the decline in interest rates and the reduced attractiveness of euro-denominated bonds, the euro would have experienced an even sharper decline in its external value!

However, the ECB does have an interest target, and does not focus on narrow money aggregates. More or less automatically, the ECB bought back unwanted money balances against short-term securities from its own portfolio in order to keep the short-term interest rate at its target level. But this policy only mitigated, not avoided, the negative effect of a contraction in money demand on

the euro. This is because, by substituting short-term interest bearing securities for currency, it did not reduce the overall stock of *short-term* assets, as measured by the M3 aggregate. As shown in Figure 2.5, the time path of M3 has been largely unaffected by the contraction in the demand for cash and a similar development is true for other aggregates such as M1 or M2. In other words, interest-rate targeting resulted in a switch from currency to other assets at unchanged values of other

Figure 2.4

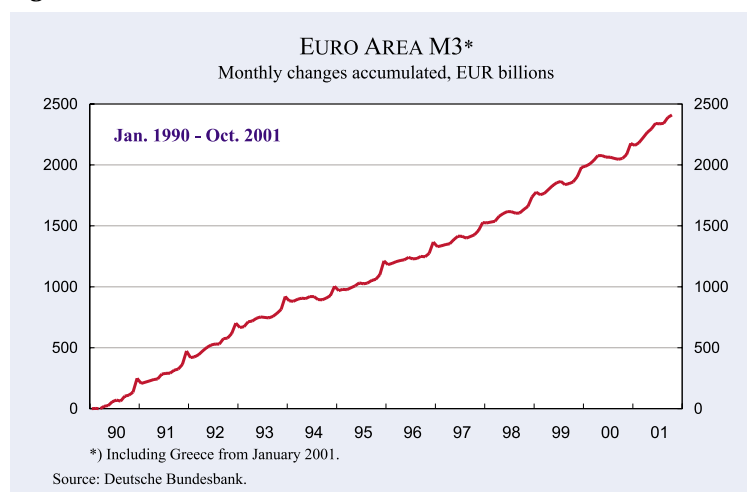
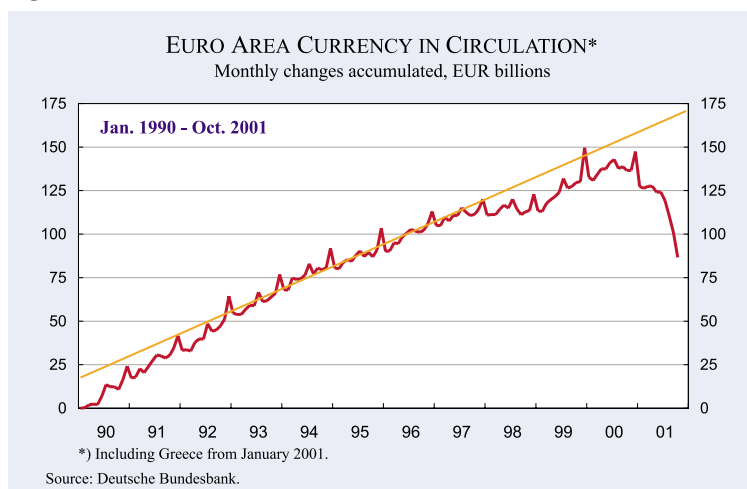


Figure 2.5



money aggregates, rather than a reduction of these aggregates themselves. Given that the other money aggregates was not reduced by the falling demand for Euro-area currencies, the net effect on the euro could not but remain negative. After all, the reduction in the demand for short-term euro denominated assets has not been accommodated by a reduction in the supply of such assets.

The explanation implies a positive correlation between the exchange rate and a country's currency in circulation when the central bank follows a policy of interest-rate targeting. Such a correlation was found to be robust for the deutschmark-dollar exchange rate during the nineties as well as for other exchange rates and time periods (see Sinn and Westermann 2001a and Breedon and Fornasari 2001).

Note that this explanation does not require households and firms trying to get rid of the old Euro-11 currencies to go straight into the dollar. In many cases the substitution may have been from cash to real assets such as land or art objects or to other currencies, including the domestic currencies of the East European countries. However, for a given stock of such assets, those who sold them may then have bought dollar-denominated assets instead. While the substitution chains may have been complicated and hard to track in detail, it is very unlikely that the reduced demand for Euro-11 currencies, which in itself is a clearly documented fact, did not increase the demand for dollar-denominated assets, with a sizeable effect on the relative value of the currencies.

What is the magnitude of the combined effect on money demand and exchange rates of all the factors discussed above, including both the reduction in circulation of European currencies outside Euroland and the contraction of money held by the black economy? Focusing on Germany, Sinn and Westermann fit a traditional money demand equation (with interest rates, GDP and time as explanatory variables), and looked at the size of the regression residuals in the last few years. While demand for

deutschmark is one standard deviation above trend in the period 1994–1996, it falls one standard deviation below trend in 1999, and two standard deviations below trend in the year 2000. The sharp decline in deutschmark holdings between the first quarter of 1997 and the last quarter of 2000 corresponds to an absolute decrease in the demand for deutschmarks in the amount of €27 billion.

It is, of course, very difficult to generalise this finding to the Euro area as a whole, since the circulation of other European currencies outside the country in which they are legal tender is not as large as for the deutschmark. On the other hand, the size of the black economy may be large in many countries. Some realistic calculations by Sinn and Westermann (2001 b) suggest that over the period 1997–2000 the demand for European currency has fallen €48 billion below a trend determined by GDP, interest rates and time. We may expect this estimate to be quite conservative when extrapolated to 2001 and the early months of 2002. Indeed, from January to October 2001, the decline in the stock of currency in circulation was again very substantial, being in the order of another €50 billion (Sinn 2001). Inspection of Figure 2.4 shows that the gap between a simple linear trend and the currency in circulation had reached a level of about €90 billion in October 2001 with an obviously sharp tendency to increase further in the remaining months of the year.

Relative to the increase in the supply of euro-denominated debt by €300 billion at constant exchange rates a €90 billion drop in the demand

for currency in circulation may not seem large. Yet, as already mentioned at the beginning of this chapter, in light of the findings of Evans and Lyons, the exchange rate effect of such a drop in demand can be quite sizeable. As each additional billion in sterilised demand for dollars raises the exchange rate between 35 and 44 cents, this factor can explain a depreciation of the euro against the dollar by between 30 and 40 cents if the drop in demand for Euro-area currencies translates fully into an increase in the demand for dollars. This is enough to explain the actual decline in the foreign exchange value of the Euro-area currencies since 1997, which was about 40 cents.

That a €90 billion reduction in currency demand would have a large effect on the euro is also consistent with the recommendations of advocates of sterilised intervention. Lyons and Portes (2000) and Portes (2001), for instance, argue strongly for sterilised foreign exchange interventions in the order of €50 billion.

As is well known, the ECB intervened in support of the euro on two occasions: the first was on 22nd September 2000, the second one on 3rd through 6th November of the same year. In the first intervention, the ECB was joined by the United States, Japan, Canada and the UK, while it acted unilaterally in November. Although the size of these interventions has been kept secret, reportedly the first intervention was between €2 and 12 billion. On that occasion, the euro jumped from \$.85 to \$.90 within hours, and subsequently came down to \$.88 for a week. The second intervention had a much weaker impact, but it was implemented in less than ideal conditions (see Koen et al. (2001) for a discussion).

5. The Euro and Macroeconomic Adjustment

A complementary explanation of euro weakness shifts the focus from the role of the exchange rate in the asset markets, to its role in the good markets, stressing the dynamics of aggregate demand in the United States relative to the Euro area. In this interpretation, the weakness of the euro is a mirror of dollar strength along with the long phase of US expansion in the 1990s – characterised by high investment rates, low inflation, a large fall in the natural rate of unemployment, a growing current account deficit, and sustained productivity growth.

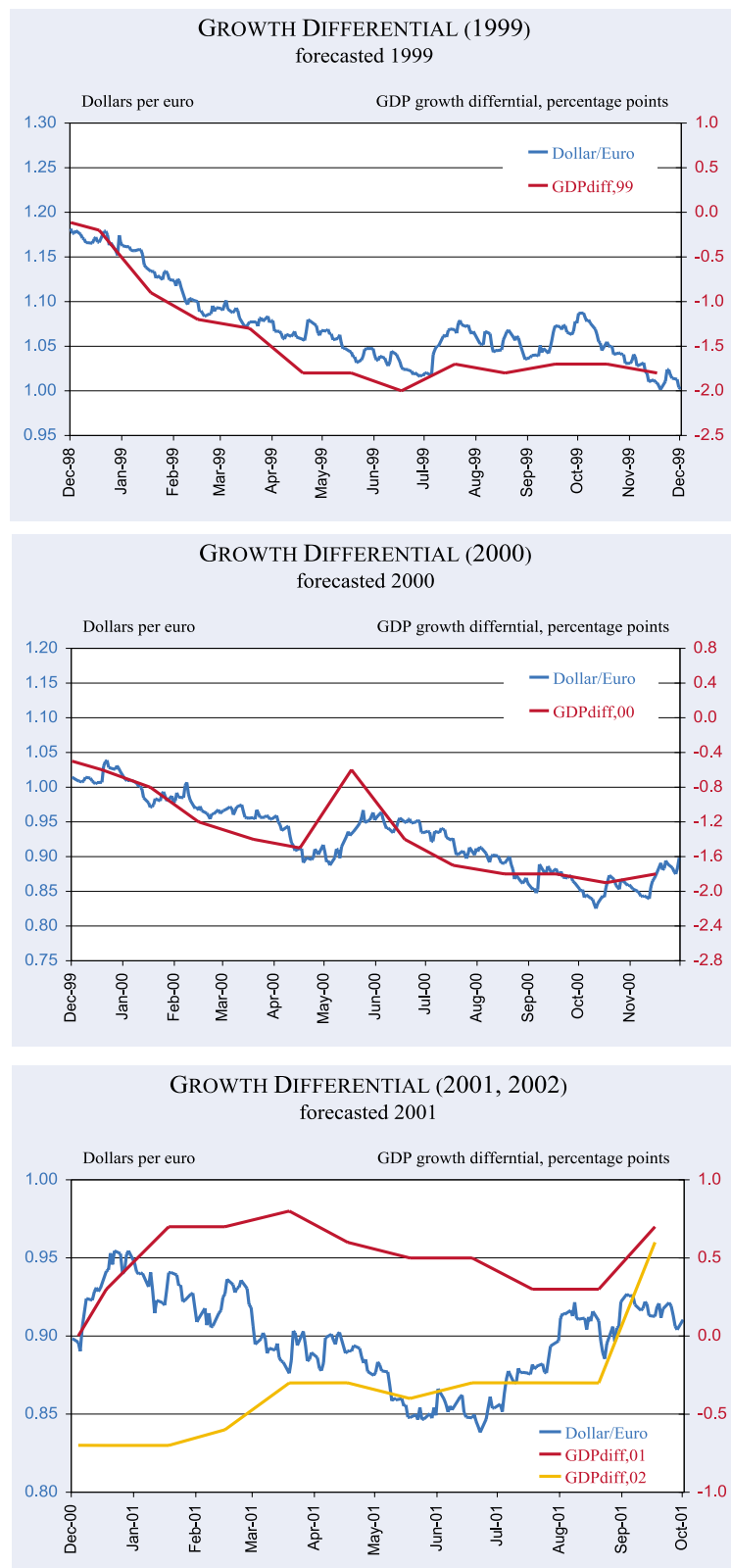
The argument draws on a well-known prediction of standard open-economy models with nominal rigidities: any shock that leads to excess domestic aggregate demand and overheating in the short run also creates a trade deficit, causes the real interest rate to rise, and leads to a real appreciation of the currency. Since the economy is overheating, high interest rates and the real appreciation endogenously reduce the internal demand imbalance. In particular, real appreciation discourages foreign demand for domestic output by raising its relative price in the world market. Together with high interest rates it also makes current (as opposed to future) consumption by domestic citizens more expensive.

This standard model seems to fit well the recent US experience. The key factor driving the long phase of demand growth in the second half of the 1990s is commonly identified with expectations of persistent productivity gains, raising forecasts of future income growth. As persistent productivity gains imply higher profits, these expectations led to an investment boom, adding to the productive capacity of the country. Anticipated income growth in turn caused households to adjust their estimated permanent income upwards and to modify their consumption plans accordingly. The combined effect of higher investment and consumption demand sustained GDP growth, but also widened the external imbalance: the US current account deficit widened from 1.5 per cent in 1995 to about 5 per cent of GDP in 2001. Financing this deficit was not a problem, as domestic returns were reflecting expected productivity gains (even with some irrational exuberance), attracting capital from the rest of the world. Leaning against the wind of excessive demand, domestic interest rates tended to rise relative to the rest of the world. Indeed, the differential between US and European long-term nominal interest rates turned from negative to positive after 1995, and remained positive until 2001. The dollar rose relentlessly between 1995 and the end of 2000.

Yet it is worth recalling that the novel features of recent US economic growth were not readily (and perhaps are still not very well) understood. As mentioned above, when the euro was launched most observers believed that the US economy was at the end of its expansionary phase, while Europe would soon catch up. The European currencies were actually experiencing an appreciation.

Figure 2.6

Forecast Euro Area – United States Growth Differential and the Dollar-Euro Exchange Rate



Note: This is an update version of the chart introduced in Giancarlo Corsetti and Paolo Pesenti, "Stability, Asymmetry, and Discontinuity: The Launch of European Monetary Union", *Brookings Papers on Economic Activity*, 1999:2, Figure 3, p. 352.

Source: Consensus Forecasts (Consensus Economics, London) and BIS.

Somewhat surprisingly, the data from the early months of 1999 depicted a totally different picture, and the euro started to lose value against the dollar. For many months afterwards, the dollar seemed to have tracked quite closely the market's re-assessment of US growth. At the same time, markets and EU institutions developed a deep scepticism about the possibility of 'new-economy' miracles in Euroland. For instance, the European Central Bank did not change its assessment of the long-term growth potential between 1998 and 2001, as implicit in the reference value for the rate of growth of M3.

Early in 1999, Corsetti and Pesenti (1999) pointed at the positive correlation between movements of the euro-dollar exchange rate, and revisions to prospective growth in the United States relative to Euroland, according to the "consensus forecasts" data. Figure 2.6 updates the analysis for the year 2000 and 2001. The association between the two variables is quite strong until 2000 and becomes looser afterwards, although it does not fade away – it is actually visible again at the end of 2001.

The graph shows that, from 1998 through the second quarter of 2000, the news on the US growth dynamics was all in one direction. After the summer of 2000, however, the previous pattern is no longer clear. Market moods seemed to swing between two possible scenarios, one extrapolating the relative strength of the US economy for another few years, the other pointing to a US slowdown,

with, a depreciation of the dollar and a reduction in the current account deficit. These 'polarised views' of the future are also contained in many official documents, such as the October 2001 World Economic Outlook of the International Monetary Fund.

Figure 2.6 is often confused with evidence supporting some 'cyclical view' of exchange rates – with appreciation and depreciation tracking different phases of economic cycles. Such view is misleading. Relative GDP growth forecasts are proposed as a *proxy* for expectations of future productivity and income trends, that are correlated with expected returns on US assets, and US households' permanent income, and therefore with US investment and consumption demand. With the United States working close to potential output, upward movements of internal demand may increase the need for compensating adjustments of external demand – that is the need for a real appreciation crowding out net exports. It is not surprising that detailed data on the balance of payments for the United States and Euroland showed that the euro-dollar exchange rate moved closely with net capital inflows into the United States. This correlation reflects exactly the same factor discussed above – strong beliefs in the persistence of growth and productivity gains in the US economy. These beliefs drove up US demand, generating the US external imbalance, and attracted capital from abroad. Most of these inflows were from Europe where, because of the impending introduction of the single currency, investors were searching for new opportunities to diversify their portfolios. The exchange rate, capital inflows and aggregate demand are all endogenous variables in the macroeconomic process – it makes little sense to state that one 'causes' the other. In this respect, we note that much of the increasing demand for US equities came from UK investors, with apparently little effect on the strength of the pound – a strength that is best understood by looking at the dynamics of British aggregate demand and output.

Some evidence in support of this interpretation of euro weakness is provided by the May 2001 World Economic Outlook of the International Monetary Fund, that includes a study of the determinants of the bilateral exchange rates for dollar-euro and dollar-yen in the period 1988–2000 (measured at a quarterly frequency). The study shows that over the period, the dollar-euro exchange rate is signif-

icantly correlated with net equity flows (more equity investment in the United States appreciates the dollar), and long-term interest differentials (higher US rates appreciate the dollar). It is also strongly correlated with relative expected growth rates. The statistical results are, however, different for the dollar-yen bilateral exchange rate. It seems to be correlated with long-term interest differentials, but not with net equity flows or differential growth prospects. This suggests that other factors, possibly related to causes of the long-lasting Japanese stagnation in the 1990s, are at work.

The importance of productivity differentials is strongly supported by Alquist and Chinn (2001b), based on an empirical study of the real euro-dollar exchange rate over the period 1985–2001. They find that each percentage point in the United States-Euro area productivity differential results in a five-percentage-point real appreciation of the dollar. The authors rightly observe that one cannot explain this result without stressing the role of expectations in driving domestic demand.

An interesting question concerns the kind of divergence in expectations of future productivity growth that is required to generate the observed real dollar appreciation. This question is addressed by Alvaro and Parera-i-Ximenez (2001) using a modern version of the Dornbusch-Mundell-Fleming model to focus on the short-run effects of a revision of long-term potential output. In their exercise, short-run supply is assumed to respond to demand shocks with a lag. Assigning realistic values to the parameters of the model, it turns out that to generate a 25 per cent real appreciation of the dollar only takes an upward revision of expected long-run output of between 10 and 12 per cent – a very reasonable estimate of the discounted output effects of the new economy.

Could it be possible that the dollar appreciation was driven by the dynamics of aggregate supply and productivity, rather than by aggregate demand? Some studies analysed the prediction of a standard Balassa-Samuelson model, assessing terms of trade and relative price effects of a supply boom driven by productivity growth. Tille, Stoffels and Gorbachev (2001) did not find much of an effect in the data. Their estimates suggest that the gap in productivity growth between the United States and Europe could explain at most 5 percentage points of the dollar appreciation in the second half of the 1990s.

Most importantly, we should note that, holding aggregate demand constant, a supply boom should be associated with an increase in net US exports. Indeed, those sectors of the US economy with the fastest productivity growth have not lost international market shares (many sectors have nonetheless suffered because of the strong dollar appreciation). Yet the US trade balance sharply deteriorated due to an upsurge of imports – as is usually the case in the presence of a boom in domestic demand.

Another key question is whether the expectations of high US productivity growth and returns reflect a rational assessment of fundamentals as opposed to some bubble or misperception, inducing investors and households to grossly underestimate risk. For instance, it has been observed that the euro-dollar exchange rate responds asymmetricaly to US and European news, as well as to bad and good news, suggesting a bias in the way markets perceive relative growth prospects.

In the spirit of the well-known work by Robert Shiller (2000) on irrational exuberance in the US stock market, Meredith (2001) develops a demand-boom interpretation of the dollar strength driven by a surge of asset prices, not necessarily linked to fundamentals. Asset prices drive up consumption through a wealth effect and investment through easy and cheap financing. Swings in asset prices determine the end of dollar strength.

Why, then, has the euro not appreciated with the drop in US stock prices and the slowdown in the US economy since the fall of 2000? The euro did not even recover after the terrorist attack on September 11 – widely regarded as a catalyst of expectations, leading to a sharper deterioration of the world economic outlook than would otherwise have been the case.

Perhaps analysts and market participants do not believe in the possibility that Europe will recover on its own independently of the United States – despite official forecasts that often support the opposite view. So, any bad news for the United States is translated into equally bad news for the European economy ahead of any data release.

US monetary policy has been rapidly and sharply relaxed since the beginning of 2001. Allowing for lags in its effect on the economy, its impact should

be felt by the end of 2001. The US programme of tax cuts and increased public spending should also provide additional demand. Many observers believe that the slowdown in the US economy was mostly due to excess investment in the past, causing a compensating sharp contraction of investment spending in 2000 and 2001. Given that inventories are currently rather low, US firms may soon start spending again. This is the positive side of the coin.

On the negative side of the coin, consumer confidence is still low, and the effect of monetary policy has been rather modest (mostly operating through construction and real estate). Also, many believe that US asset prices are still too high relative to their fundamental value. Many economists are concerned with the risk of a liquidity trap – exemplified by the recent Japanese experience. International demand is low because the recession in Japan, and a clear slowdown in Europe. .

6. What About the Future?

By their very nature, some of the portfolio effects analysed above may well be temporary. Without doubt, black markets and international criminal organisations may come back to the euro after the changeover – especially when a large part of their profits are generated within Euroland. The process of international portfolio diversification may lead to a shift in favour of the new currency. The demand for currency in circulation should pick up strongly with the introduction of euro notes and coins. It has been suggested that the changeover will actually produce a peak in the demand for cash in the early months of 2002 because of the short period of parallel circulation of the euro and national currencies. A key question is then whether the demand for currency in circulation will be larger or lower than in the pre-euro period. For one thing, the euro changeover can increase the use of demand deposits and electronic means of payment, that are promoted with the introduction of the new currency. For another, it is possible that some of the foreign holders of European cash who went into the dollar in order to avoid the subjective and objective risks of currency conversion will not return but stick to the dollar as their preferred transactions currency for a considerable period of time.

Nevertheless, the demand for euro-denominated bonds and bills can be expected to increase relative

to the supply after the currency conversion, implying an appreciation of the euro. The timing of such an effect is, however, uncertain. It is possible for portfolio adjustments to take several years.

What is less clear is the market assessment of future growth in Euroland relative to the United States. Since the end of 2000, forecasters' opinions have been quite polarised. Some observers believe that the end of US productivity and growth leadership close and that US adjustment will be dominated by the need to close the current account deficit. This, of course, will be the case, sooner or later. The question is when. The track record of the dollar clearly shows that there is no obvious answer.

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Appendix

Is the euro undervalued?

Many econometric studies have looked at the long-run performance of a synthetic or “virtual euro”, constructed as a weighted average of the European currencies in the euro basket since the 1970s. According to most of these studies, the euro (at least in its virtual form) performs quite normally in the long run. For instance, in the analysis by Chinn and Alquist (2001), the euro appreciates when an increase of domestic output relative to foreign output raises the demand for the currency, it depreciates when the European central banks cut interest rates and expand the relative money supply. The European-United States gap in the relative productivity of tradables and nontradables also influences the currency according to the Balassa Samuelson hypothesis (discussed in another chapter of this report). A 1% positive difference causes the currency to appreciate between .85% and 1.7%. Other studies stress the role of productivity differentials even more, suggesting that these are the main force driving long-run movements in real exchange rates (see for instance the recent ECB working paper by Maeso-Fernandez, Osbat and Schnatz (2001)).

In addition, however, the euro tends to depreciate with hikes in the price of oil. It is also found to respond to long-run interest rate differentials, to relative government spending, but not to the cumulated stock of net external debt.

All these results are quite reasonable. They confirm the Balassa-Samuelson view. While the oil price may be correlated with the dollar via the strength of the world and US business

cycle, such correlation also suggests that structural differences across areas matter. For instance, to the extent that the United States is less dependent on imports of oil than Europe, an increase in the oil price is a terms of trade (that is a relative price) shock that should appreciate the dollar. These terms of trade effects, however, are usually found to be small (see Hunt, Isard and Laxton (2001)). Specific structural features of the economy can also lead to differences in monetary policy. To the extent that the United States uses more energy in production relative to Europe, oil price shocks may affect prices there more than in Europe, thus trig-

Estimates of the equilibrium value of the euro

Study	Methodology	Equilibrium rate of under-/overvaluation for the reference period
Wren-Lewis and Driver (1998)	Equilibrium FEER Model	1.19–1.45 against the dollar
Borowki and Couharde (2000)	Equilibrium FEER Model	1.23–1.31 against the dollar
Alberola et al. (1999)	Internal/external balance model	1.26 against the dollar
Alberola et al. (2001)	Internal/external balance model	Undervaluation 12.4% against trading partners
Hansen and Roeger (2000)	Internal/external balance model	Undervation: 15%
Lorenzen and Thygesen (2000)	Internal/external balance model	Long run 1.2 Medium run 1.19 Short run 1.09 against the dollar
Chinn and Alquist (2001)	Monetary model (M1, GDP, interest differentials) and relative productivity growth	1.17–1.24 against the dollar
Duval (2001)	Natrex and Balassa/Samuelson	1.15 against the dollar
Clostermann and Schnatz (2000)	Real long-term yield spread, oil price, government spending, relative price of traded to non-traded goods	Short run 1.20 Medium run 1.13 against the dollar
Teiletche (2000)	Relative productivity, government spending, real long-term yield spread, M1, industrial production	1.09 against the dollar
OECD	GDP PPP	1.09 against the dollar
IMF (2000)	Saving-investment	Undervaluation 30%
Wyplosz (2000)	Mean reversion on real exchange rate	Undervaluation 10–20%
Koen et al.	Terms of trade, saving-investment	Undervaluation
Van Aarle et al. (2000)	Monetary model with nominal rigidities	Explains the depreciation of the euro in 1999–2000
Schulmeister	PPP for tradables	.87 against the dollar

Adapted from Koen et al. (2001).

gering a stronger anti-inflationary reaction by monetary and fiscal authorities, appreciating the dollar when oil prices are high.

It is commonly believed that exchange rates should react to short-term interest rates, and a monetary contraction should lead to appreciation. This is true for a given value of next period's exchange rate. Yet, that exchange rate is not given and depends itself on future short-term variables and the expected exchange rate a further period ahead. Thus, recursive considerations of asset holders imply that it is indeed the long-term variables that represent fundamentals and that matter in the end. Ultimately, the level of the exchange rate should be related to *long-term* inflation and growth rates, current and *anticipated* risk premia, and productivity shocks, at both aggregate and sectoral level. The dependence of the exchange rate on future policy, productivity and risk is quite intuitive, as the exchange rate is an asset price. Other things equal, an easy monetary stance and inflation in the future means a weak currency today. The short-run effect of monetary policy decisions depends on their impact on these long-run conditions, and if a short run contraction implies a long run expansion, then it may well result in a depreciation today.

As long as it does not compromise fiscal stability, relatively high public spending contributes to a strong currency by raising the relative price of domestic traded and nontraded goods. Conversely, a high level of external debt requires the country to have higher exports in the long run in order to pay its external interest bill. To the extent that a higher supply of domestic products on the world markets reduces their price, a high external debt contributes to a weakening of the currency. This effect is, however, controversial when looking at the euro – as the high and rising external US debt should weaken the dollar, but so far has not done so.

Virtually all long-run studies on the euro tend to reach similar conclusions. Relative to long-run relationships between the currency and its fundamentals, they cannot explain the depreciation of the euro since 1999. In other words, if these models are correct, an exchange rate for the euro as low as 90 cents to the dollar, is undervalued – perhaps by as much as 20 per cent. Different estimates of the

equilibrium exchange rate of the euro are shown in the Table that reproduces part of the survey by Koen et al. (2001).

That exchange rate models work well in the long run, but have problems in forecasting short-run movements in the exchange rate, is a well-established fact (at least since the enduring contribution by Meese and Rogoff (1983)). What is worse, it is often the case that, comparing actual exchange rates with estimated equilibrium rates for major currencies, analysts discover that two series remain quite apart from each other for long periods of time – up to ten years.

But, apart from these well-known problems, we should not forget that the euro is something more than the sum of its parts. It may well be possible that there is something fundamentally different in the way the euro behaves, compared to the pre-existing European currencies. For one, we know that, before EMU, fluctuations in cross-Atlantic exchange rates had an impact on intra-European exchange rates, often acting as catalysts for speculative attacks and destabilising pressures. This empirical regularity was referred to as dollar-deutschmark polarisation. This is because, when the dollar strengthened against the deutschmark, currencies such as the Italian lira and the French franc tended to appreciate against the deutschmark as well (and vice versa). Downward swings of the dollar were particularly bad for European exchange rate stability. Giavazzi and Giovannini (1989) argue that almost all realignments in the European Monetary System were associated with swings in the dollar rate. Strikingly, the EMU crisis of September 1992 was preceded by a dollar crisis in August.

After the creation of the euro, the risk that dollar fluctuations would have an impact on nominal exchange rates within Europe obviously disappeared – with the important exception of the pound Sterling. This is an important structural break that can help explain why the ECB can take a more relaxed attitude toward the exchange rate than European central banks could take in the past (as suggested by Corsetti and Pesenti 1999). Yet, the economic root of polarisation may still be at work in Euroland.

By the same token, a large body of empirical work has documented that, before the creation of the euro, the exchange rate played quite a different role in the stabilisation of different European economies. Current econometric work based on past time-series of the synthetic euro is not able to capture this or other major transformations in the European economy. So, while the conclusions of long-term studies send a reassuring message from a policy perspective, they should not be overstated.