
The Euro and Financial Markets

The Euro and Money Markets: Lessons for European Financial Integration

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The financial landscape of Europe has been evolving rapidly in the past 20 years. The introduction of the euro and the inception of the single monetary policy on January 1, 1999, accelerated the pace of change. However, it is clear that many driving factors foster transformation in the European financial system, including the Single Market Program, technological developments, financial innovation, globalization, liberalization, increased competition, and deregulation (for a brief review, see Gaspar, Hartmann, and Sleijpen 2003, chap. 1).

The financial system is a key element determining the functioning and the performance of modern economies. It may be defined as the set of markets and institutions (intermediaries) through which households, firms, and governments channel available savings to investment opportunities (financing), carry out transactions (payments and settlements), and take relevant information into account (production of information, screening, and monitoring). The financial system is of key importance for the intertemporal allocation of resources, the allocation of risk, and the production of information. It is therefore not surprising to see a link between growth and finance associated with greater efficiency in the allocation of capital and, more generally, in the functioning of markets (see Hartmann et al. [2003] and Baele et al. [2004] for further references).

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One important aspect of this transformation is financial integration. By removing segmentation across national borders, financial integration is expected to lead to increased sophistication in financial instruments, increased liquidity, and stronger competition. The European Central Bank (ECB) is interested in European financial integration. Its interest is shown by the theme chosen for its Second Central Banking Conference, “The Transformation of the European Financial System” (see Gaspar, Hartmann, and Sleijpen 2003), by the publication of a *Monthly Bulletin* article (ECB 2003), and, more recently, by the release of an Occasional Paper (Baele et al. 2004).¹

A complete assessment of the state and prospects of financial integration in the euro area would require covering money, bond, equity, loan, and derivatives markets. It would also require covering a broad set of institutions, including banks, investment companies, mutual and pension funds, and insurance firms. It would further require a particular focus on clearing and settlement infrastructures. This chapter has a more modest aim: to focus on the money market, which is the financial market closest to the implementation of monetary policy and therefore the most likely to be directly affected by the start of the single monetary policy.

This chapter shows that after the introduction of the euro and the inception of the single monetary policy on January 1, 1999, the money market in the euro area integrated smoothly and rapidly. There are, however, different segments of the money market. For example, it is possible to distinguish between the market for unsecured interbank deposits and the repurchase agreement (repo) market. These two markets are characterized, according to some indicators, by persistently different degrees of market integration. This contrast will allow some reflections on the nature of remaining barriers to full financial integration in the euro area in general.

The Importance of Money Market Integration for Monetary Policy

The Eurosystem implements monetary policy through the money market. Its operational framework is predicated on a well-functioning money market, requiring only a limited presence of the monetary authority. The Eurosystem’s operational framework is based on three key elements. First, reserve requirements, with an averaging provision over the reserve maintenance period, allow banks to spread out the impact of liquidity

1. In this paper, Baele et al. systematically review the available evidence on quantitative indicators of the integration of money, sovereign bonds, corporate bonds, equity, and credit markets in the euro area. The paper is required reading for anyone who wants a complete review of research on financial integration in the euro area.

shocks over time and thereby help to contain volatility in overnight interest rates. Required reserves (together with the net effect of so-called autonomous liquidity factors) also create a structural liquidity shortage for the banking system as a whole, ensuring that the central bank will be regularly required to supply liquidity to the system.

The second key element is standing facilities. The Eurosystem provides two such facilities, a marginal lending facility and a deposit facility. Both are used on the initiative of commercial banks. The two standing facilities define a corridor (or band) for overnight rates.² The third key element, open market operations, is used to control liquidity conditions in the market. In its regular main refinancing operations, the Eurosystem uses repos, supplying liquidity by buying assets under a repo or granting loans against adequate collateral.³ Money market integration is therefore crucial for the implementation of the single monetary policy because it provides the locus for the first step in the monetary policy transmission mechanism.

Gaspar, Perez-Quiros, and Sicilia (2001) document the story of what they call the “learning period” in the money market. This period is identified with the three weeks after the introduction of the euro. More precisely, it covers the period from January 4 to 21, 1999. They argue that the introduction of the new operational framework proceeded remarkably smoothly. If one focuses on volatility or cross-bank dispersion in overnight interest rates, the effects found are much smaller than the effects associated with recurring events such as the end of a reserve maintenance period.

This finding is all the more surprising because national money markets, before the start of the single monetary policy, displayed important distinctive features (as surveyed, e.g., in Escrivá and Fagan 1996). Gaspar, Perez-Quiros, and Sicilia (2001) also look at the dispersion of interest rates across banks. For this purpose, they use the interest rates obtained by the major European banks when they lend funds in the overnight market. In particular, each data point represents the average interest rate charged in that day by each lending bank. The dataset was provided by the European Banking Federation (EBF) and is the one used to compute the time series for the Euro Overnight Index Average (EONIA), which is based on data from a panel of more than 50 banks. It is important to emphasize that observations in the EBF database correspond to actual trades. They show that at the very beginning of the single monetary policy, that is, during the first business week of 1999, some banks reporting to the EONIA panel lent at rates above the marginal lending facility. On January 5, 1999, the dif-

2. See Woodford (2003) for a general description of the functioning of such a system and Hartmann, Manna, and Manzanares (2001) for a broad discussion of how the operational framework of the Eurosystem relates to the euro money market.

3. See ECB (2004a, 2004b) for detailed official descriptions of operational procedures and their relation to monetary policy.

ference was about 25 basis points. The dispersion of rates reported subsequently narrowed to low levels.

During the period from January 4 to 21, 1999, the corridor defined by the two standing facilities was temporarily narrowed to 50 basis points, which limited the volatility that might have been associated with the transition to the new regime. When the corridor was widened to its normal size, the market rate (measured by the EONIA rate) remained stable and close to the Eurosystem's main refinancing operations rate of 3 percent. The dispersion of rates across banks was also already much lower on January 22.

However, Gaspar, Perez-Quiros, and Sicilia (2001) provide evidence showing that the transition was not, strictly speaking, instantaneous and that learning did take place. They identify a number of inefficiencies and other forms of abnormal behavior during the first days of the month—for example, the above-mentioned trading at rates significantly higher than the marginal lending facility on January 5. However, they also show that banks have adapted quickly and easily to the new environment.

Money Market Integration in the Euro Area: Two Different Sides of the Same Coin

Focusing on intercountry differences, Baele et al. (2004) document the integration of money markets in the euro area, using the cross-sectional standard deviation of unsecured lending rates, among the 12 average country rates.⁴ They also use data from the EONIA panel of banks referred to above.

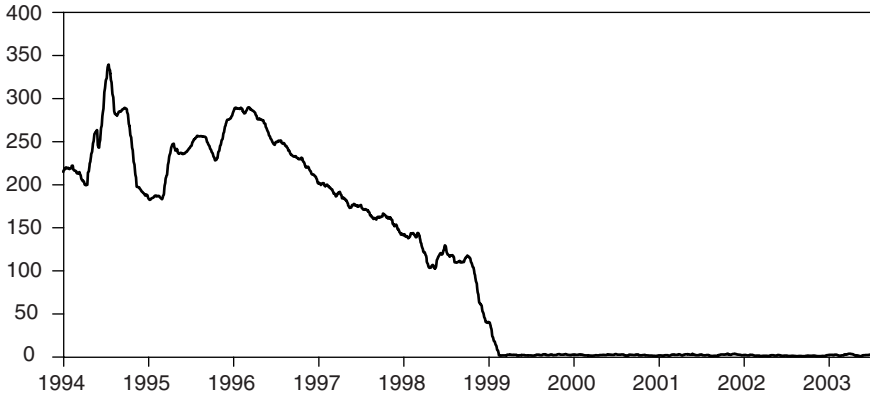
Figures 5.1, 5.2, and 5.3 respectively plot the results for overnight, 1-month, and 12-month maturities.

Focusing on the overnight rate, the relevant standard deviation was several hundred basis points in the mid-1990s. It has then reduced, very gradually, starting in 1996, to somewhat above 100 basis points for most of 1998. Toward the end of the year, the standard deviation declined sharply, converging to levels in the range of 1 to 4 basis points. It confirms the existence of a well-integrated market across countries. The almost complete disappearance of cross-country differences after the start of the single monetary policy was also documented earlier by Santillan, Bayle, and Thygesen (2000), who found that cross-border differences had been reduced to a 2- to 4-basis-point range, and by Hartmann, Manna, and Manzanares (2001, figure 4), who plotted intraday overnight rates quoted

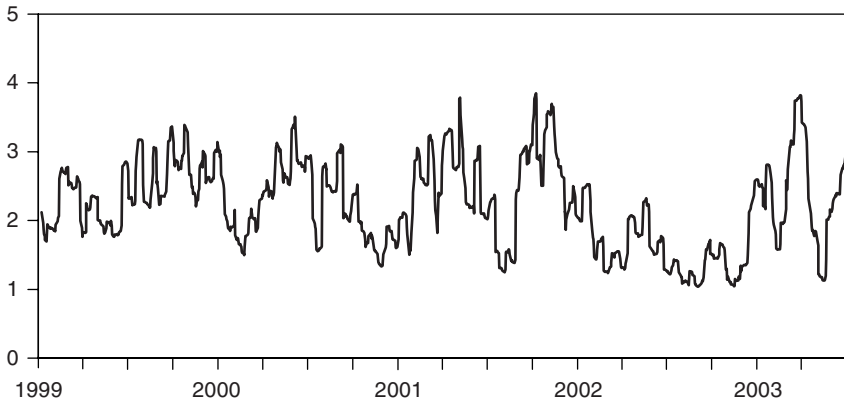
4. There were 11 average country rates before Greece joined the euro area in 2001. The period before 1999 is added to provide a benchmark for comparison. It is clear, however, that the presence of exchange rate risk prior to 1999 allowed for decoupling of national money market rates. In any case, the convergence of economic developments and policies and the increased credibility of convergence toward monetary union led to a gradual narrowing of interest rate differentials.

Figure 5.1 Cross-sectional standard deviation of the average lending rates for overnight maturities among euro area countries (30-day moving average)

1994–2003



1999–2003



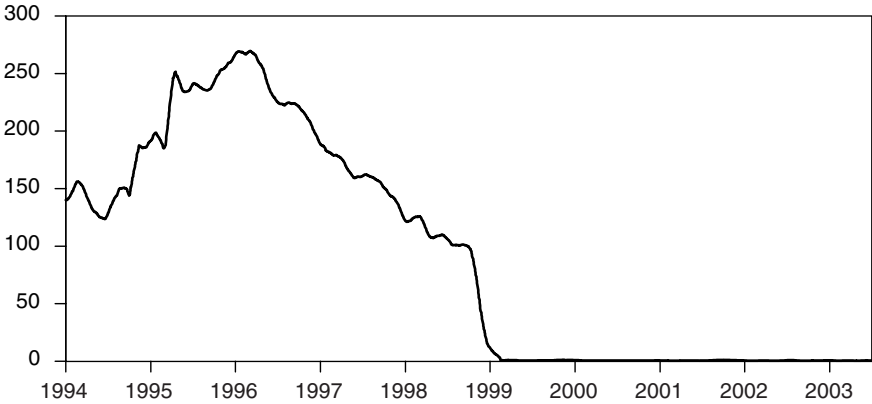
Source: Baele et al. (2004).

by brokers located in different euro area countries. Integration is also suggested by the sharp increase in cross-border unsecured interbank lending between euro area countries at the time of the introduction of the euro, as documented, for example, by Hartmann, Maddaloni, and Manganelli (2003, figure 7).

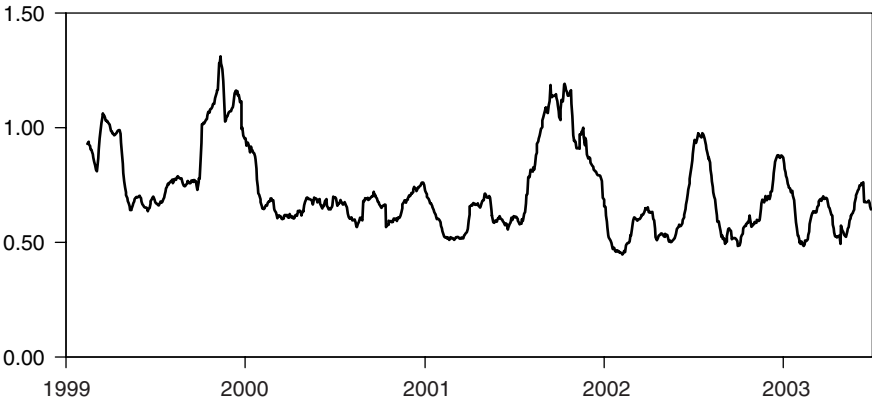
Gaspar, Perez-Quiros, and Rodriguez-Mendizabal (2004) also look at the cross-sectional dispersion of the EONIA overnight rate. They charac-

Figure 5.2 Cross-sectional standard deviation of unsecured lending rates for 1-month maturities among euro area countries (30-day moving average)

1994–2003



1999–2003

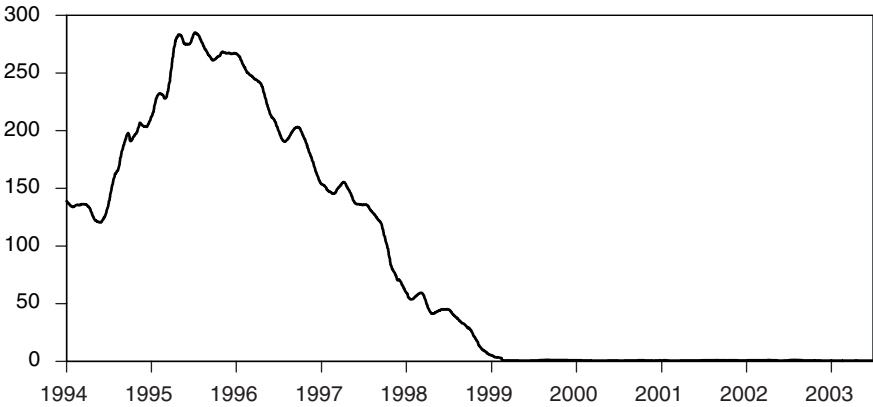


Source: Baele et al. (2004).

terize the distribution of rates across contributing banks and study how it evolves over time. Baele et al. (2004) look instead at the *difference* between the cross-country EONIA rate deviations and the corresponding measure within a country. Specifically, they compute the ratio between the average cross-country EONIA rate deviations and the average within-country deviations. The data from Baele et al. (2004) are plotted as figure 5.4.

Figure 5.3 Cross-sectional standard deviation of unsecured lending rates for 12-month maturities among euro area countries (30-day moving average)

1994–2003



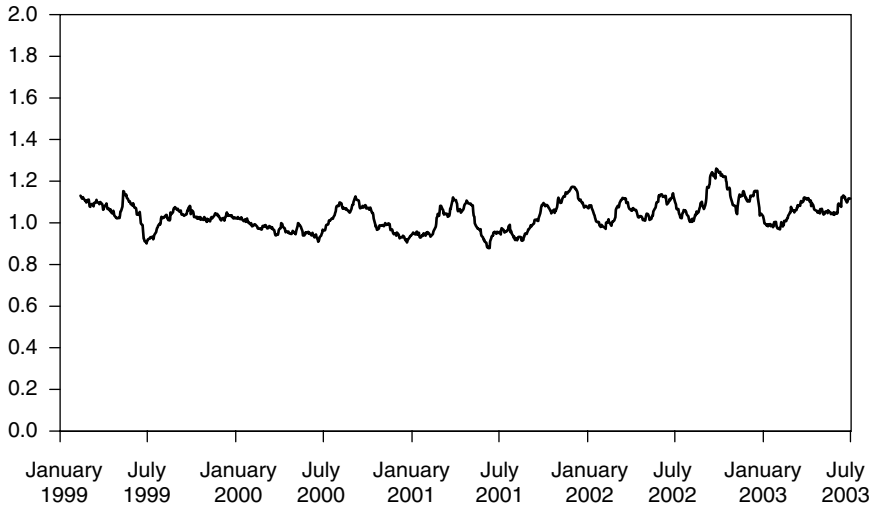
1999–2003



Source: Baele et al. (2004).

Baele et al. argue that one should expect the ratio to be close to 1 if the market is strongly integrated. Interestingly, figure 5.4 does indeed show that the ratio remained quite close to 1 throughout the 1999–2003 period, with some registered values below unity. These results are consistent with a very high degree of cross-country integration of the overnight money market.

Figure 5.4 Ratio between average cross-country Euro Overnight Index Average (EONIA) rate deviations and average within-country deviations (30-day moving average)

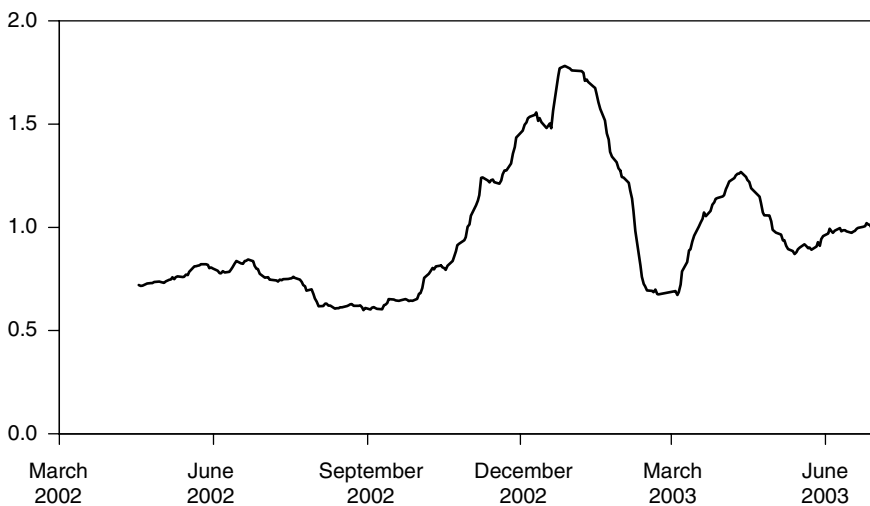


Source: Baele et al. (2004).

In order to interpret these results, it is useful to recall that liquidity distribution in the euro area follows a two-tiered structure (see, e.g., Santillan, Bayle, and Thygesen 2000; Freixas and Holthausen 2001; Ewerhart et al. 2004). The idea is that cross-border trading occurs predominantly among large banks, with smaller banks concentrating on their respective national markets. The interest rates, reported in the EONIA panel, refer to actual lending rates for operations of the contributing banks. As was stressed above, the EONIA sample includes the major European banks. In the light of the two-tiered-structure hypothesis, differences between the deviation within and across countries would measure the relative density of the network of relationships in the money market. If the ratio were consistently close to 1, that would suggest outcomes equivalent to those that would be found if the network of relationships were independent from location. In such a case, conditions prevailing in the different national segments are equivalent and the market is fully integrated.

Building on their findings, reported above, Baele et al. (2004) go further and contrast the developments in the unsecured market with developments registered in the repo market. Long time-series data on repos, comparable to the ones from EONIA for the unsecured market, do not exist. Therefore it is not possible to produce the exact analogues of figures 5.1 through 5.4 from repo markets.

Figure 5.5 Cross-sectional standard deviation of one-month repo rates among euro area countries (30-day moving average)



Source: Baele et al. (2004).

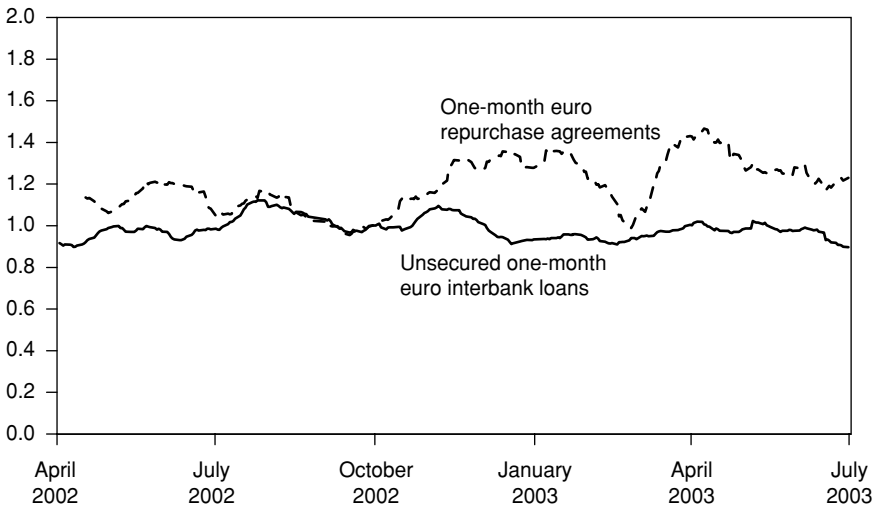
From early 2002 on, it is possible to rely on the panel contributing to the so-called Eurepo indices relating to repurchase agreements denominated in euro. The Eurepo indices allow for comparability across countries because the collateral used is standardized and the risk characteristics of banks are similar.⁵ Figure 5.5 shows that the degree of integration across countries is very high. Standard deviations range from 0.5 to 2 basis points.

The interesting insight from Baele et al. (2004) was, however, that it is possible to learn more by focusing on the *difference* between the corresponding ratios between the average cross-country interest rate deviations and the average within-country deviations (see figure 5.6).

The point of interest here is that the ratio is significantly and persistently above 1 for the repo market measure. Before going further, it is important to recall that we are focusing on a ratio with a few basis points in the numerator and the denominator. Deviations of only a few basis points still reveal a generally efficient and well-integrated market. Nevertheless, the contrast between the repo and unsecured markets is striking. Recall-

5. The Eurepo panel is compiled by the European Banking Federation. The number of contributing banks is about 40. The characteristics of the panel are similar to those of the EONIA.

Figure 5.6 Ratios between average cross-country interest rate deviations and within-country deviations



Source: Baele et al. (2004).

ing our interpretation given above, the results suggest that the outcomes in the repo market are systematically different from those that would prevail if the network of relationships were independent of location or nationality. They suggest that the degree of integration in the repo market is lower than in the unsecured interbank market.⁶

Remaining Obstacles to Financial Integration in the Euro Area

Why is the repo market less integrated than the overnight deposit market in the euro area? Interestingly, the answer to this question not only is relevant for the money market but also indicates more generally what are the obstacles to financial integration in the euro area. This means it also identifies obstacles to the further integration of, for example, bond and equity markets.

First of all, repos are relatively complex contracts, because the provision of interbank credit is collateralized with securities. The euro area is characterized by different legal systems in different countries. For example,

6. See ECB (2002) for a survey of initiatives aim at increasing repo market integration.

bankruptcy laws and procedures are not fully harmonized. Therefore there coexist a variety of master agreements that can guide repo contracts. And different market participants tend to use different agreements. For example, the importance of the European Masters Agreement—which can be used in multiple jurisdictions according to the respective local law—grows only slowly. So the heterogeneity of repos and their noninterchangeable character is one reason that the law of one price does not hold in the euro repo market with the same degree of precision as in the unsecured euro money market.

A further feature of collateralized lending is that the securities have to be transferred back and forth between the transacting parties. Although this is very easy and cheap within a given country, the same does not apply to cross-border securities transfers. The reason is that each country has its own securities settlement systems and a transfer often involves several of those systems. This handicap is of course very pronounced in Europe, for the euro area is composed of different countries. The fragmentation of securities settlement infrastructures in Europe makes those transfers much more complicated and costly than, for example, in the United States. A recent study by Schmiedel, Malkamäki, and Tarkka (2002) estimates, for example, that the average unit costs of cross-border securities transfers are on the order of \$40, whereas within countries they are only about \$3. Hence, the large costs of cross-border securities transfers are another reason for the remaining interest rate differentials in the euro repo market.

Legal heterogeneity and fragmented market infrastructures provide obstacles not only for the integration of repo markets. They are similarly important for securities markets in general. For example, the literature has illustrated well the scope for further integration of European bond and stock markets (see, e.g., Baele et al. 2004; Gaspar, Hartmann, and Sleijpen 2003; and Hartmann, Maddaloni, and Manganello 2003).

Conclusions

In this chapter, we have tried to illustrate the general issues relevant for understanding European financial integration by focusing on the money market. The link between the money market and the framework for implementing the single monetary policy makes it the natural starting point when trying to illustrate the impact of the introduction of the euro on European financial market integration. It is clear that after a short and smooth learning process (of less than three weeks in early 1999), the overnight market for unsecured deposits integrated fully. This is a key development because a common short-term interest rate represents the first step in the transmission mechanism of monetary policy.

More instructive for identifying remaining obstacles to integration are the differences between the unsecured market and the repo market. Cross-

border interest rate differentials are only really relevant for the latter. The differentials illustrate that the process of integration is as yet far from complete. To explain the patterns seen, the most relevant factors are likely to be differences in laws, regulations, and practices, and the fragmentation of the market infrastructure, in particular clearing and settlement systems. These factors are also of general relevance for the integration of bond and equity markets.

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Financial Market Integration, the Euro, and the Role of Growth

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It is significant to see how entirely all the rest of the Geographically Distributed stocks differ in their price movements from the British stock. It is this individuality of movement on the part of each security, included in a well-distributed Investment List, which ensures the first great essential of successful investment, namely Capital Stability.

—Henry Lowenfeld, *Investment: An Exact Science* (1909, 49)

Financial market integration and the comovement of stock prices have been a subject of interest for a century—if not longer. During this period, world equity markets have gone through various phases of integration. Returns in the world's major stock markets were highly correlated in the early 1900s, but then integration declined during the World Wars and in the 1970s (see Goetzmann, Li, and Rouwenhorst 2001). Since the 1980s, however, global financial market integration and the comovement in the world's major stock markets have steadily increased.

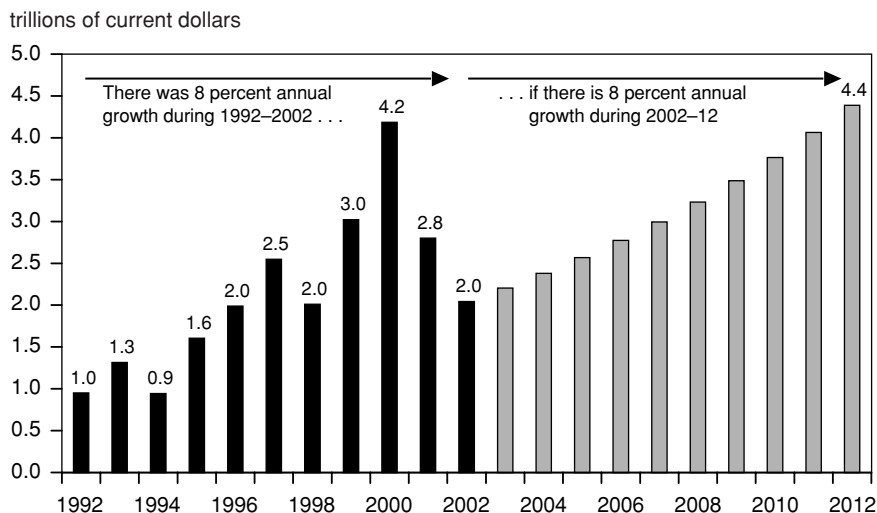
This increased comovement in global stock markets is not surprising given the recent surge in capital flows across borders. Between 1992 and 2002, global capital flows increased by an average of about 8 percent a year to nearly \$2 trillion (equivalent to about 6 percent of global GDP). As is shown in figure 5.7, if global capital flows continue to grow at this average rate, they could more than double in the next decade to more than \$4 trillion.

Almost half of global capital flows in 2002 were in the form of portfolio investment—purchases of stocks, bonds, securities, and notes in one country by citizens of another country. As a result, financial market movements in one country can quickly affect the earnings of investors, corporations, and governments located in other countries. It is not surprising that movements in stock and bond markets in large countries can rapidly spread to financial markets around the globe.

How will this increased financial market integration affect the prospects for the euro? To answer this question, this chapter begins by exam-

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Figure 5.7 Actual and extrapolated global capital inflows, 1992–2012



Sources: Capital flow data from 1992 to 2002 calculated using data from the IMF's International Financial Statistics Database and *Global Financial Stability* report.

ining different factors that can drive financial market integration between Europe and the rest of the world—such as increased capital flows and trade flows—and how these factors may evolve in the future. The chapter then takes a different approach to answering this question by examining how stock market integration has already changed since the advent of the euro. No matter which approach is chosen, one recurrent theme is the critical role of economic growth.

If Europe's growth prospects improve, trade and capital flows will increase more rapidly, raising Europe's financial market integration with other countries and increasing the relative demand for the euro and euro-denominated assets. If growth in Europe lags that in other large economies, however, investors will seek higher return opportunities in other regions and companies will seek to expand trade with other countries. Financial market integration between Europe and the rest of the world would proceed more slowly, and although the euro would undoubtedly remain a leading global currency, its role in the global economy may not substantially mature from that of today.

Capital Flows, Financial Integration, and the Euro

As transaction costs fall and investors become more accustomed to holding assets in other countries, cross-border capital flows will continue to

increase. This increased willingness to diversify investment portfolios across countries is already apparent in a reduction in home bias in the past decade.⁷ This trend not only will cause Europeans to increase their holdings of assets outside of Europe but also will cause non-Europeans to increase their holdings of European assets. The aggregate effect on the demand for European assets, however, is less clear. Will this trend of increased cross-border capital flows lead to net capital flows into or out of Europe? If increased foreign demand for European assets is greater than the increased European demand for foreign assets, this could generate net capital inflows. Conversely, if the increased European demand for foreign assets is greater than the increased foreign demand for European assets, this could generate net capital outflows.

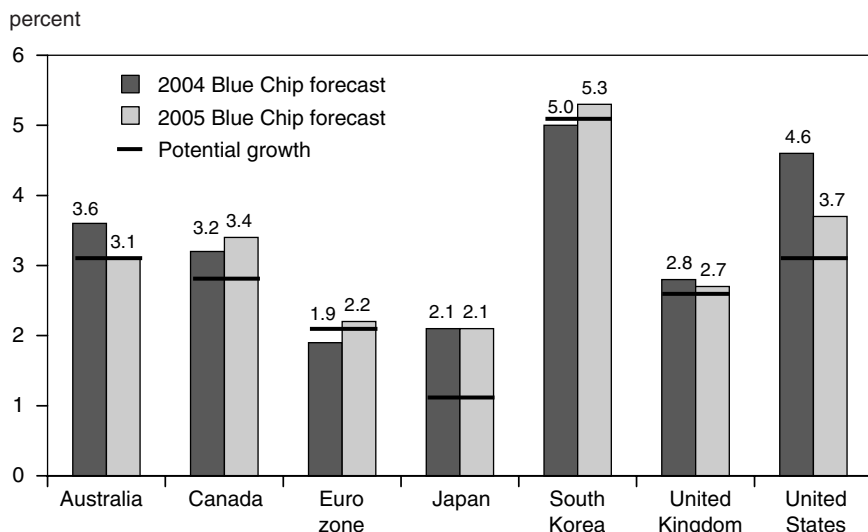
One of the key determinants of whether increased capital mobility will generate net flows into or out of Europe will be European growth prospects. If investors believe that growth in Europe will recover and remain strong, earnings prospects for European companies should improve. Foreigners will seek to increase their investments in European stocks and bonds. Conversely, if growth in Europe lags that in other countries, foreign investors and Europeans will instead seek to increase investments in higher-growth regions.

This situation leads to the next question: What are growth prospects for the eurozone? Blue Chip estimates suggest that growth in the eurozone is expected to improve from 0.9 and 0.6 percent in 2002 and 2003, respectively, to 1.9 and 2.2 percent in 2004 and 2005. (All statistics cited in this paragraph are from the "Blue Chip Economic Indicators," February 2004.) Despite this improvement, figure 5.8 shows that growth in the eurozone is still expected to lag that in many other large economies in the world—such as the United States, which is expected to grow by 4.6 percent in 2004, and even Japan, which is expected to grow by 2.1 percent.

Moreover, the IMF estimates that the potential growth rate for the eurozone is only 2.1 percent. This is substantially below the estimated 3.1 percent for the United States and the 2.6 percent average for the OECD countries (which include the eurozone), although it is higher than the 1.1 percent estimated potential growth rate for Japan. Of course, if European governments embarked on an aggressive agenda of structural reform, removing impediments to growth such as policies limiting labor market flexibility, Europe's long-term potential growth rate could improve. Any such reforms that raised European growth rates should increase demand for European assets, stimulating capital inflows and increasing relative demand for the euro.

7. E.g., Greenspan (2003) states that for the countries belonging to the Organization for Economic Cooperation and Development (OECD), the GDP-weighted correlation between domestic saving rates and domestic investment rates (a standard measure of home bias) fell from 0.96 in 1992 to less than 0.8 in 2002.

Figure 5.8 Expected annual GDP growth



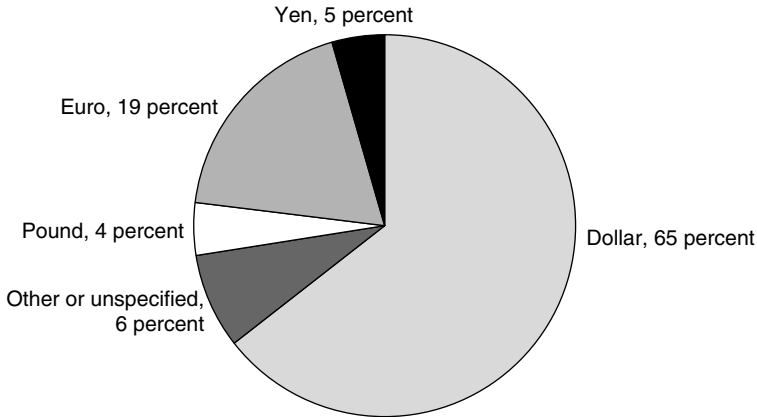
Source: Blue Chip Economic Indicators, forecasts from February 2004.

In addition to expected growth rates, any other factors that affect the expected return on European assets will influence investors' willingness to hold European assets. One such factor is expected currency movements. If investors believe that the euro will appreciate against other major currencies, this will raise the expected return on European assets relative to assets in other currencies. An extensive literature suggests, however, that predicting currency movements can be extremely difficult and imprecise.

Even though it is difficult to predict future exchange rate movements, increased uncertainty about these movements could also cause investors to increase the diversification of their portfolios. For example, some investors—and especially central banks—tend to have a small proportion of their assets denominated in euros. Figure 5.9 shows that only 19 percent of identified official foreign exchange reserve holdings were held in euros in 2002. In sharp contrast, about 65 percent of these reserve holdings were held in dollar-denominated assets (largely US Treasuries). This large share of dollar holdings is due to factors such as the large size of the United States in the global economy (the United States accounted for about 34 percent of global GDP in 2002, calculated at market exchange rates), the large share of global trade denominated in dollars, the high liquidity and low risk of US assets, and the dollar's historical importance in the global economy.

Despite these compelling reasons to hold a large share of reserves in dollar-denominated assets, standard portfolio theory suggests that some central banks, especially in countries with a large share of trade with

Figure 5.9 Share of identified official foreign exchange holdings (end of 2002)



Source: Data from the revision to the IMF's *Annual Report* (2003).

Europe, might choose to increase their holdings of euro-denominated assets at some point in the future. This will be even more likely if the increasing financial integration of Europe improves the liquidity of euro-denominated assets. There is no reason to expect that any such shift would be rapid, but if foreign central banks did decide to increase their holdings of euro-denominated assets over time, this could cause the euro to slowly appreciate.

Once again, however, a critical determinant of whether foreign central banks would likely increase their holdings of euro-denominated assets in the future is the growth performance of the European economy. Europe accounted for about 30 percent of global GDP in 2002 (calculated at market exchange rates). If the growth rate in Europe does not improve, Europe's share in the global economy will decrease over time (especially given the rapid growth of other large economies, e.g., China and India). In this scenario of slow growth in Europe, foreign central banks would have less incentive to increase their holdings of euro-denominated reserves.

Trade Flows, Financial Integration, and the Euro

Although the effect of trade flows on financial market integration may not be as obvious as the effect of capital flows, the academic literature suggests that trade flows can also be important determinants of financial integration. For example, Forbes (2004) examines why movements in large stock and bond markets affect financial markets around the world. The results

show that during the most recent period for which data are available, from 1996 to 2000, bilateral trade flows were large and important determinants of how financial market movements were transmitted to other countries. In fact, the empirical estimates suggest that trade flows may be even more important in explaining financial market integration than cross-country linkages through foreign direct investment and bank lending.

Forbes (2004) also includes estimates of the magnitude of the relationship between trade flows and the integration of stock and bond markets. For example, the study estimates the effect on financial market integration between Chile and the United States if Chile (which just completed a free trade agreement with the United States) increased trade with the United States to a level comparable to that for Mexico (which has had a free trade agreement with the United States since 1994).⁸ A 10 percent return in the US stock market is currently correlated with a 2.7 percent return in the Chilean market. If Chile increased its trade integration with the United States to Mexico's levels, however, a 10 percent return in the US market would instead be correlated with a 7.0 to 7.5 percent return in the Chilean market.⁹ These calculations are only a rough approximation, but they do suggest that changes in trade flows can have large effects on how financial market movements are transmitted from one country to another.

To predict how trade flows might affect European financial market integration and demand for the euro, it is therefore necessary to discuss expected future trends in European trade flows. Just as global capital flows have increased during the past decade and are expected to continue to grow, trade flows have also increased during past decades and should continue to grow. Granted, increased support for protectionism could slow trade liberalization, but even setbacks such as the disappointing progress in the Doha Development Agenda of trade liberalization are unlikely to stop the steady increase in global trade.

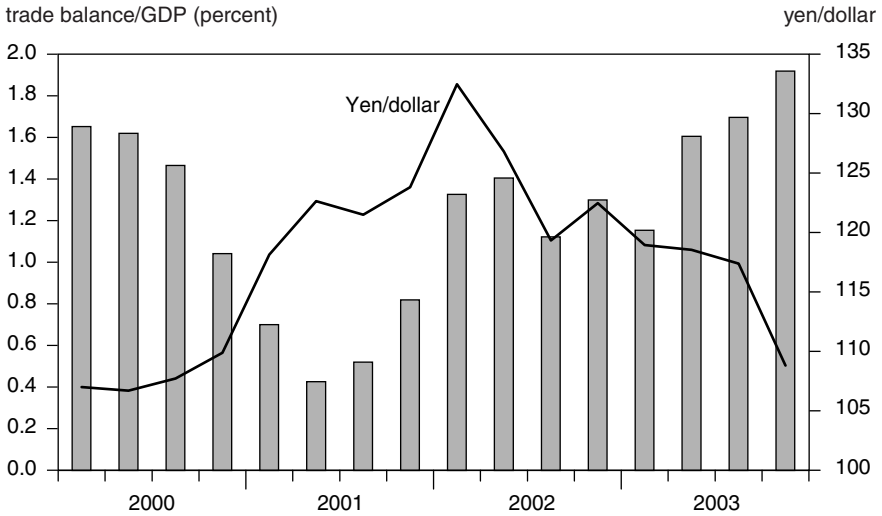
If trade flows between Europe and the rest of the world increase, however, leading to greater financial market integration between Europe and the rest of the world, it is unclear how this will, in turn, affect the value of the euro. Increased demand for European exports would increase demand for the euro and tend to cause it to appreciate (assuming everything else remains constant). But increased imports into Europe would have the opposite effect.

All in all, increased financial integration resulting largely from increased trade flows may not, in and of itself, have any substantial effect on demand for the euro. This is more likely to be true if increased trade is

8. More specifically, assume that Chile increased its ratio of imports from the United States to GDP from its average level of 4 percent between 1996 and 2000 to the average ratio of 25 percent for Mexico over the same period.

9. These estimates are based on the version of the model estimated using local currency stock returns and controlling for global and cross-country factors.

Figure 5.10 Japan's trade balance and exchange rate, 2000–03



Note: Bars represent quarterly data for each year indicated.

Source: Data from Haver Analytics.

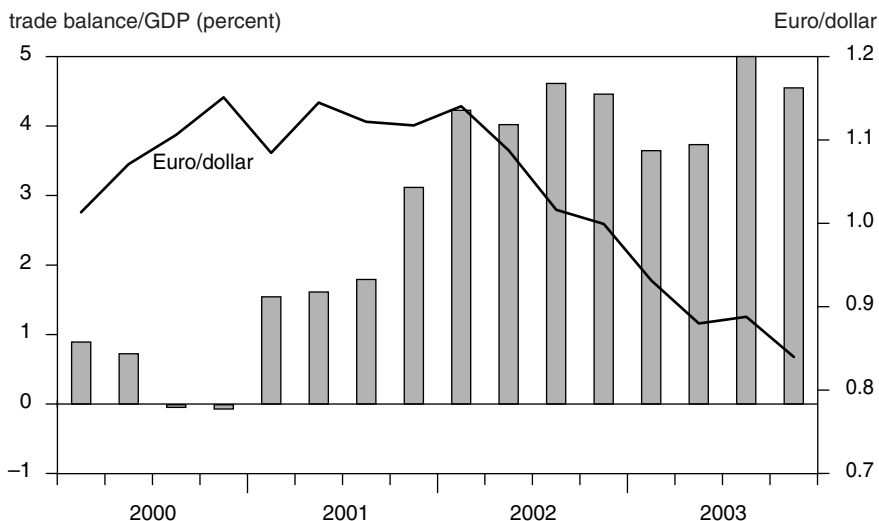
relatively balanced between imports and exports. For the eurozone, trade is currently fairly balanced, with the entire region running a trade surplus in goods and services of about 2 percent of GDP in 2003.

Rather than increased trade flows affecting the value of the euro, more attention has recently been paid to the reverse effect—how recent currency movements affect trade flows. More specifically, as the euro and yen appreciated against the dollar in 2002 and 2003, there has been increasing concern that this will decrease European and Japanese exports. Economic theory and empirical evidence do show that, holding everything else constant, a currency appreciation normally tends to reduce exports, increase imports, and decrease a trade surplus (or increase a trade deficit) after a period of roughly a year.¹⁰ Rarely, however, is “everything else held constant.”

Instead, experience suggests that this predicted effect of currency movements on exports and trade balances can be outweighed by differences in growth rates across countries. The recent performance of exchange rates and trade balances in Japan and several European countries reflects this pattern. Figure 5.10 shows that between the first quarter of

10. The immediate effect of an appreciation, however, can be the opposite because prices adjust immediately and trade volumes only adjust with a lag. Due to this “J-curve effect,” an appreciation can cause export values to increase, import values to fall, and the trade surplus to increase for several months. Also, in some cases when a country has a large share of debt denominated in foreign currency and/or is highly dependent on imported inputs, the traditional effects of exchange rate movements can be mitigated.

Figure 5.11 Germany's trade balance and exchange rate



Note: Bars represent quarterly data for each year indicated.

Source: Data from Haver Analytics.

2002 and the fourth quarter of 2003, the yen appreciated by 20 percent against the dollar. During the same period, Japan's trade surplus increased (instead of decreased) from 1.3 to 1.9 percent of GDP. One of the key reasons for the increase in Japan's trade surplus during the period of yen appreciation was faster growth in Japan's major export markets, especially in China and other Asian countries. This trend has recently continued. Japan's trade surplus in goods increased sharply in the first quarter of 2004. This increase was caused by a surge in exports (which increased more than 30 percent in yen during the first quarter of 2003) to high-growth China.

Several countries in the eurozone have also experienced an increase in their trade surpluses (or a decrease in their trade deficits) after the substantial appreciation of the euro (and over a long enough period that any J-curve effect would have disappeared). For example, figure 5.11 shows that when the euro was at its most depreciated level against the dollar in October 2000, Germany's trade in goods and services was basically balanced (with a small deficit of 0.06 percent of GDP). The euro/dollar exchange rate fluctuated for several months, and then the euro steadily appreciated in 2002 and 2003, for a total appreciation of 30 percent between October 2000 and October 2003.

During the same period, however, Germany's trade balance shifted to a large surplus of 4.6 percent of GDP. Despite the appreciation of the euro,

slower growth in Germany caused imports to fall by about 9 percent, and faster growth in its major trading partners caused German exports to increase by about 5 percent during the same period. These examples clearly suggest that although exchange rate movements can affect trade balances, these effects can be overwhelmed by the effect of differences in growth rates on trade flows.

The Recent Impact of the Euro on Stock Market Integration

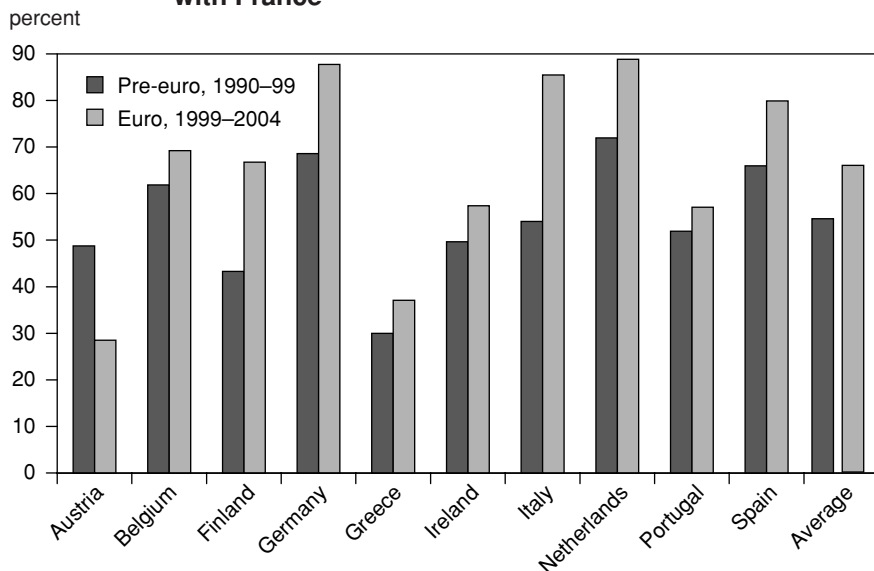
Instead of trying to predict how increased capital flows and trade flows might affect financial market integration and demand for the euro in the future, a different approach is to examine how the recent introduction of the euro has already changed financial integration within Europe and between Europe and other major economies. When the euro was adopted in 1999, it was widely expected that this should increase financial market integration within the region by reducing transaction costs and reducing the uncertainty from exchange rate movements. This increase in financial market integration could have occurred through increased financial flows as well as increased trade flows, all of which would be expected to increase stock market comovements in the region.

As a rough test of whether the introduction of the euro actually did increase stock market comovement, figure 5.12 graphs the weekly correlation in stock market returns between France and each of the eurozone countries, before and after the introduction of the euro (from 1990 to 1999, and then from 1999 to 2003).¹¹ The figure shows that for most countries in the eurozone, stock market correlations with France did increase substantially after the introduction of the euro. For example, the correlation in stock market returns between France and Italy increased from 54 to 85 percent, and the correlation with Spain increased from 66 to 80 percent. For all 10 countries in the sample, stock market correlations with France increased by an average of 16 percent from the period 1990 to 1999 compared with the period after the introduction of the euro.

As was discussed above, however, financial market integration increased around the world in the 1990s. As a rough test of whether this increase in stock market correlations between France and the eurozone results from the introduction of the euro or is instead part of a broader global trend of increased integration, figure 5.13 performs the same analysis, except that it shows correlations between the eurozone economies and

11. I focus on France because it is one of the largest economies in the eurozone. The results from Germany are similar but present a less clear example due to the shock of German unification during this period.

Figure 5.12 Stock market correlations of other EU members with France



Note: Correlations based on weekly stock market returns for the country’s main stock market index.

Source: Author’s calculations.

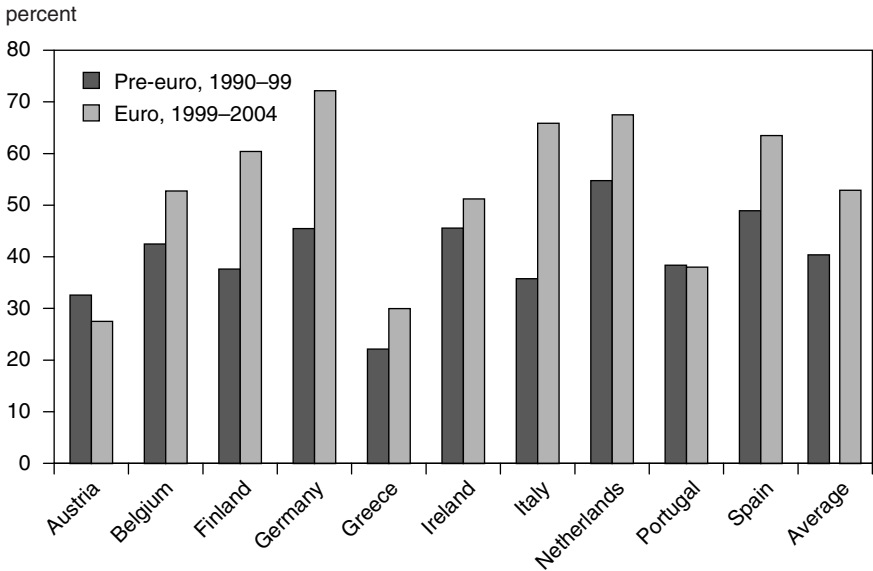
the United States.¹² As would be expected, correlations between most of the eurozone economies and the United States are lower than between the same countries and France. Correlations between almost all the countries and the United States increased, however, after the euro was introduced. For example, the correlation in stock returns between the United States and Italy increased from 36 to 66 percent, and the correlation between the United States and Spain increased from 49 to 63 percent.

In fact, for the 10 countries in the sample (excluding France for consistency), stock market correlations with the United States increased by an average of 25 percent from the period 1990 to 1999 compared with the period after the introduction of the euro—greater than the 16 percent increase between the eurozone countries and France.¹³

12. The central results in this section are unchanged (although the point estimates of the correlation coefficients do vary slightly) if stock market correlations are adjusted for changes in volatility across periods, using the correction in Forbes and Rigobon (2002).

13. A similar analysis of stock market correlations between the United Kingdom and the same sample of 10 eurozone countries shows a similar result. The correlations with the United Kingdom increased from the period 1990 to 1999 compared with the period after the adoption of the euro by virtually the same percentage, on average, as correlations with France, despite the United Kingdom’s remaining outside the eurozone.

Figure 5.13 Stock market correlations of EU members with the United States



Note: Correlations based on weekly stock market returns for the country's main stock market index.

Source: Author's calculations.

Therefore, although financial market integration within the eurozone has increased since the introduction of the euro, this increase does not appear to have occurred any faster than the increase in financial market integration between the eurozone countries and the United States. One possible explanation for this trend is that faster growth in the United States, which stimulated trade and capital flows between the United States and the eurozone countries, helped stimulate this greater increase in financial market integration. This effect of faster growth on stock market integration may have been even greater than the effect of adopting a single currency. Although this is clearly not a formal empirical analysis, and there are many other factors that determine financial market integration in addition to market comovements, it does support the argument that economic growth can be an important determinant of financial market integration.

Conclusions: The Role of Growth

This chapter has considered various channels by which increased capital flows and trade flows can increase financial market integration, and how

all these variables could, in turn, affect demand for the euro. One theme pervading this discussion is the critically important role of growth. Countries that are expected to grow faster will tend to receive greater capital inflows, thereby stimulating greater financial market integration. Central banks are more likely to hold reserves in the currencies of countries with strong growth performance. Increased trade flows are correlated with greater financial market integration, and countries that are more open to trade tend to grow faster. Differences in growth rates across countries can significantly affect trade flows, and even outweigh the standard effects of currency movements. Although stock markets in the eurozone countries became more financially integrated after the adoption of the euro, these stock markets became relatively more integrated with the faster-growing US economy during the same period.

Economic growth is critically important. Its role and effects are so pervasive that it can be difficult “to think about anything else” (Lucas 1988, p. 5). This chapter suggests that Europe’s future growth performance will be a decisive factor, and possibly the most decisive factor, in determining the evolution of European capital flows, trade patterns, financial market integration, and demand for the euro. Therefore, it is difficult to discuss the prospects for the euro without simultaneously discussing the even more fundamental question of the prospects for economic growth in Europe.

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The Impact of a Five-Year-Old Euro on Financial Markets

HÉLÈNE REY

In “The Emergence of the Euro as an International Currency,” Richard Portes and I argued back in 1998 that the creation of the euro “[would] have substantial implications for the international monetary system; for the currency composition of portfolios; for exchange rates, and hence monetary policies; and for economic efficiency and welfare. The key determinant of the extent and speed of internationalisation of the euro [would] be transaction costs in foreign exchange and securities markets” (Portes and Rey 1998, 307–08). We noted also that the entry (or non-entry) of the United Kingdom into Economic and Monetary Union would play a significant role, because of the size and sophistication of that country’s financial markets.

When central banks are equally credible, market size and liquidity become very important factors in determining whether a currency is widely used by market participants around the world or not. We developed the idea that, due to the sheer size of the euro area, a common European currency would have profound effects on international and European financial markets (see also Bergsten 1997). First, it would lead to more disintermediated finance in Europe. It would also increase the liquidity of different financial markets via well-known synergies between the different roles played by a global currency. Efficient capital markets attract more capital inflows, which raises the liquidity of the foreign exchange market. In turn, more liquid foreign exchange markets reduce the costs of portfolio substitution, which raises the turnover on home financial assets and cuts transaction costs even further, and so on.

Having a widely used currency and well-developed financial markets matters for investment and hence for growth. This is a well-established result in recent empirical literature, and it goes beyond the traditional international currency’s benefits of seigniorage, lower exchange rate risks for one’s exporters and importers, easier current account deficit financing (with issuance of liabilities denominated in one’s currency), and political influence.

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It is now time, after five years of the euro's existence, to make a preliminary assessment of both its role on the international scene and its contribution to the deep structural changes undergone by European financial markets in recent times. In this chapter, I briefly review the main recent developments in the euro area's government bond, corporate bond, derivative, and equity markets. I argue that the creation of the euro has led to spectacular developments in European financial markets, with the emergence of new markets and in most cases a significant increase in the liquidity and integration of existing markets. I then report on the role of the euro in the international arena and contend that the increase in the use of the euro has been unequally distributed across markets and has been in general quite slow. Finally, I suggest as a possibility that the international use of the euro may be accelerated in the future by a shift of market participants out of dollar assets due to the unprecedented external deficits of the United States.

European Financial Markets and the Euro

Government bond markets, because of their sheer size, are a major component of the financial system. They provide liquid assets for investors to park their funds temporarily.

Government Bond Markets

The spreads of euro area 10-year government bonds versus the German Bund have fallen since the birth of the euro and are now at very low levels. In February 2004, the Austrian bond was trading at 3 basis points above the Bund; the French bond at 2 basis points; the Finnish bond at -2 basis points; the Dutch bond at 0 basis points; and the Italian bond at +14 basis points. Because currency risk is now absent and since there are few reasons to believe that default risks have changed much during the past five years (if anything, they should have increased following the recent breakup of the Stability and Growth Pact!), this suggests that the liquidity risk in those markets has been falling.

There is now as well some evidence that market participants have been coordinating with respect to some key securities, which have become benchmark securities for the government bond market. These are the German Bund at 10 years, the French bond at 5 years, and the Italian bond at 2 years. The existence of such benchmark securities facilitates the process of price discovery and the functioning of markets (see Dunne, Moore, and Portes 2003).

Corporate Bond Markets

Corporate bond markets were almost nonexistent for European nonfinancial institutions in 1998. So were markets for “junk” bonds. These markets emerged as the pool of potential investors increased following the adoption of the euro. But corporate bond markets as a whole underwent a substantial development. Total corporate sector issuances in the euro area amounted to €140 billion in 1999. They increased to €201 billion in 2001, fell back to €118 billion in 2002, and rebounded to €150 billion in 2003.

The Derivatives Market

The euro swap market was at the beginning of 2003 the largest financial market in the world with more than €26 trillion outstanding, just above the dollar swap market.

Equity Markets

European equity markets have traditionally been quite segmented. The advent of the euro seems to have fostered a greater degree of financial integration. The degree of correlation between equity price indices in the major euro area markets has kept on increasing (but it has been doing so ever since the beginning of the 1990s). More strikingly, the share of equities invested in Europe-wide funds has gone up substantially in euro area countries to reach nearly 50 percent. A similar increase has not been observed for the countries that have chosen to remain outside the euro area (Denmark, the United Kingdom, and Switzerland).

Summary

Euro area financial markets have therefore become more liquid, more diverse, and more integrated since the birth of the euro. We now turn to the international side and ask whether the euro has taken on any significant international currency role.

The International Role of the Euro

Foreign exchange trading in euros as a percentage of global trade has not increased compared with the share of European Monetary System (EMS) currencies. In 1998, the dollar was present 87.3 percent of the time at one end of a transaction on the foreign exchange market while the EMS cur-

rencies were present 52.5 percent of the time (note that the shares sum to 200 percent because transactions involved pairs of currencies). In 2001, the share of the dollar was 90.4 percent and the share of the euro was a mere 37.6 percent. All the intra-European trades have been netted out with the arrival of the euro, so in fact there has been no dramatic fall in the share of the euro compared with the share of EMS currencies—but there has been no increase either. Similarly, though the share of the euro in reserves has been gradually increasing over time, it amounted to only 18.7 percent of total reserves in 2002 compared with 64.5 percent for the dollar.

The role of the euro for international trade in goods (i.e., the invoicing currency) has also markedly increased but is still below the dollar's level. For example, in 2002, 55.3 percent of French export goods were invoiced in euros. The comparable number was only 48 percent in 2000. Similarly, only 35 percent of French imports were invoiced in euros in 2000. In 2002, 46.8 percent were. As regional integration has been proceeding in Europe, the share of exports and imports invoiced and settled in euros has increased to approximately 60 to 80 percent for countries that acceded to the European Union in May 2004 (Cyprus, the Czech Republic, Hungary, Latvia, Estonia, Lithuania, Malta, Slovakia, Slovenia, and Poland).

But it is in the realm of international debt issuance that the euro has taken on more clearly an international role. The stock of international debt denominated in euros (excluding home-country issuance) rose from below 20 percent at then end of 1998 to just above 30 percent at the beginning of 2003. There are therefore clear signs of the gradual internationalization of the euro on international capital markets.

The First Five Years

The euro has successfully completed its first five years of existence. It has triggered important changes in European financial markets. It has also established itself immediately as the second most important currency in the world and as a potential competitor for the dollar. It has not, however, displaced in any significant way the dollar as the currency of choice for most international transactions and as a reserve currency. The main reason for this is the inherent inertia of the international monetary system (see Krugman 1984, Rey 2001).

Once a currency like the dollar is at the center of the system, it is very difficult for other currencies to compete with the incumbent because no economic agents find it desirable to use a currency different from the one that everyone else is using. It took a long time before the pound lost ground as an international currency and was replaced by the dollar,

which had become a credible alternative over the years as the United States grew to become the biggest economy in the world (and the biggest exporter and importer). The dramatic change from the pound to the dollar occurred only after two world wars, after the stability of the pound had been significantly undermined, after the United Kingdom's importance in the world economy diminished, after New York's financial markets developed sufficiently to rival London's, and after the establishment of Bretton Woods.

Scenario for the Future

The euro has become a credible alternative to the dollar, given the size of the euro area economy in the world, and its active trade links with other areas. The European Central Bank has also established the reputation of the euro as a stable currency. But the United States is still the largest economic power in the world (unlike the United Kingdom after World War II). Hence there are reasons to believe that the future of the dollar as the main international currency is not threatened.

There are, however, also some elements pointing toward a potential shift in the relative importance of the euro and the dollar in the world economy. The United States has been running very substantial current account deficits in the past two decades. It has gone from a net creditor to a net debtor position, crossing the zero line around 1986. With US current account deficits now reaching 5 to 6 percent of GDP, a process of adjustment toward external solvency will have to come about. This adjustment will occur in particular through a substantial depreciation of the dollar (see Gourinchas and Rey 2004), which will both stimulate US exports in the long run but also impose sizable capital losses on foreign holders of US assets in the short to medium runs.

This very instability of the dollar, though necessary to restore the long-run external solvency of the US economy, may trigger portfolio shifts out of the dollar into the euro and other currencies, further undermining the stability of the dollar. The key question is therefore whether international investors will still accept taking capital losses on their dollar holdings and keep financing the US current account deficits at a low cost to the United States, as they currently do, or whether they will shift their wealth toward more stable nominal assets. In 2003 and 2004, most of the capital flows financing the deficits have come from Asian central banks accumulating liquid dollar assets as reserves to limit the appreciation of their currency vis-à-vis the dollar. Private flows into the United States have become scarcer. But international investor decisions have proven difficult to foresee, and at this stage it would be quite hazardous to make a definite prediction.

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Financial Architecture of the Eurozone at Five

GARRY SCHINASI

The role of any currency in international finance reflects the confidence with which it is perceived as a reliably liquid instrument for financial transactions and as a store of value. This confidence must be earned and depends importantly, though not exclusively, on the depth, liquidity, and efficiency of the currency's home or domestic markets and on the array of liquid portfolio investment opportunities in those markets.

The euro area is still developing pan-European markets and is likewise in the process of earning confidence. The dollar already enjoys the confidence of international markets. In this regard, it is unreasonable to assume that the euro and the dollar are competing on equal terms: The dollar has the distinct advantage of having been there first and having gained substantial credibility. It has also demonstrated an ability to sustain this credibility even through some fairly trying times.

Overall, given the head start the dollar has had, I would judge the euro as performing remarkably well in international finance at the young age of five years. It is also fair to say that it has a long way to go before it reaches its full potential, both domestically and internationally.

The euro's role as an international vehicle for finance will grow as Europe develops a full array of deep, liquid, and efficient financial markets, extending well beyond its integrated money markets. So what will it take to further develop the depth and liquidity of Europe's markets?

For four aspects of financial architecture—the plumbing of financial markets—there are still important challenges. The first two, namely, *financial infrastructure* and *regulation*, have more to do with the effective-

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ness of markets; the second two have more to do with the financial-sector policy apparatus—namely, *prevention* of financial problems and *resolution* of them. Overcoming these challenges in a politically unified Europe would be difficult enough, but European policymakers do not have this convenience.

Financial Infrastructure

With regard to the financial infrastructure, given the observations in the other financially focused chapters in this volume, a simple example will suffice. Before the introduction of the euro, European markets had 31 systems for clearing and settling securities transactions. They also had 25 derivatives exchanges, 20 derivatives clearinghouses, and 15 stock exchanges. Markets were national, each one had a currency, and each nation needed its own system, either run by the government or sanctioned and regulated by it.

Five years after the introduction of the euro, progress has been made in reducing these redundancies, but the euro area still has too many such systems based on national needs rather than European needs. Having to deal with all these systems for clearing and settling securities transactions—mostly involving safe government securities—is very costly, cumbersome, and fraught with differences in accounting, other conventions, and business practices. It also strains liquidity management. There has been progress, but not enough, and this is holding back market integration.

Regulations

Regulations lay out the rules of the game of finance in markets. In the United States, financial regulation is primarily, if not exclusively, the purview of the federal government. There is a uniformity of rules, standards, business practices, and so on for issuing and trading securities, and there is the infrastructure to facilitate this activity that is so vital to the securitized form of finance that takes place in US markets.

The same cannot be said for Europe. Indeed, the opposite is true. There is a lack of uniformity and in fact a largely national orientation to securities regulation. Baron Lamfalussy and his committee have established a process whereby Europe can achieve significant convergence in securities, banking, and even insurance: the Financial Sector Action Plan. The committee was formed to come up with a procedure, and it did, albeit a very complicated and cumbersome one. But it did not have the mandate to examine the scope of each of these important areas requiring regulations. And not all national authorities agree on the procedures.

Crisis Prevention and Resolution

Turning to the prevention and resolution of problems, confidence in a financial system depends in part on perceptions about the ability of the system to withstand problems and resolve them quickly with minimum cost. Europe is still a bank-dominated financial system, so banking supervision is a vital component of crisis prevention.

Prevention

The present approach to banking supervision in Europe reflects three principles inherited from pre-euro Europe: decentralization, segmentation, and cooperation. The first means that the primary responsibility for supervision will remain at the national level, probably for both wholesale and retail institutions. The second means that separate supervisors (or departments within a single authority) are likely to remain for different types of financial institutions such as banks, securities firms, and insurance companies (leaving pension funds aside). The third means that cross-border and cross-sector gaps will have to be handled through closer cooperation between national authorities.

Decentralization, segmentation, and cooperation may work well in Europe, but this still remains to be seen. After all, one can say that the US architecture for financial supervision is even more complicated, multi-institutional, multijurisdictional, and segmented than it is in Europe. And it is at least a defensible statement that the United States has some of the most efficient and effective financial institutions in the world. I would even go further and say that US supervision of financial institutions has been effective overall.

But there are two fundamental differences between Europe's and the United States' architectures for financial supervision and how they work in practice. First, although there is some risk in the US system that a state supervisor would focus on the state's needs rather than the nation's, this is unlikely. If push comes to shove, the disparate parts of the US architecture have tended to focus on the nation's interest if this is what is required, especially because there is a sharing of responsibilities between federal and state regulators.

It is less obvious that national supervision in Europe would tend, as a first priority, to focus on European priorities. After all, there are still different national interests, treasuries, taxpayers, and even laws. And no arrangements for sharing responsibilities and authority for supervision are spelled out in the law or Maastricht Treaty. Cooperation may work smoothly in normal periods of financial activity. But when a large financial institution—with significant cross-border business and exposures—

licensed in one European country is having difficulties, it is difficult to imagine the national supervisor pursuing European interests first and national interests second. In short, there is a strong risk that a propensity to protect national institutions will endure, just as there has tended to be interest in producing national champions before mergers and acquisitions involving foreign institutions.

Second, despite the fragmentation of US supervision, there is a strong and unambiguous supervisor for the banking parts of very large financial holding companies. These holding companies make up the core of the US financial system, in terms of both the payments mechanisms and of providing market-making and liquidity services across the US financial system (and economy and even the global financial system). By payments mechanisms, I include those outside the official payments mechanism Fed Wire, such as CHIPs, and the less formal but perhaps equally important over-the-counter derivatives markets. This supervisor—the US Federal Reserve System—has had its authority over the large institutions solidified if not bolstered by the Gramm-Leach-Bliley Act. There is as yet no such supervisor in the euro zone overseeing the European equivalent of the major European financial institutions.

Resolution

Turning to the last area, the resolution of problems: Crisis management mechanisms are somewhat clearer in Europe today than they were five years ago. But they are still not clear enough to satisfy doubtful international market participants and other outsiders. In particular, it is not clear how a crisis involving a pan-European bank or one occurring across pan-European markets would be handled.

Let me illustrate this ambiguity, which does not appear to be constructive. The European System of Central Banks (ESCB) is entrusted with the “smooth operation of the payments system.” In the specific case of a gridlock in the pan-European payments system TARGET, the Maastricht Treaty, which includes the statute establishing the ESCB, implies that the European Central Bank (ECB) has competence to act as lender of last resort.

What does the treaty imply if crisis does not originate in TARGET? It is not clear.

According to at least one legal scholar in Europe, the treaty is silent about whether the ECB has competence to act as lender of last resort (LOLR) (see Lastra 2003). According to Rosa Lastra, some have interpreted this silence as an indication that there is scope to enhance the ECB’s authority in this area. Opposing this view, others see silence as an indication that the authority remains where it was before the treaty, namely, with national authorities. Still a third interpretation is that along with other ambi-

guities in the treaty, the subsidiary principle leaves open the possibility for a European Community competence, which could be exercised directly by the ECB or by the national central banks in their capacity as operational arms of the ESCB. Or perhaps it leaves open the door for some other European institution; it is just not clear.

Some see this ambiguity as constructive, which admittedly is desirable if it is confined to ambiguity about the conditions under which LOLR assistance would be appropriate. But this is not the kind of ambiguity in the treaty. Instead, this ambiguity seems to be about who does what or who has the authority.

There probably are informal, and perhaps even formal, written arrangements about who does what. But unless the markets have confidence that these mechanisms exist and that responsibilities are well defined and can be carried out effectively, they may count for naught in building confidence and establishing credibility in this important policy dimension.

In the case of a general drying up of liquidity related to market developments or an unanticipated shock, the treaty is probably sufficiently silent that the ECB could act through its "market operations approach" and supply liquidity to the markets. But how does it go about distinguishing liquidity from solvency problems when it does not have immediate, independent access to information about the creditworthiness of the major financial institutions, be they of German, Italian, or French nationality?¹⁴

Looking to the Future

These are some of the remaining but not insurmountable challenges. Overall, there should be little doubt that the euro is a major currency and a major force in international finance, second only to the dollar.

However, it is difficult to see the euro progressing much further without more improvement in each of these areas. First and foremost, this would entail increasing the depth, liquidity, transparency, and integration of European financial markets, which is a necessary condition for further progress internationally. Improving markets would, in my view, also facilitate a more rapid rationalization and consolidation of financial institutions in Europe, which is also needed for capturing the remaining and sizable potential efficiency gains of the European Union.

I do not expect progress to be very rapid. All the challenges outlined here have existed since 1999 when the euro was introduced. Progress has been made in each area. But it has not been rapid, and it has not been sufficient to enable the euro to reach its full potential to either catalyze the

14. For two distinct but related discussions of the role of central banks in ensuring financial stability see Schinasi (2003) and Padoa-Schioppa (2003).

creation of deep, liquid, and efficient pan-European markets or serve as an international vehicle for finance.

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