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European banking after EMU



European Investment Bank

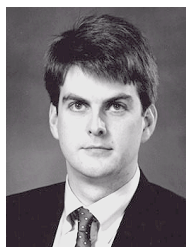
# Contents

- 4** Preface by Sir Brian Unwin, President

## **European banking after EMU**

- 7** Introduction by Christopher Hurst and Rien Wagenvoort
- Martin Brookes **19** The impact of EMU on portfolio management
- Graham Bishop **35** New capital market opportunities in Euroland
- Colin Mayer **47** European capital markets: Competition between systems
- Luigi Spaventa **59** Comments on the future of EU capital markets
- Daniel Gros & Karel Lannoo **61** The structure of financial systems and macro-economic instability
- Clas Wihlborg **71** Supervision of banks after EMU
- Christopher Hurst, Eric Perée & Mireille Fischbach **83** On the road to wonderland? Bank restructuring after EMU
- Rien Wagenvoort & Paul Schure **105** Who are Europe's efficient bankers?
- Philip Molyneux **127** Increasing concentration and competition in European banking: The end of anti-trust?
- Jean Dermine **137** The case for a European-wide strategy
- Ingo Walter **145** Financial services strategies in the euro-zone

# The impact of EMU on portfolio management



**Martin Brookes**

## 1. Introduction

A considerable amount has been written about the impact of EMU on European financial markets. A broad consensus has emerged from this work, with the main conclusions as follows:

- Government bond markets will be more closely integrated and yields closely correlated.
- Non-government borrowers will increasingly borrow directly from investors by issuing debt securities rather than borrowing from banks, leading to a US-style corporate bond market.
- The national bias in equity and fixed income investments will diminish and funds will be increasingly managed against Euro-wide benchmarks, possibly involving some reallocation of existing investments.
- Equity markets will grow as more companies go public and more investors seek to invest funds in equity markets.

There are a raft of additional conclusions which have emerged and some writers make greater claims than others. But the above are the core conclusions of research on EMU and financial markets.

This paper is not going to challenge this consensus. Instead it will highlight how EMU will change the behaviour of institutional investors, which is the key factor behind the expected changes to capital markets. It is useful to distinguish between factors influencing the supply of funds in different financial markets and factors influencing the demand for funds. The aggregate approach usually taken often does not make this distinction clear. Most papers look at the size of Euroland financial markets and the barriers to their development caused by having distinct currencies. We aim to ask why EMU is expected to lead investors to change the way that funds are managed, prompting the changes above.

The plan of the paper is as follows. The following section considers the impact of EMU on a fixed income fund manager - how does the introduction of the euro affect the behaviour of this fund manager and how does this affect the demand for new financial markets? Subsequent sections discuss equity markets and EMU. There is evidence that EMU is already changing investor behaviour and will do so further. We present evidence from a survey of investors managing over USD 2 500 billion of funds. After a discussion of investor behaviour the paper describes transitional issues in fixed income and equity markets caused by potential flows of funds between national financial markets and interest rate convergence.

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*This paper draws upon much existing research of colleagues at Goldman Sachs. In particular, the work of Kurt Winkelmann, Sandy Rattray, Mike Young, Peter Sullivan and Francesca Massone is used. I am grateful to Joshua Rauh for research assistance in preparing the paper.*

*Martin Brookes is Executive Director, International Economist at Goldman Sachs International, London. He has worked on economic issues relating to EMU, and on European fixed income markets. He was ranked top in Gilt research by Institutional Investor in its 1996 and 1997 surveys of European analysts.*

**EMU is expected to lead investors to change the way that funds are managed.**

The penultimate section describes the current state of financial markets within Euroland, comparing them with the US and Japan. This serves to emphasise that an important feature of discussions about Euroland financial markets is the size of the Euroland economy. We question whether financial markets within Euroland can realise their full potential and grow to match those in the US. Several barriers to integration remain as well as shortcomings in the regulatory environment. These are likely to remain for a considerable time, inhibiting the growth of Euroland financial markets. Nonetheless, the introduction of the euro paves the way for a substantial change in the way that investors in Euroland behave.

## **2. EMU and fixed income markets (1)**

### **2.1 Government bond markets in EMU**

The financial markets that have felt the impact of EMU most forcibly to date are the national government bond markets of countries joining the monetary union. A key concern of investors in these markets during the past three years has been the prospects for EMU going ahead and which countries would join any monetary union. Fluctuations in these prospects have been a prime factor in influencing bond yields. Now that EMU has begun, all new government debt of the 11 countries in Euroland will be issued in euro. In addition all governments are redenominating the vast majority of tradable government debt (2).

Therefore, there are now no remaining currency differences between (say) German and French government debt. Historically, foreign exchange risk between these currencies may have been low, but the different currency denominations of the two bonds made them distinct assets. Removing foreign exchange risk should increase the degree of substitutability and the correlations between bond markets of different governments. Indeed, EMU has already boosted correlations between returns in different markets.

An alternative way to make this same point is to use the expectation hypothesis of the term structure of interest rates. The current bond yield can be broken down into the current level of short-term interest rates and expectations of future interest rates. For example, today's two-year bond yield can be written as the average of the current one-year interest rate and the one-year interest rate expected in a year's time (3). Additional factors, such as the credit risk of the borrower and liquidity may also influence the current level of two-year bond yields, but this formula contains the dominant factor. Inside EMU market interest rates and expectations about future interest rates are determined by the monetary policies of the ECB. The dominant influence on government bond yields is therefore common across all government bond markets, making the markets more closely correlated. In the run-up to EMU, the anticipation of this drove actual bond yields close to one another through the convergence of forward interest rates implicit with current yields (see Figures 1 and 2).

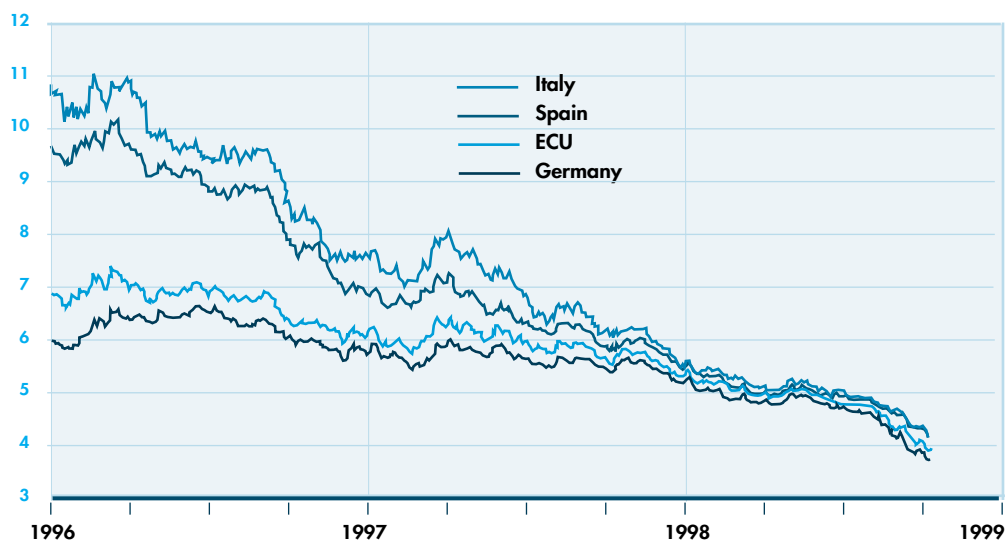
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1) This section draws on three papers by the author in Goldman Sachs European Economics Analyst. These are: "Portfolio Flows Between Government Bond Markets in EMU" of February 1998, "Credit Risk and Bond Yield Spreads Within EMU" of March 1997, and "Government Bond Markets in EMU - The Supply and Demand for Corporate Credit" (with Kurt Winkelmann) of March 1998.

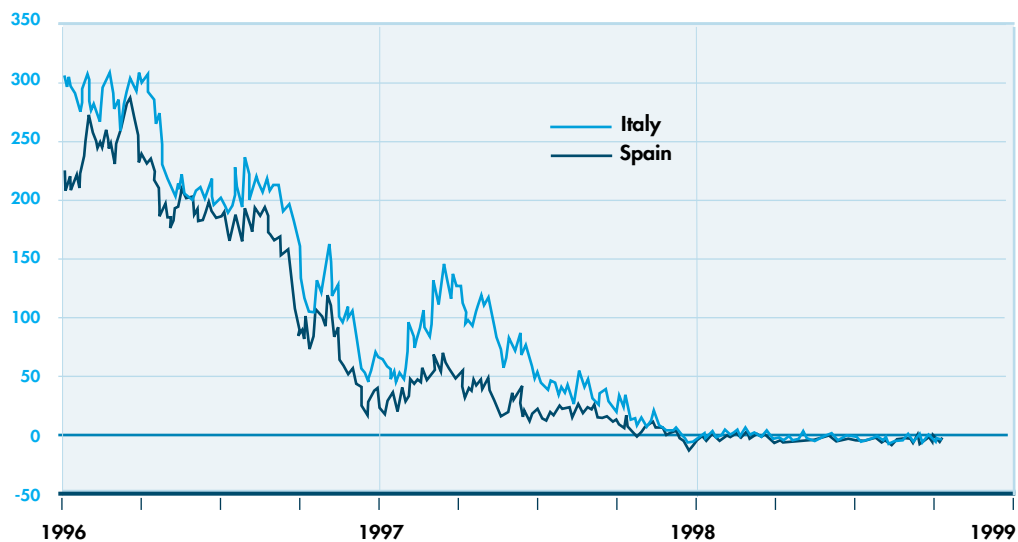
2) A report published in April by the EU monetary committee shows the share of tradable national currency government debt which is being re-denominated is over 80% for all countries joining EMU except Finland (77%) and Austria (34%).

3) This is a linear approximation rather than an exact formula, but it suffices for our purposes.

**Figure 1.** Benchmark government bond yields, percent



**Figure 2.** Five year, five year forward swap spreads over Germany, basis points



As well as removing currency distinctions, governments are taking steps to harmonise the conventions on different bond markets, e.g. the way that accrued interest is calculated and the settlement terms. This will remove another distinction between new issues of government debt, increasing the degree of substitutability yet further. However, some distinctions between different government bonds will remain. Two important distinctions will be issuance practice, which will remain the responsibility of national governments, and credit risk, with individual governments responsible for the consequences of their own fiscal actions. These factors are likely to prevent the different government bond markets being perfectly correlated with one another. Nonetheless, the impact of EMU on government bond markets will still be higher correlations. This will remove the differences between bond markets, which were a key part of the process of investing in these markets until recently. This could markedly change the way that fixed income funds are managed in Euroland.

**Higher correlations between national government bond markets reduce the benefits of diversification.**

## 2.2 Fixed income fund management in EMU

Higher correlations between national government bond markets reduce the benefits of diversification. For example, a French investor holding a portfolio of French government bonds could alter the volatility of his portfolio by shifting some funds into foreign currency government bonds, such as German Bunds. So long as the correlations between the two markets was low this would reduce the volatility of the overall portfolio without reducing returns. Switching bond holdings into other government debt was also a means of seeking higher returns on a portfolio.

Table 1 illustrates the impact of higher correlations on bond portfolios. It shows the tracking error on a portfolio of either French or German government bonds relative to a benchmark of all Euroland government bonds. These tracking errors are shown under different assumptions about the correlations between government bond markets in Europe. The correlations begin at zero and end at one, with perfect correlation between the national government bond markets. Intermediate values for the correlations are the actual correlations in January 1994, when EMU was an uncertain prospect, and January 1998, when the prospect of EMU had pushed correlations higher. The tracking error on a portfolio of purely French or German government bonds declines as the correlations increase from left to right. This is because the portfolio of French or German government bonds becomes a closer substitute for the aggregate Euroland portfolio. When bond markets are highly correlated the tracking errors are very small.

This shifts the focus of fixed income fund management within Europe. A traditional method of managing a fixed income portfolio of government bonds within Europe was to decide whether to increase allocations to certain European markets to try and boost returns. The choice of country was the main decision variable for a fund manager.

**Table 1.** Tracking errors decline as correlations increase

	Tracking Error (basis points)			
	Corr = 0.0	Corr: Jan 94	Corr: Jan 98	Corr = 1.0
France	305	191	150	15
Germany	260	197	129	47

Table 2 shows the change due to EMU most starkly. Imagine an investor managing a portfolio of European government bonds who is not allowed to take duration risk, that is, he has a "market exposure" of one. This investor has a target tracking error for his portfolio relative to the benchmark aggregate Euroland portfolio of 50bp. This represents his appetite for risk. The investor takes the risk by switching funds between different government bond markets, e.g. moving out of France and into Italy. If correlations between the government bond markets are in line with those in January 1994 it is possible to construct a portfolio which has a tracking error of 50bp and achieves an expected out-performance relative to the benchmark of 30bp. This represents the pay-off for assuming additional risk in the portfolio (4).

4) All these calculations are based on the Goldman Sachs Black-Litterman asset allocation model.

**Table 2.** Less opportunities to take risk

Portfolio	Market Exposure	Tracking Error (basis points)	Projected Performance (basis points)
Corr. Jan 94	1.00	50	30
Corr. Jan 98	1.00	37	7

If we use the higher correlations between the government bond markets of January 1998, the story changes. It is now not possible to construct a portfolio with 50bp of tracking error without taking duration risk. The different government bond markets are too close substitutes, and the maximum tracking error, which is possible, is 37bp. For this level of risk the expected out-performance relative to the benchmark portfolio is just 7bp.

*Inside EMU it is not possible to satisfy investors' typical appetites for risk by the normal process of switching between the different national government bond markets.*

Therefore, inside EMU it is not possible to satisfy investors' typical appetites for risk by the normal process of switching between the different national government bond markets. There are several possible responses - all involve taking on additional risk in at least one dimension. First, the investor actively managing a portfolio of European government bonds can manage the duration of the portfolio more aggressively than before. A second possibility is to change the parameters on the portfolio and manage the international exposure between the US, Europe and Japan more aggressively. The third option is to look elsewhere within European fixed income markets to find opportunities to take risks.

### **2.3 A Euroland corporate bond market**

Investors seeking new fixed income opportunities to boost returns on bond portfolios will add to the demand for corporate credit inside EMU. This has already happened to some extent, but the process is likely to intensify. First, correlations of returns on government bonds should increase further between much of the EMU bloc. Second, unfunded pension liabilities and pension provision in the private sector will push fund managers into seeking higher returns on existing portfolios of pension assets. This will necessarily entail higher risk, partly in the form of greater credit risk. Third, the supply of government bonds may diminish as governments keep fiscal deficits low in line with the stability and growth pact, reducing further the available returns on portfolios of government bonds.

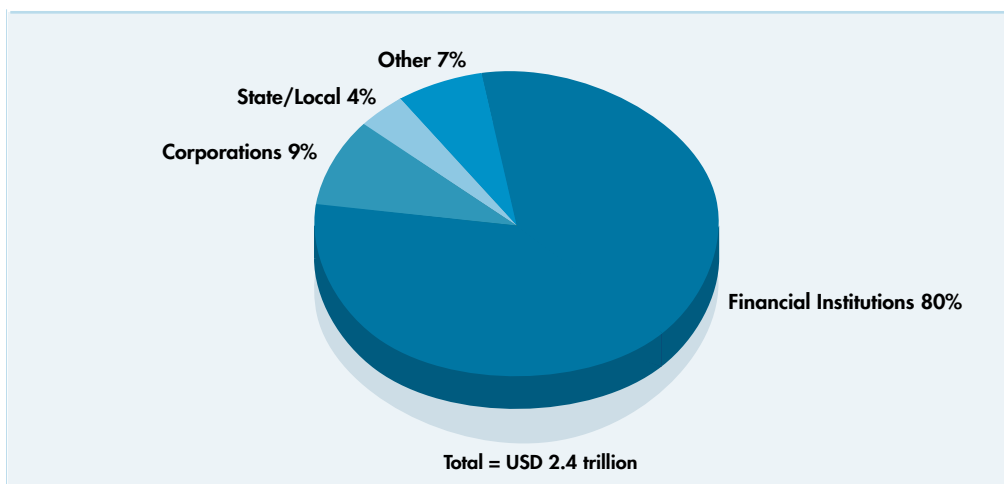
A final impact is through increased opportunities for diversification. By broadening the universe of domestic currency corporate bonds, EMU will increase the scope to diversify away any individual corporate credit risk. This increases the attractiveness of investing in a given corporate credit. The demand for a given corporate credit therefore increases at unchanged spreads - i.e. the demand curve shifts rightwards.

An increased demand for credit risk will also reduce the corporate credit spread over government debt. This will boost the overall supply of corporate debt and will go some way to restoring the opportunities to take risk and increase returns on fixed income portfolios in Europe. However, the total corporate bond market in Euroland is currently woefully small (see Figure 3). Data from the IMF show that two thirds of every dollar raised by US companies comes directly from the capital

*Investors seeking to boost returns on bond portfolios will add to the demand for corporate credit inside EMU.*

markets with the remainder coming from bank borrowing. The balance is exactly reversed in Europe - two thirds of borrowing comes from banks and only one third direct from capital markets. Moreover, most of the borrowing in capital markets is done by financial institutions. There is very little direct borrowing by non-financial institutions to finance their activities.

**Figure 3.** The corporate bond market in EMU



One of the factors which has inhibited the development of a corporate bond market is exchange rate risk. Due to restrictions on investments in foreign currency assets, the possible range of investors for most companies has effectively been limited to domestic investors. This has raised the cost of issuing debt securities for most companies relative to the alternative of borrowing directly from the banking sector. EMU should broaden the investor base for European companies wishing to issue corporate debt. In addition the foreign exchange cost of issuing debt in one main currency and then transferring the proceeds into various different local currencies to finance local operations will disappear. These factors should boost the supply of corporate credit independently of the increase in demand.

An increase in both the demand for corporate credit and also the supply of corporate credit will foster the development of a corporate bond market. Back of the envelope calculations suggest that this market could grow fivefold or more from its current anaemic state. The main consequence of EMU for fixed income investors is, therefore, a shift in focus from the national economic policies of individual governments towards corporate credit.

### **3. EMU and equity markets**

#### **3.1 Sector versus country**

There is considerable evidence that investors in financial markets have a strong domestic bias. Many studies show that the proportion of assets held domestically is suboptimal and that a shift of some funds into overseas assets would reduce the volatility of portfolio returns without reducing the level of returns. One of the barriers to such diversification of portfolios is exchange rate risk. Investors are either wary of shifting funds into overseas markets because of exchange rate risk or are prevented from doing so by regulations which are themselves justified by exchange rate risk.



As noted above, EMU changes the definition of the home market, and should reinforce the move from managing portfolios of European equities along national lines towards sectoral lines. Equity market strategists and academic researchers continue to debate the merits of distinguishing equity markets along national or sectoral lines for investment purposes. The issue here is whether (for example) an investor should compare the share prices of German banks with the share prices of other German companies or with those of banks in other European countries.

EMU has led to increased stability in exchange rates and convergence of bond yields and interest rates in the countries joining the monetary union. In principle this might have increased the correlations between national equity markets as the determinants of corporate profits and risk premia move more closely. Simultaneously, one might expect correlations between equity prices within the same sector to increase as European economies become more integrated and trade flows between European countries increase.

**Sectors have become relatively more important in determining equity returns than countries.**

Research by Goldman Sachs suggests that sectors have indeed become relatively more important in determining equity returns than countries (5). This research looks at average historic correlations between equity returns within national equity markets and within sectors. Although there is no conclusive increase in correlations within sectors during recent years there has been a decline in correlations within national markets. However, the evidence remains ambiguous as to whether sectors or countries have proved better asset classes. Nonetheless, the research concludes: *"from a European perspective, and more specifically from the perspective of EMU, it seems likely that the ability of any analytical system to generate country rotation signals within Europe will fall as interest rate and exchange rate changes among countries included in EMU fade into history. Even if the sector signals do not improve, this suggests an increase in the relative ability of sectors to contribute to the investment decision process. ... we believe investors have a basis to assume that sectors will be better asset classes going forward"*.

Ultimately the question of whether investors will look at sectors or countries when making investment decisions is empirical, and survey evidence strongly indicates that investors will base their decisions on sectors rather than countries. Together with the investment consultants Watson Wyatt, Goldman Sachs undertook a survey of our client base asking about the impact of EMU on behaviour (6). The aggregate value of funds under management covered by the survey was approximately USD 2 700 billion.

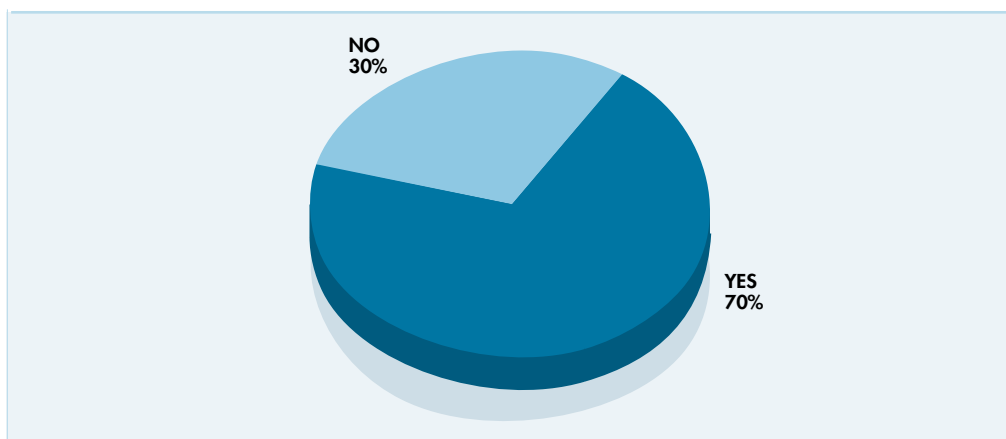
The results are shown in Figure 4. Out of the fund managers surveyed, a full 70% said that EMU would lead them to reconsider their approach to asset allocation. The fund managers were asked whether they would organise their European equity portfolio on a country or a sector basis. 64% of managers said that European equity portfolios would be organised on a sector basis. Only 9% said that portfolios would be organised on a country basis, the remaining 27% saying "other", probably indicating a mixture of country and sector factors. Linked to this finding there is strong evidence from the survey that fund managers increasingly find the country of listing of a company within Euroland to be irrelevant.

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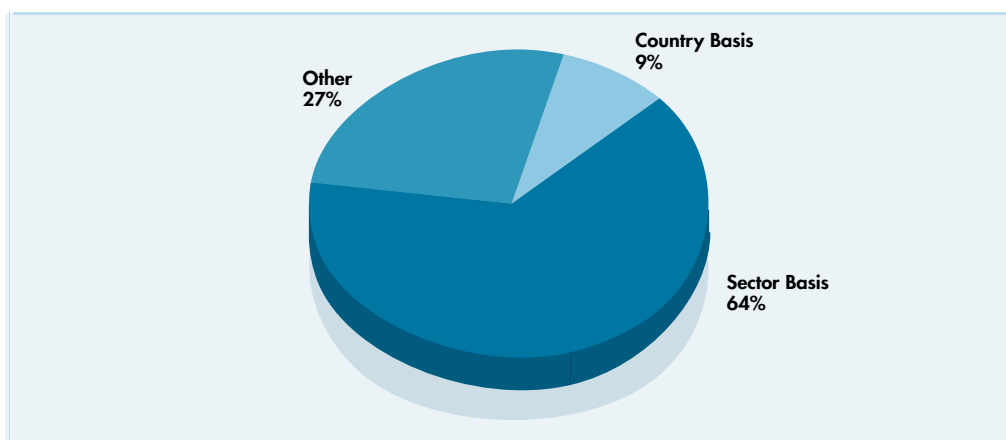
5) "Sector Versus Country - When is an Asset Class an Asset Class?". Goldman Sachs Portfolio Strategy, March 1998.

6) "The Goldman Sachs/Watson Wyatt EMU Survey - Summary of Results", Sandy Rattray & Richard Boomgaardt, Goldman Sachs Equity Derivatives Research, 17 June 1998.

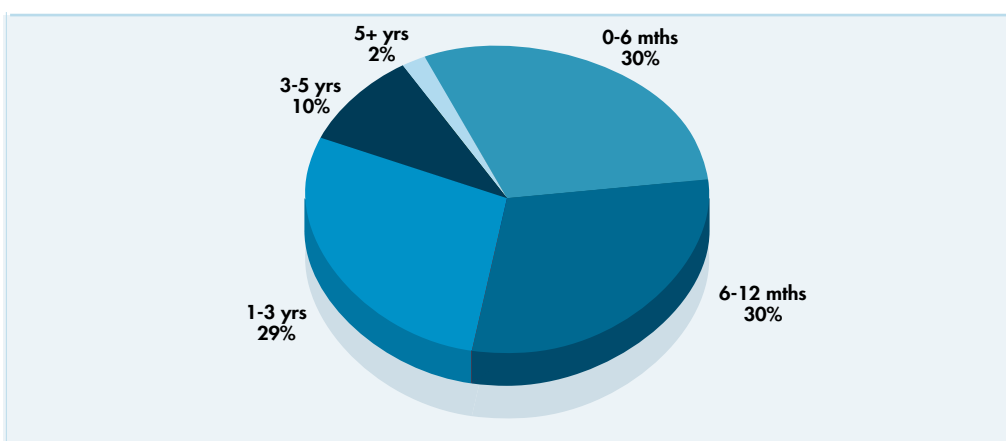
**Figure 4.** The Goldman Sachs/Watson Wyatt EMU Survey



Will the establishment of the euro prompt you to reconsider your asset allocation?



Post EMU will your European equity portfolio be organised on a country or sector basis?



How long do you expect transition from your current portfolio to your "EMU compatible" portfolio to take?

One factor, which might stimulate change in the way funds are managed, is changing regulations. EU based insurance companies are covered by the EU Third Life Insurance Directive which is reflected in national law in each country. This directive requires insurance companies to hold at least 80% of their assets in the same currency as their liability. This forces insurance companies to hold the bulk of their equity portfolios in domestic equities. Now that EMU has begun, this effectively removes the restriction on investing in equity markets in other countries within the monetary union.

There is no common framework of regulation for pension funds and attempts by the European Commission to propose a framework continue to face opposition by individual countries. The impact of EMU on restrictions on pension fund investment is, therefore, less clear. However, it is expected that EMU will ease restrictions on pension fund foreign holdings by redefining the "home" market, for example through changing the results of asset-liability studies.

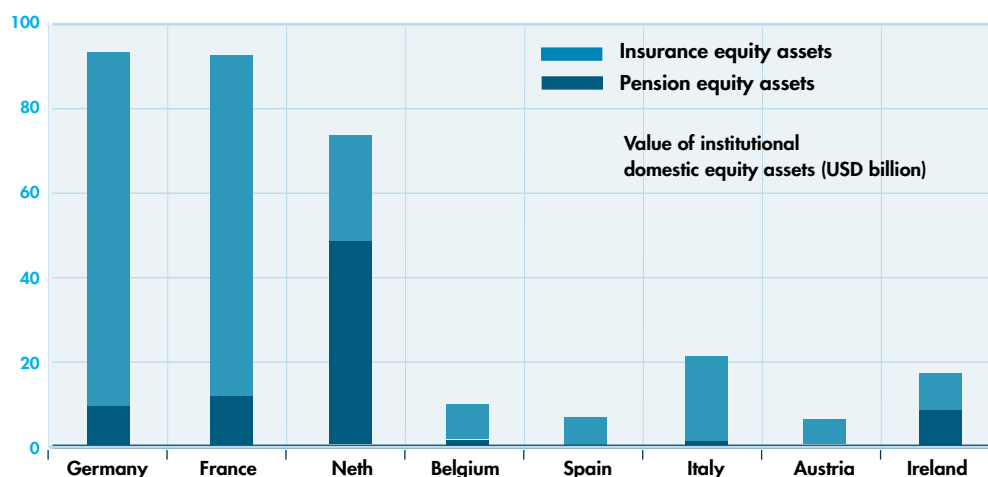
One interesting feature of the survey was the speed with which changes are likely to be implemented. Almost 60% of fund managers expected the transition period to take no more than one year and almost 90% expected it to be finished three years into EMU. This suggests a fairly rapid adjustment to equity portfolios. It is possible that this might cause some dislocation in some national equity markets as funds migrate from national portfolios into pan-Euroland portfolios. This is one of the transitional issues for EMU discussed below.

### 3.2 Portfolio rebalancing

*Concentration of institutional holdings of equities in particular countries has raised the possibility of massive net flows between some markets.*

The prospect that equity investors might adjust their portfolios fairly rapidly has led to some speculation about the extent of cross-border flows. In principle these flows might be substantial. If investors in each national equity market decide to adjust their portfolios into pan-Euroland portfolios the majority of funds under management could change hands. Institutional holders of equities are more likely to adjust their portfolios than individual investors. The concentration of institutional holdings of equities in particular countries, most notably in Dutch pension funds and German and French insurance companies (see Figure 5), has raised the possibility of massive net flows between some markets.

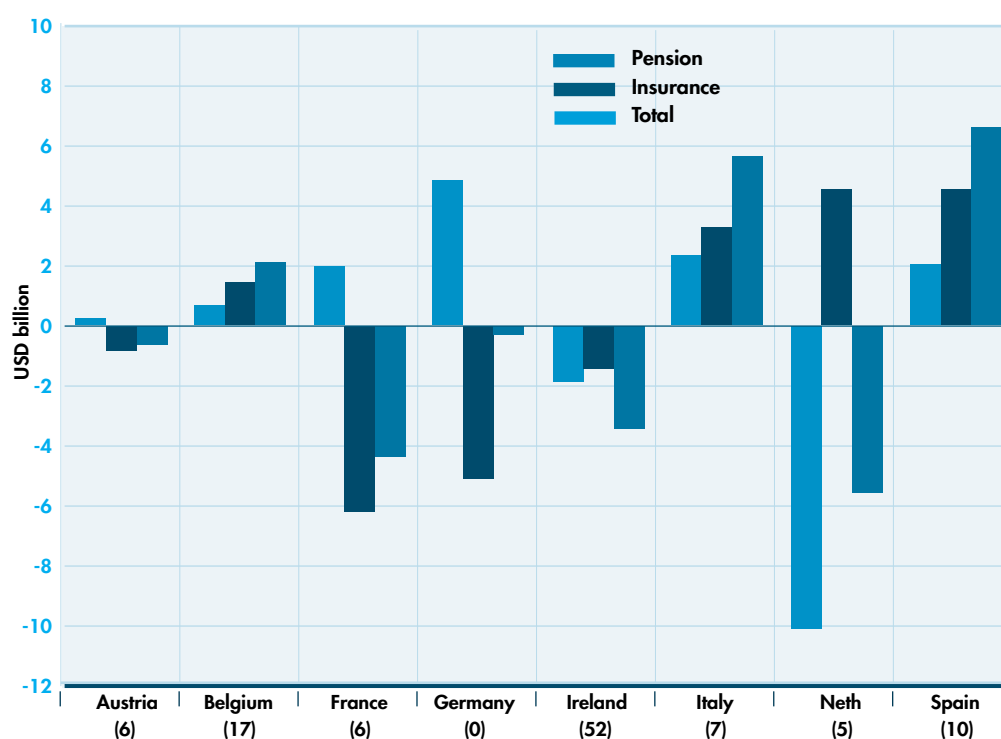
**Figure 5.** EMU zone domestic equity assets



Two distinct approaches can be taken to portfolio rebalancing (7). First, one can consider rebalancing using a country approach. This would involve selling domestic equity holdings and investing the proceeds across the euro-zone on a country basis. With such an approach, those markets with the highest level of institutional equity investment relative to their weight in the euro-zone would suffer most. There would be massive flows of funds out of the Dutch and French equity markets and into Spain and Italy. There would also be large selling of Irish equities. Figure 6 shows the net rebalancing flows and also the number of days trading volume assuming that 30% of portfolios are adjusted. Flows from insurance companies and pension funds are shown separately as pension funds may rebalance more slowly than insurance companies owing to the differences in regulation.

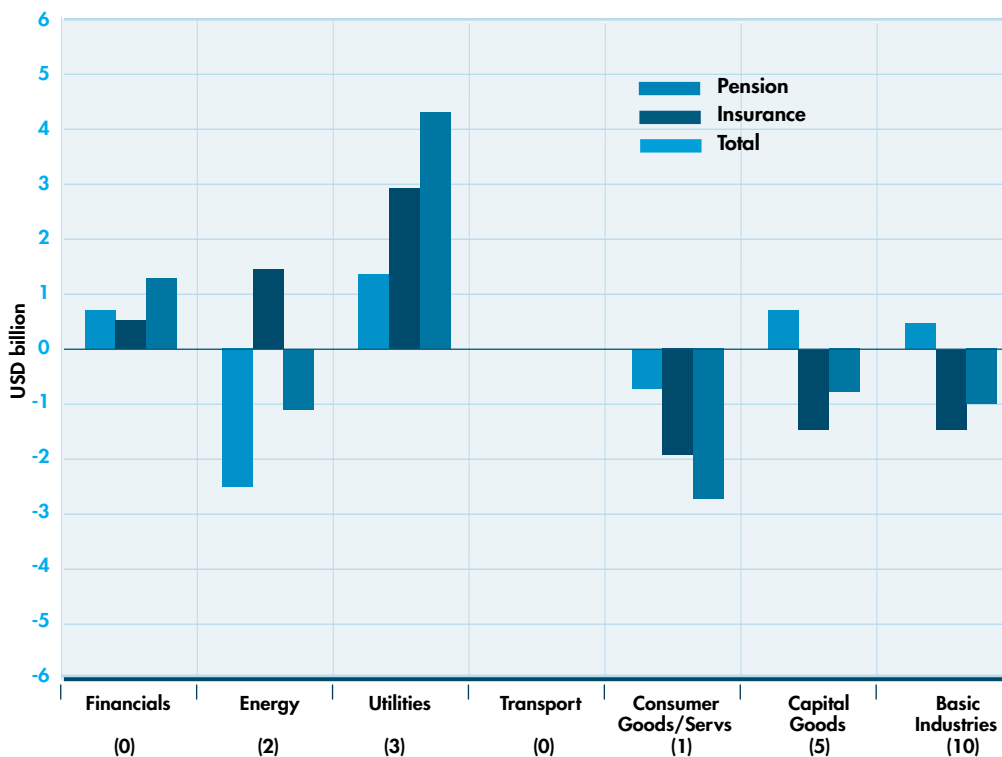
The alternative approach to portfolio rebalancing is to do it along sector lines. Country of portfolio holding is irrelevant here - one is only interested in whether sector holdings match the sector breakdown of the aggregate euro-zone equity index. Consequently, institutional investors remain biased on a country basis after rebalancing. Given the stated preference of equity fund managers for managing portfolios along sector lines inside EMU, this seems a more realistic approach to take. Figure 7 shows the net portfolio flows assuming 30% of funds are reallocated on a sector basis across the Euroland equity market. The flows are more muted than for a reallocation along country lines. This is because existing allocations of funds look less unbalanced when measured against a neutral sector benchmark. Moreover, on sector lines there are more flows which cancel out.

**Figure 6.** Rebalancing flows using a country approach



7) The following draws on "The Great European Rebalancing: Fact or Fiction?". Sandy Rattray, Goldman Sachs Equity Derivatives Research, 16 May 1998.

**Figure 7.** Rebalancing flows using a sector approach



*Cross-border equity flows due to rebalancing may be skewed towards "large-cap" names.*

The aggregate effect of portfolio rebalancing in equity markets may therefore be more limited than is widely thought. However, one feature of these potential flows is particularly worth noting. Typically, when investors rebalance portfolios they concentrate new purchases on "large-cap" names. This suggests that cross-border equity flows, which result from rebalancing, may be skewed towards these stocks. One factor reinforcing this is that the most widely used benchmarks for pan-Euroland equity investors are likely to be "large-cap" biased. Investors will therefore have an added incentive to concentrate purchases in these stocks. The rebalancing effect within equity markets may have the most marked effect on stocks of different market capitalisations within the same sectors rather than on different countries or sectors (8).

#### 4. A logical end-point?

Table 3 compares Euroland with the US. It is common to use the US economy as the benchmark for comparison for Euroland because the two are not so different in terms of economic size (Euroland GDP is roughly three-quarters US GDP). Some of the arguments about the future development of Euroland financial markets stem from this fact alone. To illustrate this point, imagine that EMU did not involve 11 EU countries together, but instead economies the size of the 16 German Länder

8) It is possible that there will also be rebalancing flows within bond markets. However, correlations between different government bond markets are very high and the diversification benefits from switching between different markets will be low. Perhaps the most compelling argument in favour of diversification comes from prudential considerations, i.e. to avoid excessive exposure to the credit risk of the home government. Nonetheless, the force of this argument is fairly limited and diversification of bond portfolios may be slow and protracted. See "Portfolio Flows Between Government Bond Markets in EMU", Martin Brookes, Goldman Sachs European Economics Analyst, February 1998.

(coming together to yield the DEM). The key part of this process is exactly the same, i.e., economic areas adopting a common currency. But it is difficult to imagine analysts making the same claims about the future development of DEM-denominated financial markets, which are made about euro-denominated financial markets. The qualitative claims which would be made may well be similar - greater liquidity and depth in financial markets leading to greater range of instruments and markets - but the range of instruments and markets expected to develop would be smaller than is the case for Euroland.

**Table 3.** Euroland comes close to matching the US

	Euroland	USA
GDP	USD 6.8 trillion	USD 7.6 trillion
Population	288m	261m
Share of World Trade	18.6%	16.1%
Government Bond Market	USD 2.3 trillion	USD 2.2 trillion
Equity Market	USD 2.6 trillion	USD 8.4 trillion

**Two key barriers are the lack of a common Euroland regime for the tax treatment of investors and the lack of a common accounting standard.**

However, there are many barriers to Euroland developing financial markets and a fund management industry to match the US. The size of the economy is not everything. Two key factors are the lack of a common Euroland regime for the tax treatment for investors and the lack of a common accounting standard (9). Although some governments have expressed an interest in harmonising taxation policies, progress is likely to be slow. The role of accounting policies inhibiting the growth of European financial markets was highlighted by the listing of Daimler Benz on the New York Stock Exchange. In order to comply with NYSE listing rules Daimler Benz had to adopt US GAAP (Generally Accepted Accounting Principles). These led to markedly different results from those produced under German accounting rules. Progress is likely to be made in integrating accounting systems within Euroland, but again progress will probably be slow.

These factors will inhibit the growth of financial markets in EMU and will likely detract from international investor involvement in these markets. Consequently, the size of financial markets within the US is probably an exaggerated end-point for Euroland. A further factor that could inhibit the growth of financial markets is the legal framework protecting shareholder rights in Europe. Recent research highlights the role of investor protection in promoting or restricting the growth of capital markets. For example, La Porta *et al.*, examines the links between four measures of the development of financial markets and a quantitative measure of the extent of investor protection (10). The measures of financial market are stock market capitalisation, the number of listed companies per head of population, the number of initial public offerings of shares (IPOs) and a

9) "Capital Markets and EMU", Report of a CEPS Working Party, Centre for European Policy Studies, 1998.

10) La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. (1997). "Legal determinants of external finance". Journal of Finance, July.

measure of debt finance. The hypothesis is that investors are more likely to provide funds if the legal system provides adequate protection for their investments.

The evidence suggests those countries with common law legal systems, such as the US and UK, provide greatest investor protection and also support the most developed equity markets. Countries governed by French civil law systems, such as France, Italy, Spain, the Netherlands and Belgium among the Euroland countries, provide the weakest investor protection and support the smallest equity markets. Countries with German and Scandinavian origin legal systems lie between these two extremes and in turn support medium sized financial markets.

***It is excessively optimistic to assume that the logical end-point are markets of the size and breadth of the US financial system.***

This line of research is still relatively new. But the results to date highlight a further drawback for the potential growth of financial markets within Euroland. Euroland countries are covered by legal systems which do not provide the same extent of legal protection, as does the US. Therefore, it is probably excessively optimistic to assume that the logical end-point for European financial markets is the size and breadth of the US financial system. The differences between the two are much more than the exchange rate differences preventing the exploitation of economies of scale within Europe.

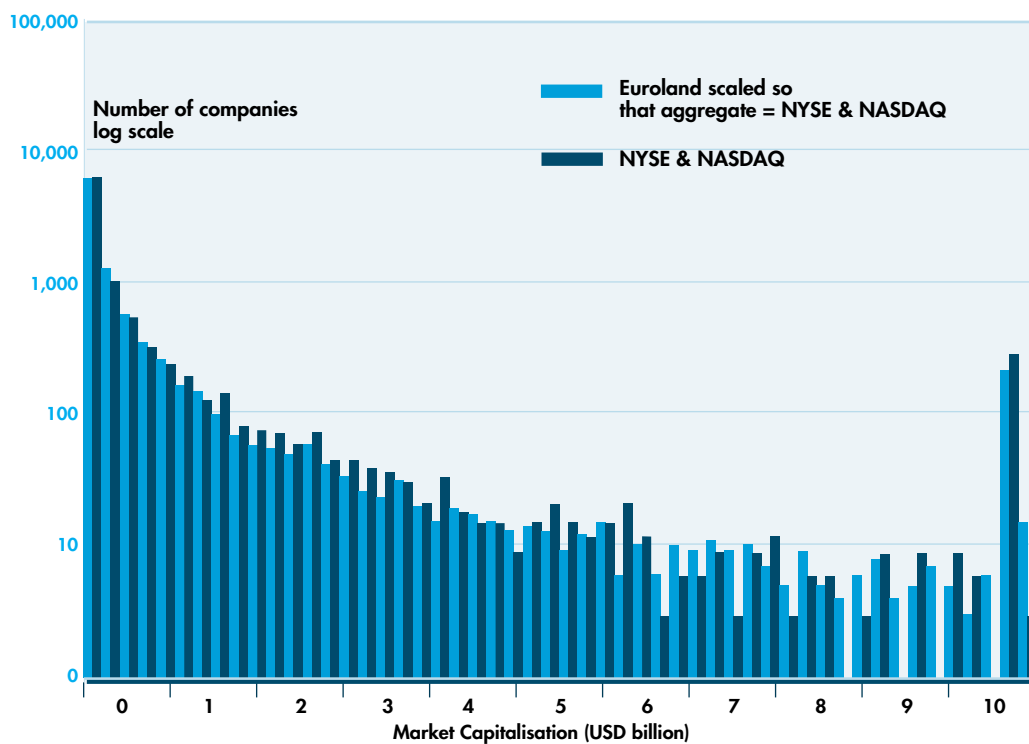
One area in which Euroland financial markets are particularly restricted is equity markets. The number of publicly listed companies and the size of equity markets in Euroland is considerably smaller than in the US. As noted in the introduction, one of the main conclusions of research into the prospects for Euroland financial markets is that equity markets will grow and more companies will go public. A major reason for this expectation is the economies of scale argument above (rather than anything to do with investor behaviour).

It is received wisdom that the smaller equity markets in Europe are a reflection of the difficulty of small to medium sized companies in Europe gaining a listing. One way to test this is to see if the structure of the US equity market is markedly different to the aggregate of Euroland equity markets. If it is true that small and medium sized companies are restricted in their access to equity capital one would find relatively fewer small and medium sized companies listed on Euroland stock exchanges than in the US. Figure 8 shows the number of companies listed on the NYSE and NASDAQ compared with the aggregate of the EMU-11 countries (11). There do not appear to be any marked differences between the two markets from this comparison. Figure 9 looks at the same issue from an alternative perspective. It takes the difference between the number of companies in each band of the first graph and weights this by the market capitalisation of the band. Each bar represents the difference in market capitalisation adjusted so that the aggregate capitalisation is the same in each case. If small and medium sized companies were under-represented in Euroland compared with the US, the bars on the left would be larger than those to the right. In fact there is no systematic pattern between the two.

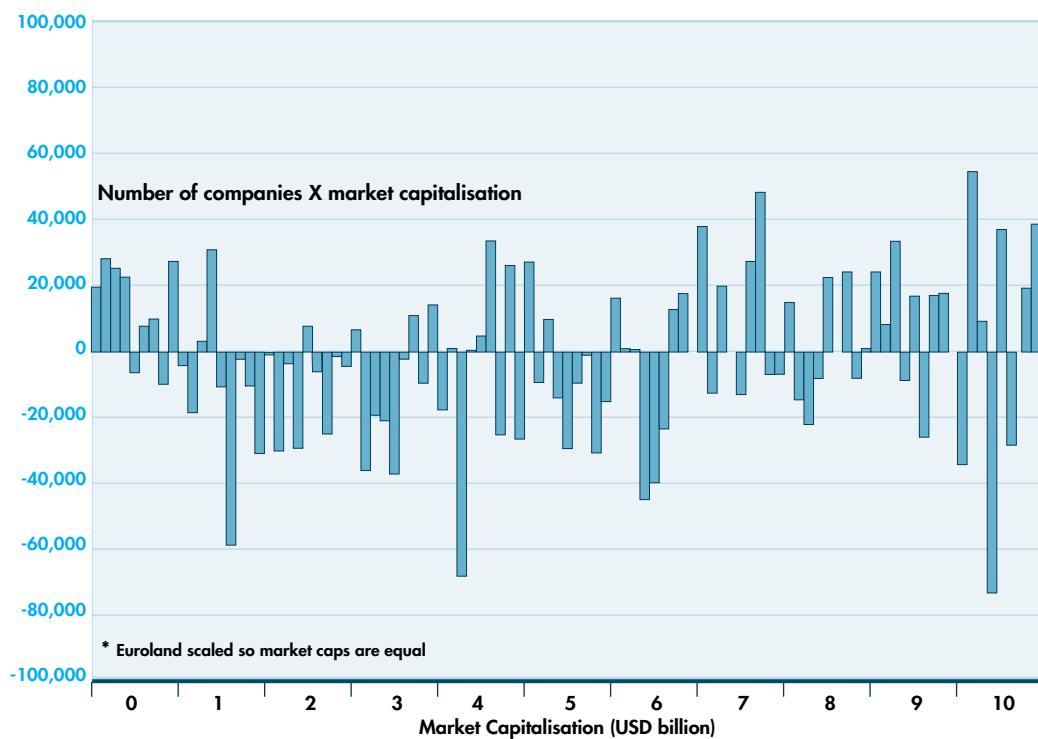
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11) The data for the EMU-11 countries are scaled so that the aggregate number of listed companies is the same as the total for NYSE and NASDAQ. This is because our interest is in the distribution of companies not the absolute number.

**Figure 8.** Number of companies - NYSE & NASDAQ vs. Euroland



**Figure 9.** Difference in number of companies weighted by market capitalisation





***The constraints on the development of equity markets are more than just scale. There are fundamental factors that deter companies from seeking a listing in Euroland.***

This experiment suggests that the “problem” of smaller equity markets in Euroland is not caused by small and medium sized companies being deterred from listing. The distribution of listed companies in Euroland appears similar to that in the US. This research is preliminary but it reinforces the impression from other work that the constraints on the development of equity markets in Euroland are more than a question of scale and that there are fundamental factors which prevent or deter companies from seeking a listing in Euroland.

EMU undoubtedly promises great change for financial markets in Europe. For investors in all classes of assets, the key change is the removal of existing distinctions between national markets. Some of this will be prompted by changes in regulations. Further changes will be prompted by the increased correlations between some national markets. In particular, this will lead to growing credit markets. Ultimately, Euroland financial markets may grow to match those in the US. However, this will take a very long time and there are structural barriers to such growth. Nonetheless, dramatic changes are likely to come. A key aspect is the way that investors will change their behaviour when investing in European financial markets.

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