

EMU and the cost of capital

EMU study



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*This study has been prepared by HM Treasury to
inform the assessment of the five economic tests*

This study has benefited from comments by Bank of England officials. All content, conclusions, errors and omissions in this study are, however, the responsibility of HM Treasury alone.

This is one of a set of detailed studies accompanying HM Treasury's assessment of the five economic tests. The tests provide the framework for analysing the UK Government's decision on membership of Economic and Monetary Union (EMU). The studies have been undertaken and commissioned by the Treasury.

These studies and the five economic tests assessment are available on the Treasury website at:

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EXECUTIVE SUMMARY

1 The third of the UK Government's five economic tests for EMU entry asks whether joining EMU would create better conditions for firms making long-term decisions to invest in the UK. To inform the assessment, this study considers the potential impact of EMU on the cost of capital for UK firms. Economic theory and evidence suggests a firm will invest if the expected returns from the investment exceed the cost of the investment. The cost of capital is therefore an important component of a firm's investment decision.¹

2 Historically, private sector investment levels in the UK have lagged behind those in other major economies. A possible explanation is that the cost of capital in the UK has been higher than it could be, perhaps due to economic inefficiencies, for example in capital markets, or to instability caused, for example, by mistakes in macroeconomic policy-making in the past. In or out of EMU, the UK Government places a high priority on maintaining macroeconomic stability and on microeconomic reforms aimed at improving the conditions in which UK firms raise capital.

3 Firms' investment decisions are determined by the real cost of capital, which is the nominal cost adjusted for inflation expectations. Firms typically raise capital through either debt or equity. In either case, the cost of capital can be broken down into two key components: the economy-wide credit risk-free rate of return and a market risk premium. There is the potential for both of these components to fall if the UK joined EMU:

- the **credit risk-free rate** may fall if joining EMU reduces macroeconomic volatility and lowers inflation expectations. This was an important economic benefit of EMU for many of the current euro area countries, particularly those with histories of high and volatile inflation; and
- the **market risk premium** component of the cost of capital could fall as the integration of EMU financial markets has the potential to reduce risk for investors in financial assets such as equities and bonds.

Implications of EMU for the credit risk-free rate

4 The credit risk-free rate for major industrial countries which have sustainable debt-to-GDP levels can be proxied by the yields on government bonds. This reflects the virtually credit risk-free status of government debt in these circumstances.

5 Analysis of trends in government bond yields suggests that in euro area countries such as Spain and Italy, where inflation expectations have historically been relatively high, there was a significant decline in nominal credit risk-free rates in the run up to EMU. Nominal risk-free rates in these countries converged to those of low inflation countries such as Germany and France, largely driven by falling inflation expectations. There is no evidence that credit risk-free rates fell in large low-inflation countries in the run-up to EMU as a consequence of prospective membership.

6 The expectation that EMU would deliver a more stable macroeconomic environment may also have reduced the inflation risk premium, and therefore the real cost of capital, in previously high inflation countries. However, the inflation risk premium is unlikely to be an important influence on UK real interest rates given that the market expects the UK macroeconomic framework to maintain stable and low inflation. This is in contrast to the situation in 1997, when UK credit risk-free rates were higher than those of countries such as Germany due to the UK's history of high and volatile inflation.

¹ The analysis in this study of developments in EMU financial markets also provides information that is relevant to the EMU test on financial services, which asks what impact would entry into EMU have on the UK's financial services industry.

7 While the gap between the UK and euro area credit risk-free rates is no longer as large as it was in 1997, there would still be some implications for UK credit risk-free rates were the UK to enter EMU, because this may reduce market segmentation between the UK and euro area government bond markets. This would be driven by the elimination of currency risk between the two markets, and the shared official short-term interest rates in the UK and the euro area. Given this, if all other things were equal, the UK government bond yield curve in EMU would be likely to closely match those of other large AAA-rated government bond markets such as Germany, France and the Netherlands.

8 The move to closer convergence with euro area bond yield curves may involve two shifts. Long-duration UK government yields may rise to euro area levels, while short-duration yields may move down to match lower short-term euro area yields. However, these movements are unlikely to have a significant impact on the real corporate cost of capital. Short-term differences in the euro and UK yield curve probably reflect predominantly cyclical factors, although joining EMU would remove any premium or discount linked to expected changes in the exchange rate. Corporate bond yields at the long end of the curve tend to be dominated by credit risk, limiting the impact of an increase in long UK risk-free rates on the corporate cost of capital. Overall, this means UK entry is unlikely to have a significant impact on the real corporate cost of capital through changes in the credit risk-free rate.

Implications of EMU entry for the market risk premium

9 The second component of the real cost of capital is the market risk premium. Several statistical studies and surveys of market participants have concluded that the euro area financial market has become more integrated since EMU. This has the potential to lower the cost of capital for euro area firms, as the euro area market risk premium could be lower than domestic market risk premia.

10 The market risk premium is composed of credit risk – the risk of default – and of liquidity risk – the risk of not finding a seller or buyer at a reasonable price. The credit and liquidity risks for corporates raising capital in the larger EMU financial market could be expected to be lower than in the smaller UK market. Credit risk may be lower as investors are able to spread risk by investing in a diversified portfolio of assets across a large market. A larger market will reduce liquidity risk as buying and selling assets becomes easier.

11 There is evidence of growth and integration in the euro area financial market since the start of EMU. Euro area corporate bond issuance grew strongly after 1999. Euro area equity issuance also grew up to 2000, tailing off with the fall in global equity markets. There have been changes in the financial infrastructure in Europe, with mergers between stock exchanges, the establishment of pan-European bond trading platforms, and mergers of settlement systems. There is evidence of greater portfolio diversification and a fall in transactions costs within the euro area, suggesting that the integration necessary for a fall in the market premium is taking place.

12 Increased access to the large and integrated euro area financial market could affect the size of the risk and liquidity premia on the UK cost of capital. At present large UK firms can access the euro market from outside EMU at relatively low cost. However, the removal of exchange rate risk and transactions costs that EMU would bring, alongside the removal of some institutional constraints on foreign currency holdings, would increase access at the margin.

13 For UK borrowers to gain the full advantages of lower financing costs from a single European financial market there will need to be significant progress on lowering the remaining legal, regulatory and cultural barriers to full integration. These include the retention of regulations restricting the holdings of foreign assets by pension funds and other investment funds, higher transactions costs involved in cross border activity due to the lack of fully-integrated financial infrastructure and the informational costs still faced by fund managers investing overseas. Removal of these barriers will benefit borrowers whether or not the UK enters EMU.

Implications of EMU entry for SME financing **14** The impact of EMU entry on the cost of capital for small and medium-sized enterprises (SMEs) could be very different from that experienced by larger firms. In principle, the removal of currency costs on cross-border financial transactions would be relatively more important for SMEs. However, information and monitoring costs are also an important reason why SMEs tend to raise funds through local retail finance. Bank lending is the largest source of SME finance in the UK, with over 60 per cent of the total. Venture capital is much less important in volume terms, accounting for just 1 per cent of external financing used by SMEs, but it can be an important source of finance in high-risk and high-growth areas.

15 In EMU, smaller SMEs in particular would be likely to remain reliant on local retail finance. Over the longer term, EMU entry could potentially increase competition in the UK retail market for bank lending to SMEs. It could also increase the size of the venture capital market.

Implications of EMU entry for the structure of corporate financing **16** UK firms are typically characterised as having a different capital structure from those in the euro area: ownership is equity-orientated and highly diversified. Large UK firms rely more on equity to raise capital, while in the euro area bank lending is more important. Some analysts suggest the UK's structure leads to capital market imperfections which raise the cost of capital, though evidence on this is far from clear.

17 Many indicators suggest the euro area is moving more towards an equity-orientated structure. If EMU and other financial developments promote the development of a more equity-orientated finance structure in the euro area, then EMU entry would be unlikely to alter the structure of UK corporate finance. If different ownership structures continue to exist side by side in EMU, and they are augmented by lower barriers to cross border incorporation, this could enable UK firms to utilise different financing structures inside EMU, were the UK to decide to join.

Conclusions **18** Overall, the study finds little scope for UK credit risk-free rates to fall significantly were the UK to enter EMU. The market risk premium for corporate borrowers raising capital in the larger EMU financial market could be expected to be lower than in the smaller UK market. UK firms can access the euro financial market from outside EMU at relatively low cost, but entry would increase access at the margin. These issues are considered in the assessment of the investment test – the third of the Government's tests for EMU entry.

INTRODUCTION

1.1 The third of the UK Government's five economic tests for EMU entry asks:

"would joining EMU create better conditions for firms making long-term decisions to invest in Britain?"

1.2 To inform the assessment of the five tests, this study considers the potential impact of EMU on the cost of capital. Economic theory and evidence suggests a firm will invest if the expected returns from the investment exceed the cost of the investment. The cost of capital is therefore an important component of a firm's investment decision.¹

1.3 Historically, private sector investment levels in the UK have lagged behind those in other major economies. A possible explanation is that the cost of capital in the UK has been higher than it could be, perhaps due to economic inefficiencies, for example in capital markets, or to instability caused, for example, by mistakes in macroeconomic policy-making in the past. In or out of EMU, the UK Government places a high priority on maintaining macroeconomic stability and on microeconomic reforms aimed at improving the conditions in which UK firms raise capital. For example, the Government has an active programme of reforms to domestic capital markets, following the Cruickshank, Myners and Sandler reviews. The Government has also introduced reforms aimed at increasing the supply of risk capital to UK enterprises. Moreover the Government sees macroeconomic stability as a central objective, a platform from which microeconomic policy reforms can be delivered and market productivity improved.²

The 1997 assessment

1.4 The 1997 assessment of the Government's five economic tests highlighted the importance of this issue for many of the current euro area countries. It noted that for many countries *"a lasting fall in nominal and real interest rates is one of the main economic reasons for joining EMU."* Several euro area countries benefited from a significant fall in nominal interest rates in the run up to EMU entry, on the expectation that EMU would deliver low and stable inflation. This was particularly the case for countries which, in the past, had experienced high and volatile inflation.

1.5 The 1997 assessment also noted that in the case of the UK there was at the time a differential between UK and German interest rates which suggested *"there would be a credibility gain for the UK from joining EMU"* possibly leading to lower interest rates and a lower cost of capital. The situation now is very different. As a result of the reforms to the UK's macroeconomic framework introduced in 1997, the UK has a stable macroeconomic environment with low inflation. The differential between UK and German interest rates has narrowed sharply. Indeed for longer maturity interest rates the differential has reversed, so that UK rates are now lower than those in Germany. In effect, the potential increase in credibility referred to in the 1997 assessment has been achieved outside of EMU.

The key issues considered in this study

1.6 From this starting point the objective of this study is to consider how, against this backdrop, possible EMU entry would affect the UK cost of capital. The study does not attempt to directly measure an average cost of capital in the UK or the euro area. As is discussed in Section 2, for a number of reasons this is a very difficult task. It is also not necessary for the purposes of this study. Instead, the approach taken is to break down the cost of capital into its component parts and then analyse the implications of EMU for each

¹ The analysis in this study of developments in EU financial markets also provides information that is relevant to the EMU test on financial services, which asks what impact would entry into EMU have on the competitive position of the UK's financial services industry.

² See successive Budgets and Pre-Budget Reports for full details on this reform programme.

part. A brief summary of this approach is given below and is explained in more detail in Section 2, which sets out the analytical framework for the study. The nature of this topic means that it covers some technical and complex economic issues. Some of the key technical terms used throughout are set out below.

1.7 The starting point for the analysis is to consider the ways in which firms raise capital for investments. A significant quantity of investment is funded with internal finance from retained profits. EMU could affect the funds available for internal finance, for example through its impact on growth, an issue considered in the Government's fifth economic test for EMU. However, this study focuses on the implications of EMU for the cost of external finance. Firms typically raise external finance in one of two ways: debt or equity. The components of the cost of debt and equity finance are very similar.

The credit risk-free rate of return **1.8** In both cases, the base is the **credit risk-free rate of return** in the economy. This depends on the balance of aggregate savings and investment in the economy, and so reflects firms' and consumers' preferences between current and future consumption. In major industrialised countries with sustainable public debt levels, the interest rate on government bonds can be used to provide an indication of the credit risk-free rate, and this is the central approach taken in this study. However, there are a number of reasons why government bonds are not necessarily an accurate proxy for the credit risk free-rate. These issues are explored in detail in later sections, and alternative proxies are considered.

The market risk premium **1.9** On top of the credit risk-free rate of return, the cost of capital for firms includes a **market risk premium**, which investors demand to reflect the perceived risk of investing in a particular market, sector, firm or project. The market risk premium might be affected by EMU entry because it depends in part on the size and efficiency of financial markets.

The degree of market segmentation and home bias **1.10** The degree to which EMU affects both of these components of the cost of capital depends in large part on the degree of **financial market segmentation** across countries. If markets were fully integrated then the cost of capital faced by firms of equal riskiness would be equal across all countries. However, if there are barriers to cross-border investment, which prevent the free flow of capital across borders, then the cost of capital can be different in different countries. A well-known puzzle in financial economics is that investors have a **home bias** – they invest heavily in domestic assets and less than might be expected in overseas assets. A key issue for this analysis is whether the exchange rate acts as a barrier to cross-border flows of capital, or whether market segmentation and home bias are primarily due to other factors.

Structure of the study **1.11** To address these questions the analysis in this study is split into six sections:

- Section 2 outlines the theoretical framework used in the analysis;
- Section 3 considers the possible impact of EMU on the UK credit risk-free rate of return;
- Section 4 considers the possible impact of EMU on the UK market risk premium;
- Section 5 considers the implications of developments in EMU financial markets for UK small and medium-sized enterprises (SMEs);
- Section 6 considers how changes in the structure of corporate finance in EMU might affect the UK cost of capital; and
- Section 7 concludes.

The counter-factual for the analysis

I.12 In order to provide a base point for the analysis, it is important to set out the appropriate counterfactual. In other words, what environment does the analysis assume firms raising capital would face if the UK remained outside EMU?

I.13 In terms of the credit risk-free rate and UK government bond yields, the counterfactual is that outside EMU the UK macroeconomic policy framework put in place in 1997 continues to maintain a low and stable level of inflation in line with the Government's objectives. The question that is addressed in this study is how entry to EMU might affect the credit risk-free rate against this base.

I.14 In terms of financial markets, the counterfactual is that the UK financial sector maintains and builds on the strong links that it already has with those in the other EU Member States, and that the integration of EU financial markets continues, driven in part by the Financial Services Action Plan (FSAP). The potential gains from greater financial integration within Europe are large. Recent estimates for the European Commission (London Economics, 2002) suggest full market integration could lead to a fall in the EU average cost of equity and bond capital of around 50 and 40 basis points respectively, which, it is estimated, could boost the level of GDP by 1.1 per cent across Member States in the long run. The question addressed in this study is whether, were the UK to enter EMU, there would be additional cost of capital savings for UK firms on top of these estimated savings.

The study in the context of the five tests assessment and other EMU studies

I.15 Two other EMU studies are particularly relevant to this analysis. The EMU study by HM Treasury *The location of financial activity and the euro* considers the development of financial markets in the euro area. The EMU study by HM Treasury *EMU and business sectors* examines developments in the business environment in Europe in recent years and considers the impact of EMU on these trends. It also considers the potential impact of EMU on the business environment for SMEs. The implications of EMU entry for the cost of capital faced by SMEs is the focus of Section 5 of this study.

2.1 This section sets out the theoretical structure used to analyse the cost of capital, and highlights some of the key difficulties that are faced in considering the impact of EMU. The starting point is an explanation of why the cost of capital is an important component of a firm's decision to invest. The analysis then considers the components of the cost of debt and equity, and how these components could be affected by EMU entry.

Why the cost of capital matters

Investment theory

2.2 Economic theory points to an important role for the cost of capital in investment decisions. For example, the simple neo-classical theory of investment suggests that a firm will invest until the marginal return from investment equals the marginal cost of capital (for example see Jorgensen, 1963). Two central factors drive investment in the neo-classical model: the return from investment, which is governed by the price and volume of output; and the cost of capital, which is determined by factors such as the interest rate, depreciation and tax.

2.3 A shortcoming of the simple neo-classical model is that there is no explicit forward-looking element, for example, there is no direct consideration of expectations of future profits. This is addressed in dynamic models of investment, of which Tobin's Q model¹ is an example. Tobin's Q is the ratio of the forward-looking stock market valuation of the firm (which approximates to the market's estimate of the present value of new investment) to the price of new equipment (which approximates to the marginal cost of capital). This relationship can be viewed as the ratio of the present value of marginal investment to the marginal cost of the investment. If Tobin's Q is greater than one, i.e. if the marginal value of investment exceeds marginal cost, then it makes sense for firms to invest more. The optimal level of investment is where Tobin's Q equals one.

2.4 Empirical studies using these approaches have tended to find that quantity variables such as output dominate the relationship, and that there is only a weak link between investment and the cost of capital (though see OECD, 2002 for a recent example of where a significant relationship between investment and the cost of capital has been found). One reason may be the difficulty in accurately measuring the cost of capital facing firms, an issue which is discussed further below.

2.5 This discussion highlights that in both the neo-classical and dynamic models the cost of capital plays a key role in determining investment levels, which is why it is an important issue to examine in the context of the investment test for EMU entry.

2.6 The analysis in this study is focused on the implications of EMU entry for the cost of capital raised externally by firms. However, a significant quantity of investment is funded with internal finance from retained profits. The cost of capital will influence both internally and externally financed investment as firms will consider the opportunity cost of using available funds in terms of returns available elsewhere. In addition, EMU could affect the funds available for internal finance, for example through its impact on growth. The impact of EMU on growth, stability and jobs is considered in the Government's fifth test for membership of EMU.

The components of the cost of capital

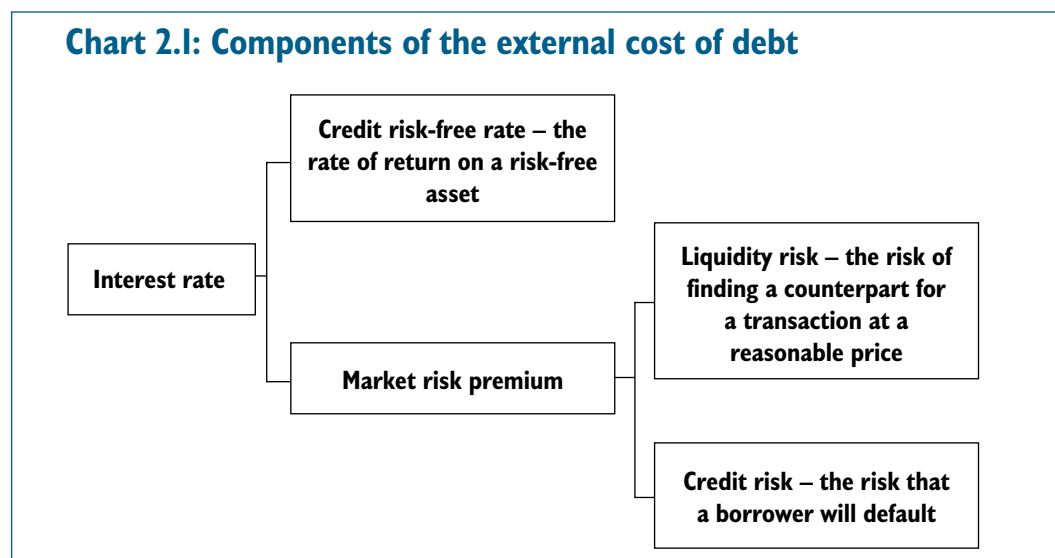
2.7 There are two general forms of external finance available to firms: debt and equity. Firms raise debt finance by borrowing from a financial institution or by issuing a bond. Firms

¹Tobin (1969).

raise equity capital by selling a share in future profits, either through a public offering or through a private deal. The overall cost of finance to a firm is the weighted average cost of its debt and equity. There is an extensive literature on issues involved in measuring the weighted average cost of capital and numerous variations on the basic methodology have been devised (for example, see Brealey and Myers, 2000). This study does not aim to measure the cost of capital, and therefore does not consider these methodological issues in detail.² The objective of the study is to consider how the cost of capital for UK firms may be affected by EMU entry. The framework used is to break down the cost of capital into its component parts.

The components of the cost of debt

2.8 Chart 2.1 illustrates the components of the cost of debt. The interest rate on borrowing or bond issuance represents the overall cost to the borrower of debt (there may be additional costs such as one-off arrangement fees). The interest rate can be divided into a number of different components. First, is the *credit risk-free rate* which can be proxied, under certain conditions, by the rate of return on government bonds of major industrialised countries with sustainable debt levels.³ In addition to this is a *market risk premium*, which is the return investors demand for holding a risky asset. The market risk premium can be divided into two further components. *Liquidity risk* is the risk involved in finding a counterpart for a desired transaction at a reasonable price. *Credit risk* is the risk that the borrower will default on the debt.



The components of the cost of equity

2.9 The components of the cost of equity are similar to those of the cost of debt, in that they can be characterised as the *credit risk-free rate of return* plus the *market risk premium*. One of the most widely used methodologies for calculating the cost of equity is the capital asset pricing model (CAPM). In this model the cost of equity is defined as the economy-wide risk-free rate of return plus the individual risk premium the market attaches to an investment:

$$\text{Cost of equity capital} = \text{credit risk-free rate} + \text{stock's } \beta \times \text{market risk premium.}$$

² Accurate measurement of the cost of capital at a country level is difficult. Figures for the cost of debt, particularly bank financing, are often not widely available. Measuring the cost of equity using a model such as CAPM requires estimates of *beta* and of the equity market premium. These can be estimated on the basis of past data, but this assumes no change going forward, which may not be realistic. If accurate measures of the cost of debt and equity can be found, the next step would be to put together a weighted average cost of capital using the proportion of debt and equity used by firms. This requires data on the stock of debt and equity which is often not available. There are also difficulties in estimating the real cost of capital. This should properly be derived using *ex ante* measures of expected inflation, but these are often not available.

³ An alternative, examined later in the paper, is swap rates, which can be useful where institutional or regulatory factors may be skewing the yields on government bonds.

2.10 The equity market risk premium is made up of two components:

- The *market risk premium* is the premium that investors require for the risk of putting money into a market portfolio of equities rather than into a risk-free asset. It is possible to estimate the historical market premium on the basis of the degree to which the market has outperformed risk-free assets in the past. Over the long run, investors should drive prices of shares towards the level needed to yield the premium they require to compensate them for the risk of holding shares.
- Each individual stock contributes to the risk of a portfolio, depending on the stock's correlation to the general market movement, known as the *beta*. A stock which moves more than the market has a *beta* of greater than one; a stock which moves less than the market will have a *beta* of less than one. Picking a portfolio from stocks which all have *betas* of two would produce a portfolio with a *beta* of two, i.e. that moves twice as much as the market.

Analysis of the cost of capital in the study

2.11 The analysis in this study focuses on the potential impact of EMU on the two key components of the cost of capital: the credit risk-free rate and the market risk premium. A theoretical basis for the analysis of these two components is now outlined.

The credit risk-free rate

2.12 In major industrial countries with sustainable debt-to-GDP levels, government bonds are assumed to be virtually credit risk-free. This makes it possible to use interest rates on government bonds as a proxy for credit risk-free rates, and this is the approach taken in the paper.⁴ However, there are also a number of reasons why government bond yields may not always be an accurate proxy for credit risk-free rates. These are discussed in more detail in Section 3 where alternative proxies for the risk-free rate, such as the swap rate, are presented.⁵

2.13 Box 2.1 explains the economic drivers of countries' government bond yields. This suggests two reasons why credit risk-free rates may differ across countries:

- differences in inflation expectations and the inflation risk premium; and,
- differences in the real rate of return.

Inflation expectations

2.14 The nominal interest rate compensates investors for the expected reduction in the real value of an asset through future inflation. The EMU study by HM Treasury *Policy frameworks in the UK and EMU* explains that the inflation targets of the monetary authorities in the UK and euro area are similar in practice. This means there is unlikely to be a significant difference in the expected rate of inflation between the UK and the euro area. This is discussed further in Section 3.

The inflation risk premium

2.15 In addition to inflation's influence on the nominal rate, it can also influence the real component of the credit risk-free rate. If investors believe there is a risk that inflation will be higher than expected, they may demand an inflation risk premium.

⁴ Government bond yields also include a liquidity premium, which reflects the ease with which the bond can be traded. For the purposes of using the government bond yield as a proxy for the risk-free rate, this is ignored in the subsequent analysis. It is looked at again in analysis in Section 3 of likely developments in UK government bond yields were the UK to enter EMU.

⁵ See also Cooper and Scholtes (2001) for a similar discussion.

Box 2.1: Economic determinants of international government bond yields

Three economic relationships are relevant to the differentials in international bond yields¹: Uncovered Interest Rate Parity (UIP), Purchasing Power Parity (PPP), and the Fisher Equation.

UIP hypothesises that in a world of freely floating exchange rates and perfect capital mobility, interest rates and exchange rates should be such that an investor would be indifferent between holding an interest-bearing asset denominated in domestic currency, and an equivalent one denominated in foreign currency. Formally, **UIP** can be defined as:

$$i_t^* - i_t = s_{t+1}^e - s_t + \rho_t \quad [1]$$

where: i_t^* and i_t are the foreign and domestic one-period nominal interest rates respectively; s_t is the spot exchange rate (foreign currency price of domestic currency); s_{t+1}^e is the market's one period ahead forecast of the spot exchange rate; and ρ_t is the risk premium.

PPP states that the differential between the expected inflation rates between two countries is equal to the expected movement of the exchange rate between the two countries' currencies:

$$\Pi_{t+1}^* - \Pi_{t+1}^e = s_{t+1}^e - s_t \quad [2]$$

where: Π_{t+1}^* and Π_{t+1}^e are the market's forecasts for the change in the foreign and domestic price levels respectively between t and $t+1$. Combining equations [1] and [2] gives:

$$i_t^* - i_t = \Pi_{t+1}^* - \Pi_{t+1}^e + \rho_t \quad [3]$$

Equation [3] states that the nominal interest rate differential between the bonds of two countries is equal to the expected inflation differential between the two countries plus a inflation risk premium. That is, differences in international bond yields can be explained, all other things remaining equal, by the difference between expected inflation rates, as well as by the inflation risk premium.

Finally, the **Fisher Equation** states that the relationship between the nominal return of a bond is equal to the expected rate of inflation over the holding period of the bond plus its real rate of return, r_t :

$$i_t = \Pi_{t+1}^e + r_t$$

The Fisher equation can be generalised, as investors may be interested in the external value of the currency as well as inflation, by substituting the expected outcome of the investor's targeted value, e.g. the exchange rate, for the expected rate of inflation, Π_{t+1}^e . For euro area investors, their target will have changed with the introduction of EMU, so that those targeting inflation will need to consider whether it is euro area inflation or national inflation that matters.

¹ Based on Brooke *et al.* (2000).

The real rate of return 2.16 In general, the real rate of return can be thought of as the price which equates savings and investment. In the absence of any restrictions on capital flows, the real rate of return should be equal across countries, as any differences would be removed through international arbitrage. There would be a single 'world' real interest rate equating world saving and investment. Alternatively, in a world where national markets are completely segmented, then each national real interest rate would be the price which equated domestic savings and investment. In this case, the real interest rate would not necessarily be equal across countries.

2.17 There are a number of reasons why national markets might be segmented, such as institutional or regulatory restrictions on cross-border capital flows or a home bias to investment strategies which could be caused by information asymmetries, or perhaps by currency risk. Evidence suggests that national real interest rates do differ, suggesting that capital markets are at least partially segmented (for example, see Breedon *et al.*, 1999). The discussion in Section 3 considers reasons why real rates of return on long-dated bonds may differ in the UK and the euro area.

2.18 Even under the assumption of completely integrated markets, real risk-free rates may differ in the short run for cyclical reasons. If a country's real exchange rate is away from its medium or long-term equilibrium level, perhaps because output is away from trend, then short-term real interest rates may diverge because of expected real exchange rate movements. For example, if investors expect a country's real exchange rate to depreciate, then they would demand a higher real interest rate. However, in the long term, with the real exchange rate at equilibrium and free capital flows, real rates should be equal. This study is primarily interested in the long run implications of EMU entry, though of course the short run implications are also important and are considered.

The market risk premium

2.19 The market risk premium is the risk attached to investing in a risky asset over a risk-free asset. As the discussion of the cost of debt and equity above indicated, there are two key components of this risk. First is liquidity risk, the risk that an investor is unable to find a buyer or seller for an asset at an acceptable price. Second is the risk that the firm will default on its obligations, the credit risk.

2.20 One of the most significant potential benefits of EMU comes from the creation of a deep and broad capital market across the euro area. A deeper market, defined as a market where assets are heavily traded, would reduce market participants' liquidity risk. A broader market, defined as a market where a wide range of assets are traded, would allow participants to diversify their holdings, so reducing credit and sector risk. A larger market is also likely to bring reduced transactions costs. These effects have the potential to reduce risk and lower costs for investors in market assets such as equities and bonds. The EMU market premium may therefore be lower than the market premium faced in national markets.

Implications of market segmentation for the market risk premium

2.21 As Stulz (1999) explains, in a world of fully segmented national capital markets, each country's investors would have to bear the full risk of their country's economic activity. The market risk premium they would demand for this would increase with national market risk. With capital market integration, domestic investors are able to diversify their risk profile by holding foreign assets. Because some of the unique credit risk of domestic and foreign assets is likely to offset each other, investors can hold an international portfolio which has the same expected returns as previously but with lower risk. In practice, investors who invest purely in their national securities markets are likely to enjoy some exposure to the international economy, as some domestically-listed firms will operate across borders.

Market segmentation and EMU

2.22 As the discussion above has highlighted, the degree of market segmentation will affect both the credit risk-free rate and the market risk premium. There are a number of reasons why EMU might reduce financial market segmentation among euro area countries. The removal of exchange rates within the euro area removes a transaction cost to investing abroad; and it also reduces exchange rate risk on European investments. Furthermore, many European investment funds are constrained by regulation to keep a certain proportion of their assets denominated in domestic currency. It is possible that UK EMU entry would provoke a one-off change in net flows, as institutional investors diversify into UK assets and UK institutions move into euro area assets. If UK institutions have already diversified more than their euro area counterparts, then flows into the UK from the euro area may exceed flows out of the UK, possibly increasing the availability of funds for UK firms.

2.23 Research underlines that currency risk on its own does not explain home bias (for example, see Brealey *et al.* 1999). Uncertainty about exchange rates can be hedged through a variety of financial products. Currency risk may not be undesirable; it may actually enable investors to diversify risk in their portfolio. Another explanation for home bias is that there are significant transaction costs and information costs to holding foreign assets. EMU in itself will only reduce transaction costs to the extent that it removes currency exchange costs; and it will only reduce information costs through the increased price transparency that comes from having a single currency. EMU could indirectly reduce transaction costs if it acts as a catalyst for the development of a more efficient regulatory environment in the EU financial markets, or promotes integration of financial market infrastructure such as trading and settlement systems.

2.24 The assumption in this study is that the integration of EU financial markets continues, driven in part by the Financial Services Action Plan (FSAP), and that this helps to reduce the cost of capital for EU firms. The question addressed in this study is whether if the UK were to enter EMU, there would be additional cost of capital savings for UK firms.

The proportions of debt and equity used by firms

2.25 EMU may also affect the proportions of debt and equity used by firms, which may affect the weighted average cost of capital. Large firms in euro area countries such as Germany have typically used greater quantities of bank lending than large companies in the UK, who have tended to issue more equity. Structural change and the ongoing process of financial market integration in the euro area, which EMU is one part of, are promoting greater use of equity funding in some euro area countries. Section 5 considers this issue.

Summary: the key components of the analysis

2.26 This theoretical review sets out three key elements for the subsequent analysis:

- the implications of EMU for the credit risk-free rate;
- the implications of EMU for the market risk premium; and
- the implications of EMU for the proportions of debt and equity used by firms.

EMU countries where inflation expectations and inflation risk have historically been relatively high witnessed a decline in nominal credit risk-free rates in the run-up to EMU. In part, this can be attributed to the expectation that EMU would deliver a more stable macroeconomic environment.

If the UK were to enter EMU, it is likely that UK credit risk-free rates would converge closely with those of the euro area. However, because the UK macroeconomic framework is expected to maintain stable and low inflation, these rates are already very similar. Moreover, short-term differences which do exist probably reflect cyclical factors rather than underlying structural differences. This means UK entry is unlikely to have a significant impact on the real corporate cost of capital through changes in the credit risk-free rate.

3.1 This section considers the impact of EMU on credit risk-free rates of return. It first considers developments in the existing euro area countries, and then looks at the potential implications of UK entry for the UK credit risk-free rate.

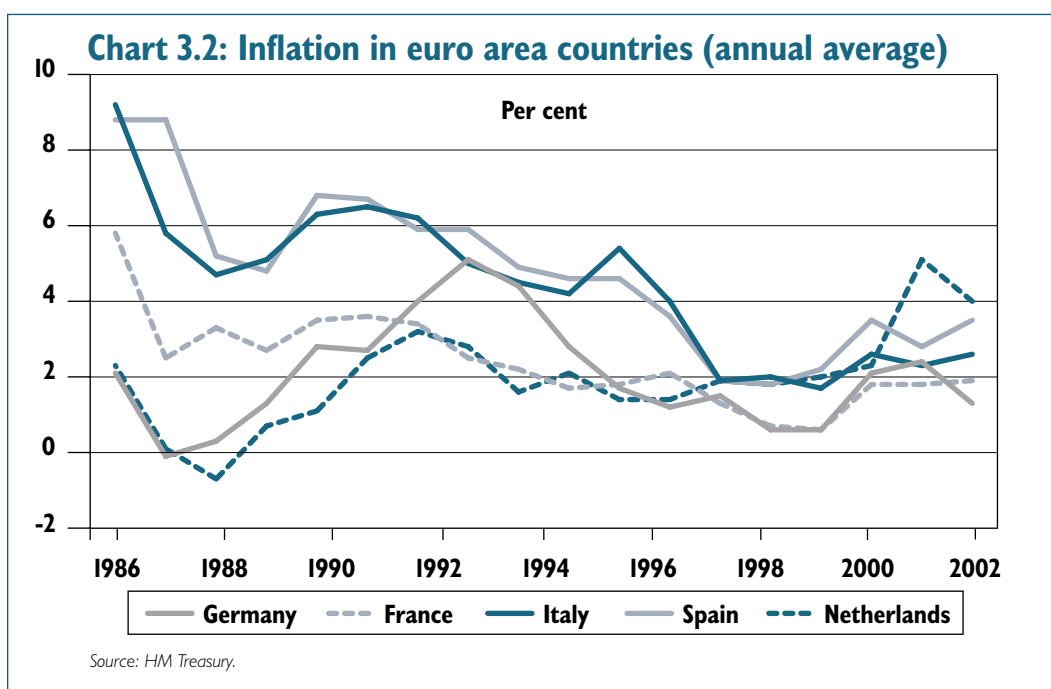
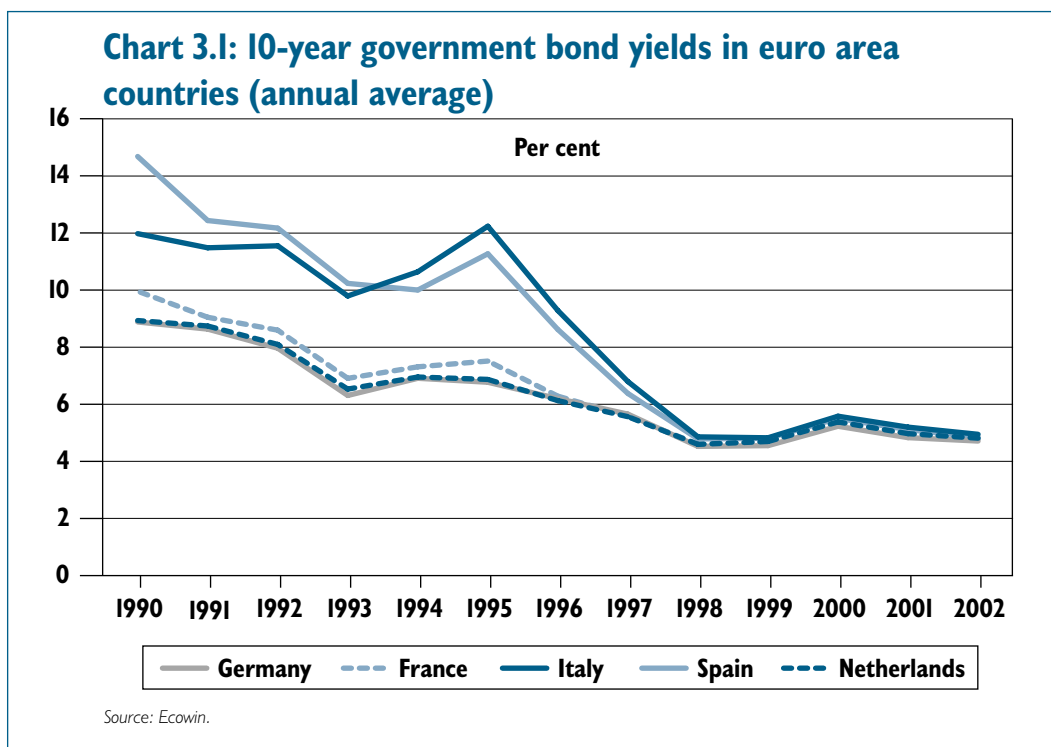
Impact of EMU on credit risk-free rates in the euro area

3.2 In major industrial countries with sustainable debt-to-GDP levels, government bonds are virtually credit risk-free – there is almost no risk that such governments will default on their debt commitments. Of course, no government bond will ever be completely free of credit risk; as discussed below, small differences in credit risk are one reason for the remaining small differences in euro area government bond yields. However, for this analysis, international government bond yields are used as a convenient proxy for credit risk-free rates. But for completeness, another potential proxy – the swap rate – is also considered. This also addresses any bias in the analysis stemming from some specific features in the UK government bond market, discussed in more detail below. A similar analysis can be found in the article by Willem Buiter in the EMU study *Submissions on EMU from leading academics*.

Developments in nominal euro area government bond yields

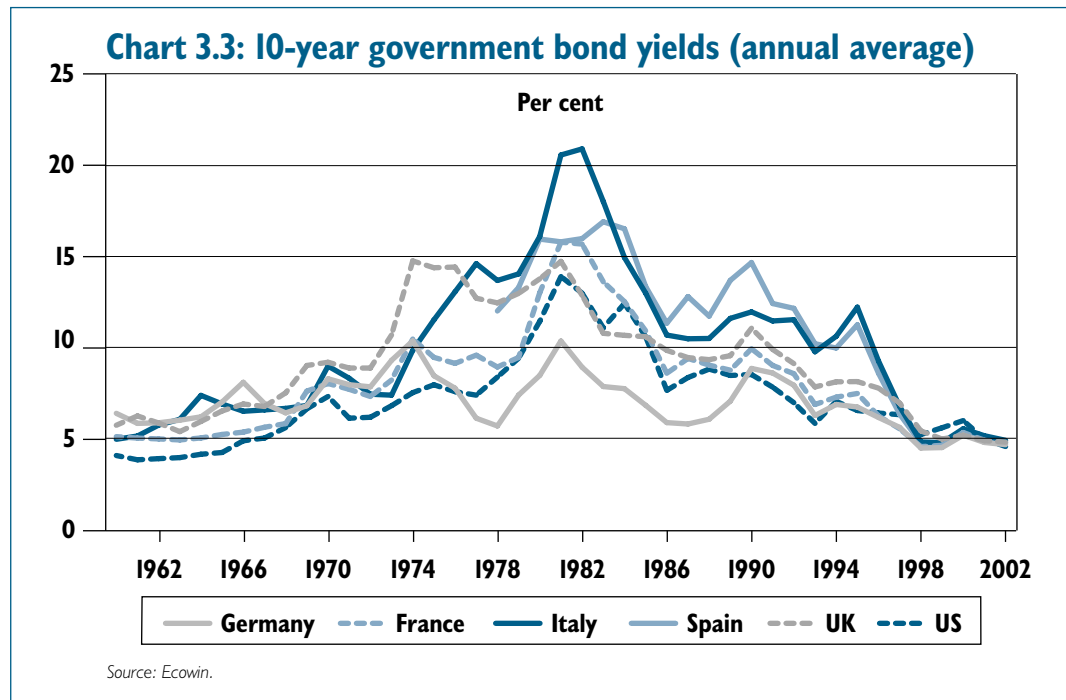
3.3 Chart 3.1 presents the development of nominal euro area government bond yields in the run-up to the start of EMU. The chart shows that nominal yields converged over this period and were very similar by the start of EMU in 1999, reflecting the common monetary policy within EMU. Remaining differences are due to small variations in the credit risk of national governments and in liquidity differentials. Chart 3.1 shows a steep decline in nominal yields in Spain and Italy, countries which have had histories of higher inflation (see Chart 3.2). As discussed in Section 2, inflation expectations are one of the factors explaining differences in international bond yields.

3.4 This suggests that an expectation that EMU would provide a low inflation environment has driven down nominal yields in these countries. In addition to a fall in inflation expectations, Spain and Italy will have experienced a decline in the inflation risk premium. If the macroeconomic environment in EMU is seen as more credible there is less risk of inflation being higher than expected.



3.5 The decline in nominal yields in Germany, France and the Netherlands in Chart 3.1 is less steep and is unlikely to reflect lower inflation expectations in EMU – these countries already had relatively low inflation in the 1990s. Chart 3.3 indicates that the pattern of falling yields over the 1990s is not restricted to EMU countries. Yields in the UK and the US have also declined over the 1990s, after a period of relatively high and volatile yields in the 1970s and 1980s. Brooke *et al.* (2000) find that much of the relative fall in UK yields over the past 25 years can be attributed to a decline in relative UK inflation expectations.¹ A number of UK market specific factors have also contributed to this fall and are considered in more detail in subsequent sections.

¹ These issues are also considered in Cooper and Scholtes (2001).



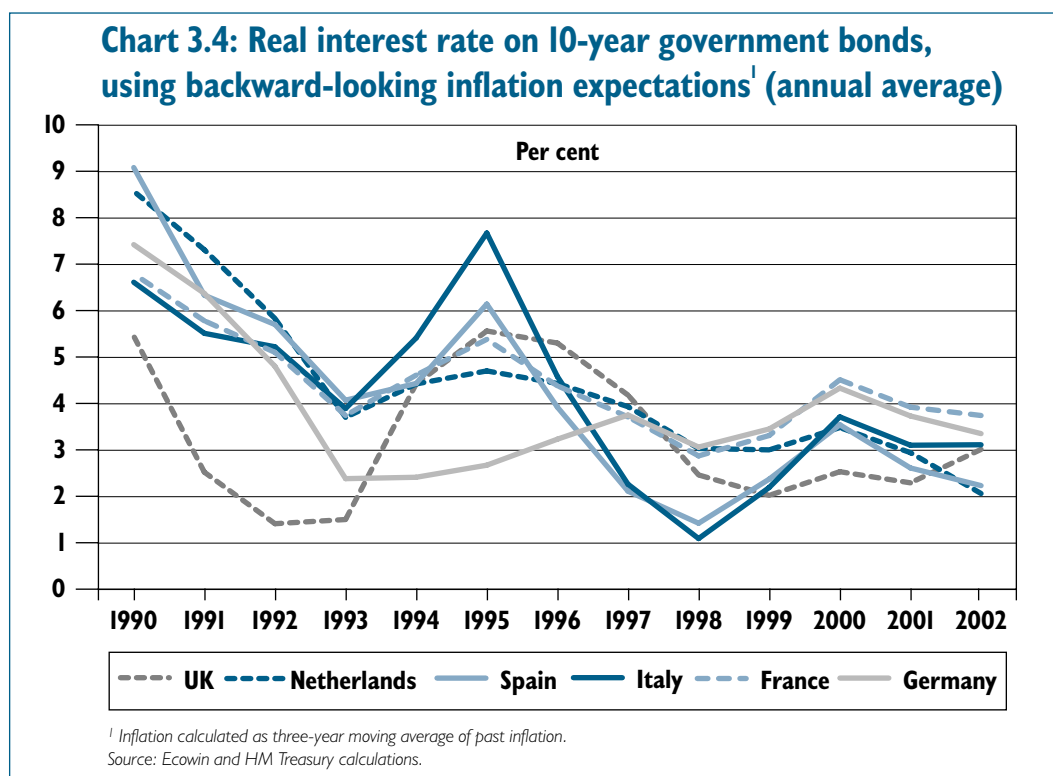
Nominal and real yields **3.6** It is important to make clear the distinction between real and nominal rates of return. Nominal interest rates are equal to the real interest rate plus the expected rate of inflation and the inflation risk premium (for more detail see the discussion of the Fisher Equation in Box 2.1). Ultimately it is real interest rates, and the real cost of capital, which will influence firms' investment decisions.

3.7 This analysis suggests that high inflation countries experienced a decline in nominal yields in the run-up to EMU. Much of this fall in nominal rates reflects a decline in inflation expectations and so does not translate into a decline in the real cost of capital which matters to firms. However, part of the fall can be attributed to a decline in the inflation risk premium associated with these countries' assets. The inflation risk premium reflects the risk that inflation will be higher than expected, and tends to be higher when actual inflation is high and volatile. A fall in the inflation risk premium is a real gain in the credit risk-free rate of return in these countries. Assuming that the cost of capital for firms in these countries is closely linked to the credit risk-free rate, this translates into a real fall in the cost of capital for firms.

Developments in euro area real risk-free rates **3.8** As discussed in Section 2, the underlying real interest rate is driven by the supply and demand for savings and investment, and in the absence of any restrictions on capital flows, the real rate of return should be equal across countries, as any differences would be removed through international arbitrage. There would be a single world real interest rate equating world saving and investment. Alternatively, with fully segmented capital markets each country would have a national risk-free real interest rate which may or may not be equal to that in other countries. International capital flows within the euro area were relatively unrestricted before EMU, which suggests persistent and significant differences in real interest rates would be unsustainable. However, exchange rate risk and regulatory restrictions on currency denomination of asset holdings may have created barriers to full capital market integration, allowing for the possibility of differences in real interest rates. To the extent that EMU removes these barriers, it may have created the potential for further convergence of real interest rates.

3.9 Deriving real interest rates from nominal interest rates requires an estimate of inflation expectations. This is difficult to measure. One simple approach is to assume that inflation

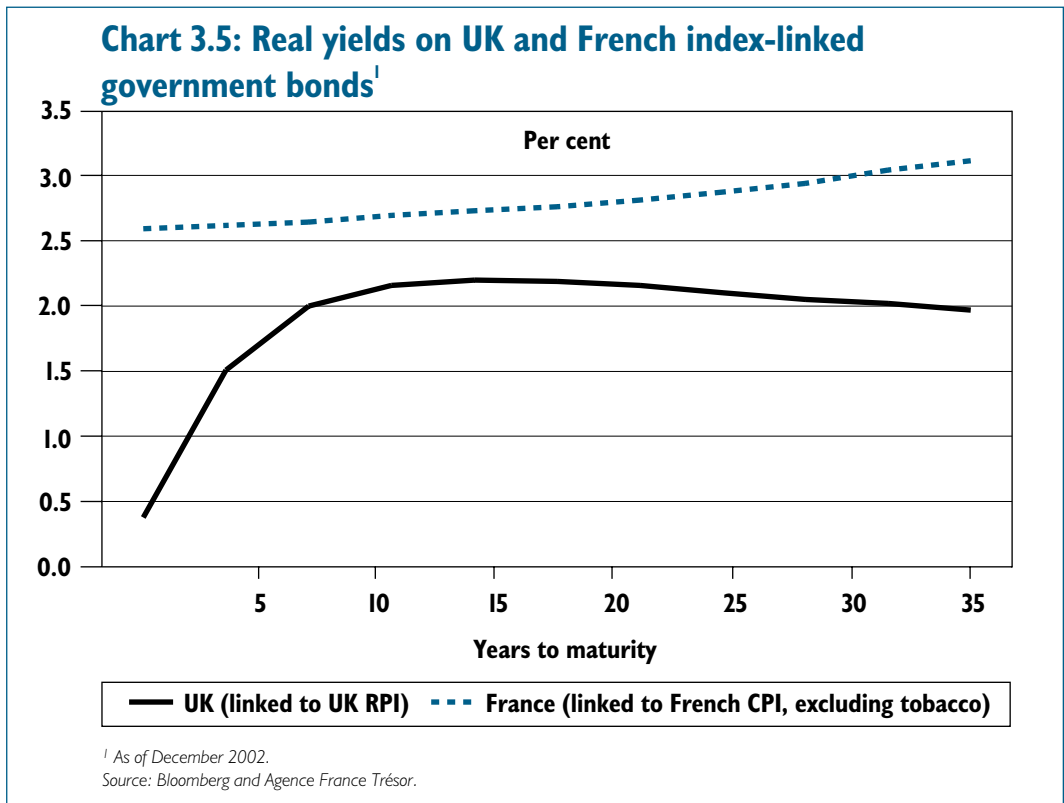
expectations are based on past inflation, and so use an average of past inflation as an estimate of expected future inflation. Chart 3.4 presents estimates of real credit risk-free interest rates in EMU countries by subtracting inflation (measured over the previous three years) from the nominal yield on ten-year government bonds. These should be approached with care as using backward-looking inflation expectations in an environment of declining actual inflation can bias down the real interest rate. The chart shows a decline in real credit risk-free rates in the euro area countries in the years leading up to and since the start of EMU. A similar decline has been seen in the UK, which makes it difficult to attribute the decline to EMU itself.



3.10 A different approach to analysing real interest rates is to look at the yields on index-linked government bonds. Chart 3.5 presents yield curves for index-linked bonds in the UK and France – the only large euro area country to issue this type of bond.² These show UK rates consistently below French rates over all maturities. However, it is difficult to use these yield curves to directly compare UK and French real rates because:

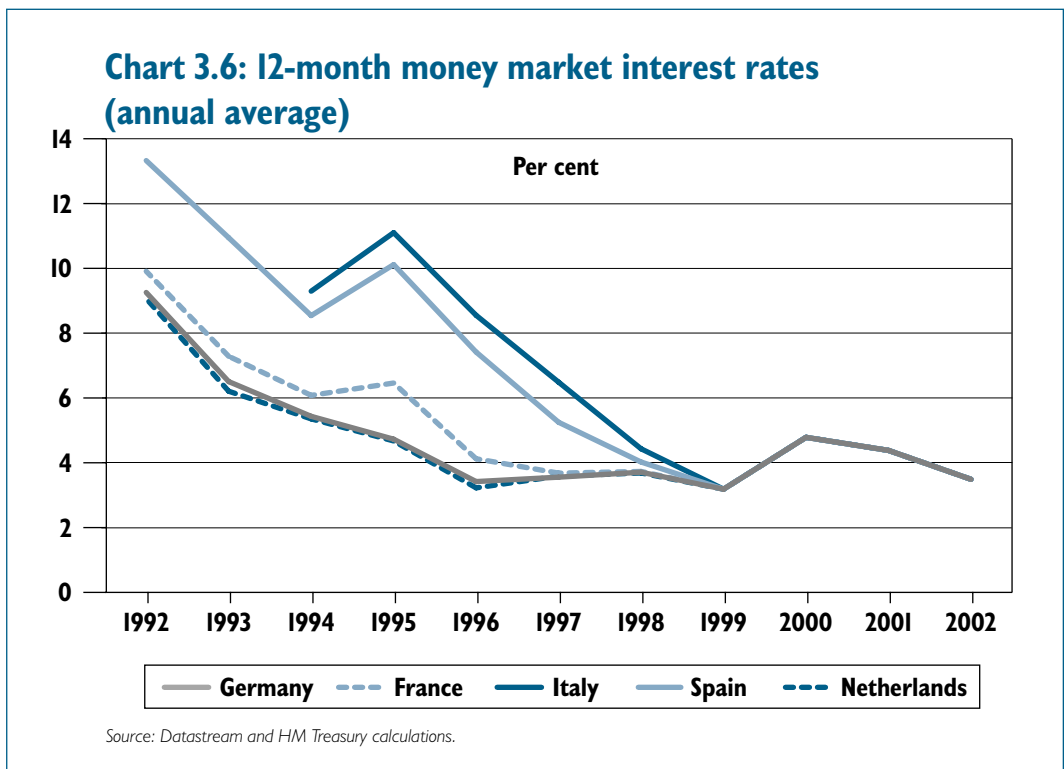
- inflation measures differ. So for example, using HICP measures of UK inflation rather than RPI would suggest a lower interest rate differential;
- the French index-linked bonds are new instruments and real yields will tend to be high as the market matures; and
- index-linked gilts are illiquid instruments, with activity in the market concentrated around auction dates. The major buyers of index-linked debt, pension funds and insurance companies, tend to buy and hold them in order to hedge their indexed liabilities.

² A yield curve maps yields against different bond maturities.



Pass-through to money market rates

3.II Evidence suggests that the decline in risk-free rates in the euro area has been passed through to commercial rates. Since EMU began in 1999, money market rates in EMU have equalised, due to the single monetary policy operated by the European Central Bank (ECB) and the ability of banks to transfer euro liquidity around the EU via the TARGET payment system. Again, this resulted in a large decline in rates in Spain and Italy. Chart 3.6 illustrates this fall in the inter-bank lending market in EMU countries.



3.12 In conclusion, the impact of EMU on credit risk-free rates in the euro area has been to contribute to a lowering of nominal rates in those countries, especially in Spain and Italy, where inflation expectations and inflation risk have historically been relatively high. As the anticipation that these countries would join the euro grew, their nominal yields converged to those of low-inflation countries, such as Germany, on the expectation that EMU would deliver a stable macroeconomic environment. To the extent that this fall reflected a decline in the inflation risk premium, this translated into a decline in real yields. There is evidence that these declines have fed through to commercial rates, and so lowered the cost of capital in these countries.

3.13 As Chart 3.4 illustrates, the UK also experienced a fall in credit risk-free rates during the 1990s. The implications of possible UK entry for the UK credit risk-free rate are explored in more detail below.

Implications of EMU entry for the UK credit risk-free rate

3.14 Following the 1997 reforms of the UK macroeconomic framework, current market expectations are that the UK will maintain stable and low inflation; this means nominal credit risk-free rates in the UK are already low and are close to those of the euro area. In fact, as Chart 3.7 shows, the differential between UK government bonds (gilts) and German government bonds (bunds) at the 30-year maturity level has reversed since 1997. Table 3.1 summarises the evolution of these differentials. In May 1997, 30-year gilts were priced at 63 basis points over bunds; in February 2003, 30-year bunds were 31 basis points over gilts. Declines in the UK gilt spread over bund yields have also been noticeable at five and ten-year durations.

3.15 This suggests that the UK will not see a decline in credit risk-free rates to anything like the degree experienced by countries such as Spain and Italy. However, there would be important implications for UK government bond yields of entry into EMU. Many of these reflect structural factors specific to the UK bond market which would be affected by UK entry to EMU.

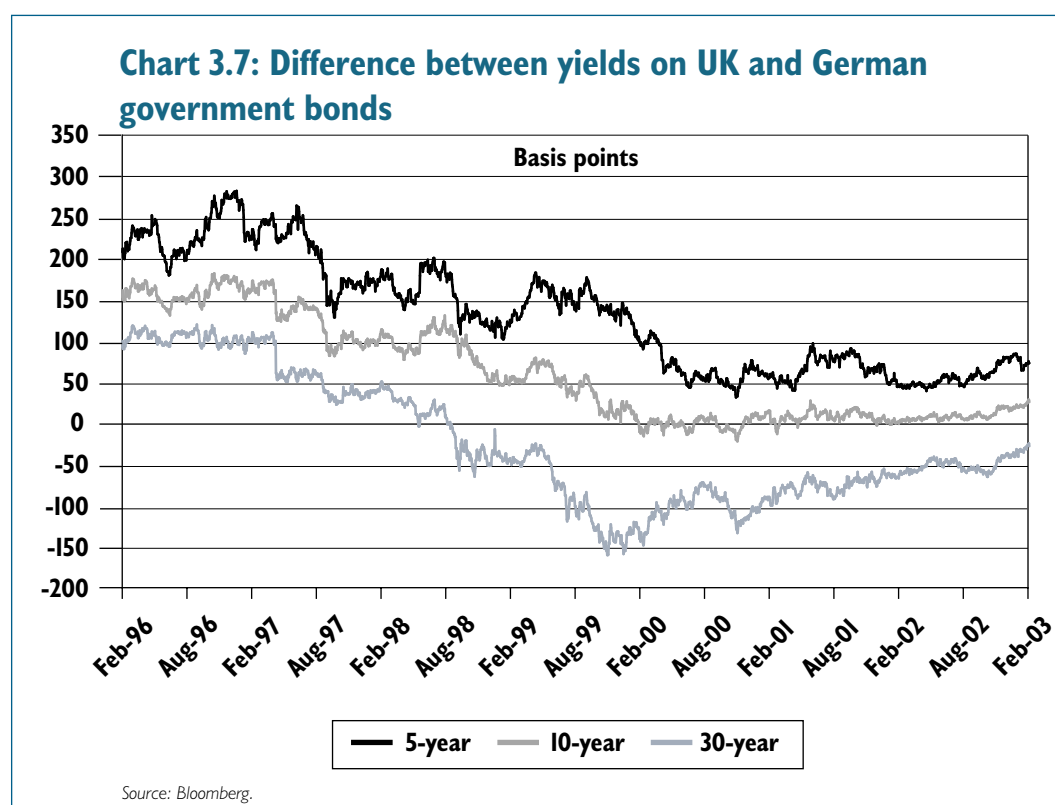


Table 3.1: Summary of differential between UK and German government bonds

Basis points	5-year	10-year	30-year
May 1997	+226	+133	+63
October 1997	+145	+88	+28
February 2003	+71	+23	-31

Note: A positive differential indicates higher UK yields.

Source: Bloomberg

3.16 A number of factors are responsible for 30-year UK gilt rates falling beneath those of bunds.³ Economic theory predicts that inflation expectations are a key driver of yields, and there is evidence that the narrowing of the gap between inflation expectations in Germany and the UK, due to the greater stability provided by the new UK macroeconomic framework, has reduced gilt rates at all maturities.

3.17 However, a number of UK market-specific factors have also played a role:

- **on the supply side**, improving government finances, and a limited supply of substitute corporate securities has led to a tightening of gilts supply;⁴ and
- **on the demand side**, there is strong demand for gilts as a result of a number of UK-specific institutional factors relating to the wider coverage of private pension funds in the UK. For example, the Minimum Funding Requirement, Guaranteed Annuity Options and FRS17 have created incentives for UK pension funds to hold long-dated UK government bonds.

Implications of UK entry for the gilt-bund differential and the UK yield curve

3.18 Entry into EMU would eliminate currency risk between UK government bond markets and those of the euro area. It would also mean that the UK and euro area would share a common official short-term interest rate. Given this, if all other things were equal, one would expect the UK government bond yield curve to closely match those of other large AAA-rated government bond markets such as Germany, France and the Netherlands. In theory there could be a negative impact on the UK's credit rating from joining the single currency, as participant countries can no longer use central bank borrowing to finance government spending. However, countries retain the ability to meet debt payments with tax revenue and no participant has experienced a downgrade in credit rating since the introduction of the single currency.

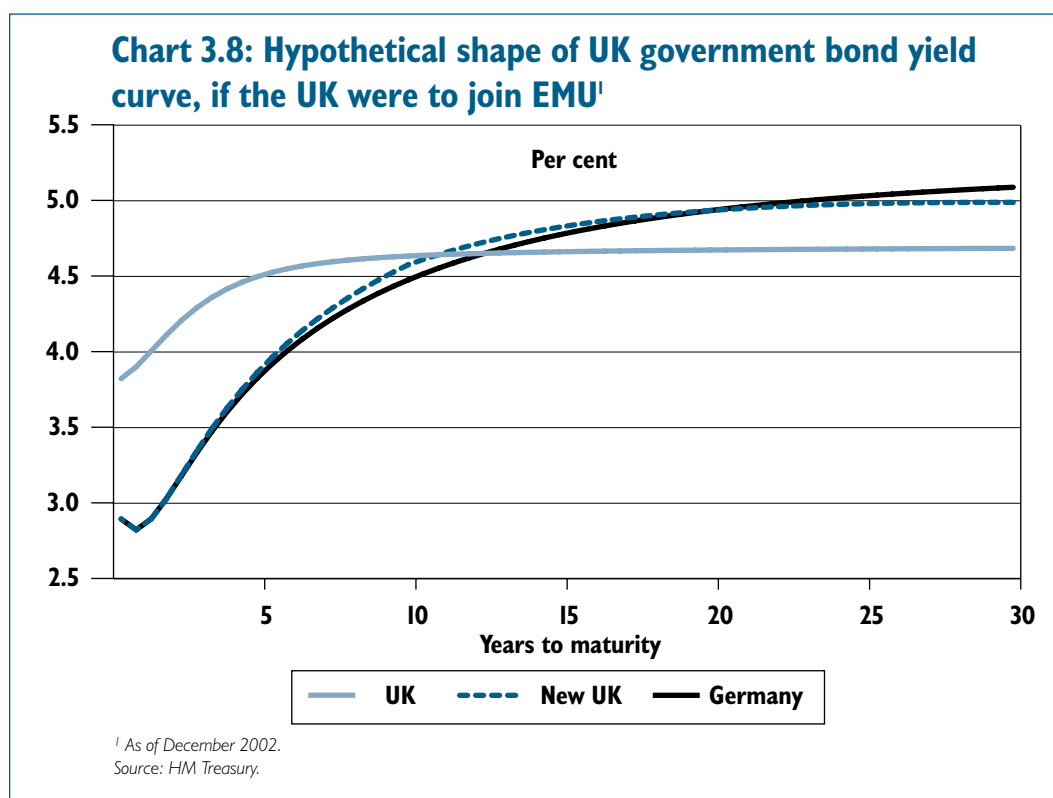
3.19 By entering the single currency, UK investors would have access to a wider pool of assets to choose from. For example, institutional investors who currently hold long gilts may wish to purchase instead, without any currency risk, German or French long-maturity government bonds if the yields are higher. Equally, euro area investors will have a bigger pool of assets if the UK enters EMU. This could lead, based on the assumptions in Chart 3.8 below, to net flows into UK assets at the short end. Overall supply and demand of savings and investments should be unaffected, but there may be distributional effects. The impact on different durations of debt is discussed below.

³ For a fuller explanation see Brooke et al. (2000).

⁴ The UK's fiscal deficit of 2.9 per cent of GDP in 1996-97 became a surplus of 3.9 per cent in 2000-01.

3.20 How close the UK's yield curve would map onto those of other AAA-rated governments would be in part dependent upon the liquidity and benchmark status of the UK's government bonds in relation to other AAA-rated government counterparts.⁵ The status of UK government bonds in the euro area market would depend upon a number of factors including:

- **the size of the market.** The UK has a longer average maturity of debt than other EMU issuers. If the UK were to join EMU, its bonds would constitute around 32 per cent of the resulting total market stock above ten years.⁶ This dominance should have a favourable impact on the liquidity and the benchmark status of gilts of long-term maturity, and could lead to the long end of the UK yield curve lying beneath the bund curve;
- **investor inertia.** Currently, UK pension and life funds are the largest holders of long-dated gilts. If the UK enters EMU, these institutions could enjoy a yield pick-up by switching to other EMU government bonds without an increase in currency risk (as mentioned above, institutional factors currently create incentives for UK pension funds to hold long-dated gilts). This would result in switching from gilts to bunds and the UK yield curve matching closely the long end of the bund curve. However, movement by UK pension and life funds away from long-dated gilts may be slowed by their unfamiliarity with diversifying into other markets and investor inertia; and
- **better long-term prospects for UK creditworthiness.** The UK Government has better long-run financial prospects than its AAA-rated German and French peers, as it has a lower net debt-to-GDP ratio and a significantly lower level of unfunded pension liabilities in comparison to Germany and France. Gilts should therefore have slightly better credit risk than these countries' bonds.



⁵ Until now the liquidity premium on government bonds has been ignored. However, as mentioned in the introduction, government bond yields include a liquidity premium, reflecting the risk of being unable to find a buyer or seller on the market.

⁶ Against 14 per cent for Germany, 17 per cent for Italy and 13 per cent for France.

3.21 If the UK were to enter EMU, the factors above suggest gilts might become the benchmark on bonds of a maturity of over 15 years, leading to a negative differential between bund and gilt yields at the long end of the bond market. UK yields might be higher than Germany's at the ten-year maturity area due to the liquid bund futures contract, which gives bunds benchmark status in this maturity area.

3.22 For the purposes of illustration, Chart 3.8 projects the UK yield curve if the UK enters EMU on the assumption that over the one-to-ten year maturity period UK yields would fall from their current levels, as expectations of short rates harmonise to those of the euro (proxied by German bond yields).⁷ UK yields are then projected to rise relative to their current levels out to 30-years as UK pension and life funds sell long gilts in order to diversify into long euro government bonds. In essence, upon joining EMU, this projection suggests that the UK yield curve would steepen. This projection is based on the assumption that UK entry has no impact on bund yields. If this does not hold, then the change in the UK yield curve would be less strong than projected (demand for long duration euro area sovereign bonds from UK funds could result in the flattening of the euro area yield curve).

**Implications for
the corporate
cost of capital**

3.23 A steepening of the UK yield curve, such as is projected here, would lead to an increase in yields on medium and long-dated gilts, and a decrease for short-dated gilts. The impact of this on the cost of new corporate debt will be dependent upon corporate issuance strategy. If corporate fundraising is focused at the short end of the curve, then the reduction in short-term yields would provide an opportunity to reduce the cost of financing, assuming that corporate issuance is priced at a constant spread over the government rate. These benefits would be tempered if corporates issue along the medium and long parts of the curve where, on this projection, yields would rise if the UK joins EMU. While most UK corporates issue bonds at or below 15-year maturities in sterling, a significant number (46 per cent) are issued at maturities over 15 years. In contrast, the average maturity of euro-denominated corporate bonds, whether from the UK or all issuers, was five years.⁸ This could reflect corporates taking advantage of the relative positions of euro area and UK government bond yield curves, although corporates issuing at long maturities face credit risk premia that heavily influence yields.

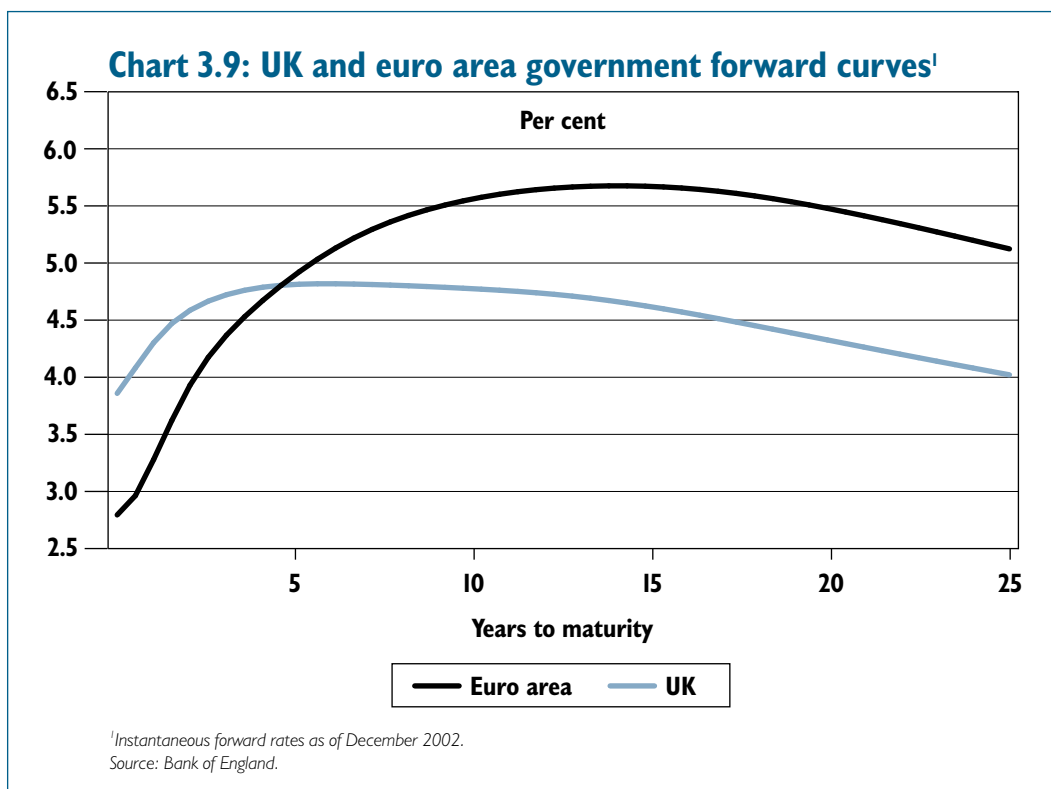
3.24 As there is currently substantial issuance at the shorter end, this projection suggests that EMU entry could lead to a lower cost of capital, at least in nominal terms. Plus, the current pattern of issuance in euros and sterling suggests that corporates would react to a fall in UK government yields at the short end by increasing issuance at shorter maturities and moving away from long-maturity issues. The benefits of this would have to be traded off against the increase in roll-over risk (i.e. the risk involved in continually issuing new debt) that might arise from this strategy.

3.25 In a historical context the possible gains from a fall in UK short-term yields described here are not large. For example, Chart 3.3 shows that over the 1990s, long-term UK government bond yields fell from around 12 per cent in 1990 to current levels of around 4.5 per cent.

3.26 Moreover, the current relative position of euro area and UK short-term interest rates is largely determined by the cyclical position of the economy. While current yields point to a nominal decline in short rates if the UK were to enter EMU, this picture will change with the prevailing economic circumstances. Furthermore, this would only represent a decline in nominal yields. There is little to suggest that the real short-term risk-free rate in the UK would decline in EMU. The EMU study *Policy frameworks in the UK and EMU* by HM Treasury, explains that the inflation targets of the monetary authorities in the UK and euro area are

⁷ The hypothetical UK gilt short-rates under EMU entry in this chart (3.9 per cent for 5 year bonds) are still below euro short rates currently observed in the market for 5 years' time (4.8 per cent, see Chart 3.9), meaning that Chart 3.8 assumes that the current market predictions of euro short rates are not fulfilled.

⁸ Data as of end 2002.

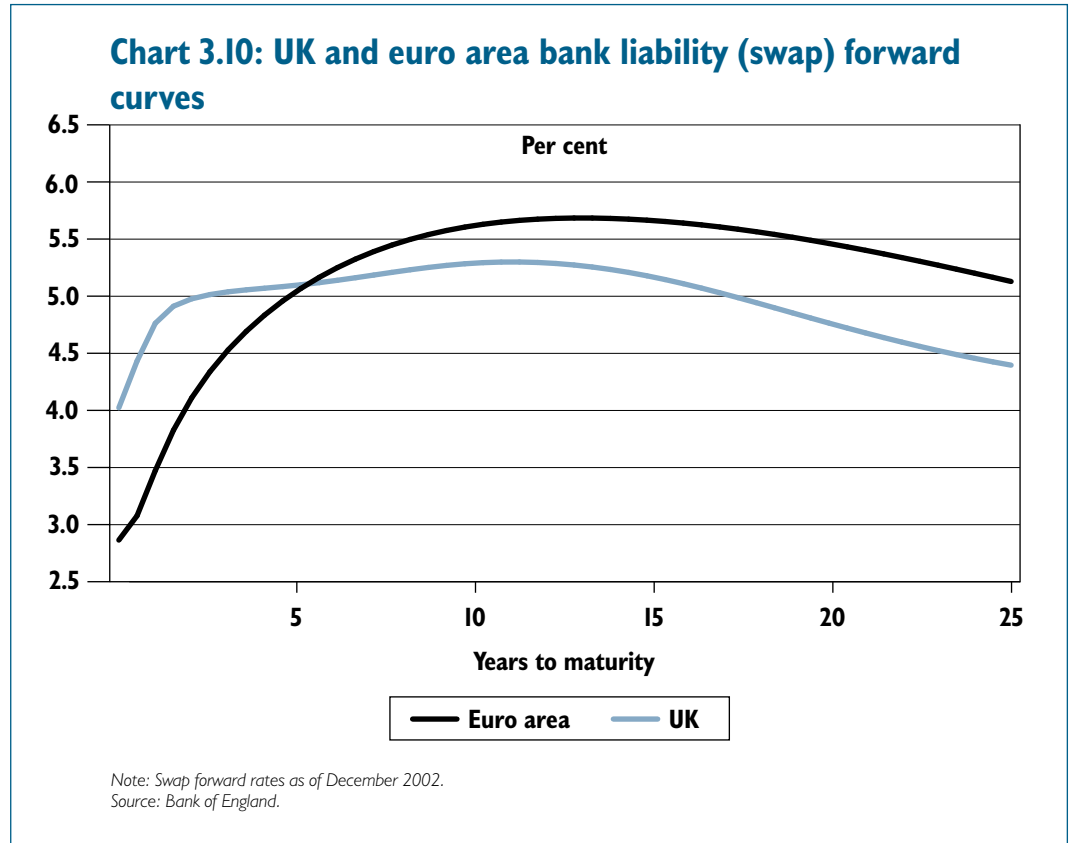


probably very close. This means there is unlikely to be a significant difference in the current expected rate of inflation whether the UK remains outside or were it to join EMU. Equally, the macroeconomic reforms of 1997 are expected to maintain low and stable inflation in the UK, which means that there is likely to be little significant difference in the inflation risk premium factored into the rate of return on UK and euro area assets.

Using forward rates to compare government yields

3.27 These issues can be explored further by using an alternative measure of expectations of government bond yields – the forward yield curve. Chart 3.8 plots a spot rate curve – the interest rate applicable today on government bonds maturing on dates from one year to 30 years ahead. The forward curve in Chart 3.9 plots the implied short-term interest rate that the market expects to apply across a range of dates from six months to 30 years ahead. The two curves are closely related. The yields in the spot rate chart, for example for ten years ahead, will be the average of the rates in the forward curve from now until ten years hence. Forward rates are not known with certainty so there will often be a ‘term premium’ between forward and short rates, reflecting perceptions of the risk that actual short rates will be different from forward expectations.

3.28 On the forward curve, the point at which UK and euro rates cross and UK short rates become lower than euro rates is around five years. This compares to around ten to 15 years in the spot curve. The higher UK forward rates until around five years in Chart 3.9 contribute to higher UK spot rates to around ten years in Chart 3.8 (as future spot rates are the average of forward rates). Out to around five years expectations of higher UK rates may reflect cyclical factors. However, the market is unlikely to have a view on relative cyclical positions further than five years from now. Instead, the forward curve at longer time horizons may reflect structural factors related to the UK gilt market, such as are discussed above. In short, this analysis suggests that there is no expectation that the current cyclical factors leading to lower euro area short-term rates relative to the UK will be sustained into the longer term.



Swap rates as an alternative proxy for risk-free rates

3.29 These comparisons of UK and euro area government bond yields are used on the assumption that government bonds are an accurate proxy for risk-free rates. However, as described above, supply and demand in the gilt market is currently influenced by UK-specific institutional factors, such as inelastic demand from pension funds. It can be argued that these factors depress the yield on gilts below the ‘true’ credit risk-free rates, making UK government bond yields a less accurate proxy of risk-free rates. Government yields may also be lower than the risk-free rate to the private sector because holding bonds can facilitate cheaper borrowing in the repo market.

3.30 The swap rate is the rate at which a variable interest rate cashflow is swapped for a fixed rate. Cooper and Scholtes (2001) argue that swap rates in the inter-bank market act as a more consistent measure of the credit risk-free rate, as the market is very large and does not face the supply constraints seen in the UK government bond market. Moreover, it is easy to take long or short positions using swap contracts, and there are no obvious regulatory distortions affecting swap pricing. Swaps do however bring some exposure to counterparty and general banking credit risk, though this is generally small in the inter-bank market.

3.31 Using this alternative measure of the risk-free rate reduces, but does not eliminate, the differences between UK and euro risk-free rates. Comparing the forward curve for UK and euro swap rates (Chart 3.10) with the forward curve for government bond yields (Chart 3.9), indicates that the gap between long-term rates is much reduced in the swap curve. This is due to the removal of much of the distortion to long-term gilt yields from the institutional factors discussed above.

Conclusion on the impact of EMU entry on the UK credit risk-free rate

3.32 Through macroeconomic reform, the UK has established a credible low-inflation environment which has contributed to a steady decline in long-term credit risk-free rates. This means EMU entry would not offer the UK the significant falls in nominal credit risk-free rates seen in EMU countries with historically high inflation. It is likely that if the UK were to enter EMU, there would be close convergence of the UK government bond yield curve with that of existing EMU countries. This may lead to a fall in short-term UK yields and a rise in long-term yields. However, these changes are relatively small in historic terms. Moreover, the current differential in short-term yields is largely a result of the current cyclical positions of the UK and euro area economies. It is difficult to argue that it would translate into a significant fall in the real cost of capital for UK firms.

4

IMPLICATIONS OF EMU ENTRY FOR THE MARKET RISK PREMIUM

The size and efficiency of financial markets will affect the size of the market risk premium component of the cost of capital. There are signs that the euro has prompted increased integration in the euro financial market. However, there is not yet sufficient evidence to be able to determine the impact of this on the market risk premium.

Large UK firms can access the euro market from outside EMU at relatively low cost. However, the removal of exchange rate risk and transactions costs that EMU entry would bring, alongside the removal of some institutional constraints on foreign currency holdings, would increase access at the margin.

4.1 This section considers whether EMU has led to a reduction in the **market risk** premium component of the cost of capital. There are two key ways in which EMU might reduce the market risk premium. First, if EMU encourages investors to diversify portfolios across national borders this could reduce the **credit risk** component of the market risk premium. Second, **liquidity risk**, which is the risk of being unable to find a counterparty for a transaction, may be lower in a larger and more integrated market.

The potential impact of EMU on credit risk

4.2 As Stulz (1999) explains, in a world of fully-segmented national capital markets, each country's investors would have to bear the full risk of their country's economic activity. The market risk premium they would demand for this would increase with national market risk. With capital market integration, domestic investors are able to diversify their risk profile by holding foreign assets. Because some of the credit risk of domestic and foreign assets is likely to offset each other, investors can hold an international portfolio which has the same expected returns as previously but with lower risk. Therefore investors will demand lower risk premia from firms when they are able to diversify. In practice, investors who invest purely in their national securities markets are likely to enjoy some exposure to the international economy, as some domestically-listed firms will operate across borders.

The potential impact of EMU on liquidity risk

4.3 Aside from potentially reducing investors' credit risk exposure, EMU may reduce liquidity risk, which represents the risk of being unable to find a buyer or seller for an asset at a reasonable price. Liquidity risk in an integrated EMU financial market is likely to be lower than in a segmented national market, simply because the size of market is larger and the range of market participants is broader. Lower liquidity risk should translate into a lower market premium and so a lower cost of capital for firms.

The potential gains from market integration

4.4 The gains from financial market integration are potentially large.¹ This is why it is important that financial market integration in the EU continues to develop, whether the UK is inside EMU or not, through efforts such as the Financial Services Action Plan (FSAP). Recent analysis for the European Commission (London Economics, 2002) suggests that full integration would lead to a fall in the cost of EU equity capital of around 50 basis points, and of the cost of EU debt of around 40 basis points, which it is estimated would boost the level of EU GDP by 1.1 per cent in the long run.

Will EMU promote financial market integration...

4.5 The question addressed in this section is whether were the UK to enter EMU, there could be additional cost of capital savings for UK firms through the market risk premium. This clearly depends on the degree to which a separate exchange rate acts as a barrier to integration. Research generally suggests other factors are more important constraints, but that at the margin the exchange rate is likely to act as a barrier.

¹ See Stulz (1995) and (1999) for further analysis of the potential gains from international financial market integration.

...related to home bias **4.6** For example, a puzzle in financial economics is that investors hold financial portfolios which are heavily weighted to domestic assets, and have much lower levels of international assets than optimal portfolio theory suggests they should. This home bias means they seem to miss out on the benefits of international diversification discussed above.

4.7 There are a number of reasons why EMU might reduce home bias among euro area investors. The removal of exchange rates within the euro area removes a transaction cost to investing overseas; and it also reduces exchange rate risk on European investments. Furthermore, many investment funds are constrained by regulation to keep a certain proportion of their assets denominated in domestic currency. The institutional set up of EMU, such as the European Central Bank's (ECB) cross-border money market payment system (TARGET), may also promote integration.

4.8 It is possible that UK EMU entry would provoke a one-off change in net flows in line with the one-off reduction in some of the barriers to cross-border investment, as institutional investors diversify into UK assets and UK institutions move into euro area assets. If UK institutions have already diversified more than their euro area counterparts, flows into the UK might exceed out-flows. Where investors are holding UK assets as a result of currency diversification, there may also be a one-off impact if joining EMU provokes a sell-off of some of these assets.

4.9 Research has found that currency risk on its own does not explain home bias (for example, see Brealey *et al.*, (1999). Uncertainty about exchange rates can be hedged through a variety of financial products. Currency risk may not be undesirable; it may actually enable investors to diversify risk in their portfolio. A more likely explanation for home bias is that there are significant transaction costs and information costs to holding foreign assets. EMU in itself will only reduce transaction costs to the extent that it removes currency exchange and hedging costs; and it will only reduce information costs through the increased price transparency that comes from having a single currency. EMU could indirectly promote greater integration if it acts as a catalyst for the development of a more efficient regulatory environment in the EU financial markets, or promotes integration of financial market infrastructure, such as trading and settlement systems. Both these developments would be likely to lead to lower cross-border transaction costs.

4.10 The impact of integration on the cost of capital is not all one way. If EMU promotes economic convergence in Member States, this could reduce the benefits of portfolio diversification. If national economies move together more closely, then domestic and foreign risk is less likely to be offset. In such circumstances, investors may find that portfolio allocation strategies based on sectoral rather than country distributions are superior, an issue which is examined in further detail in later sections.

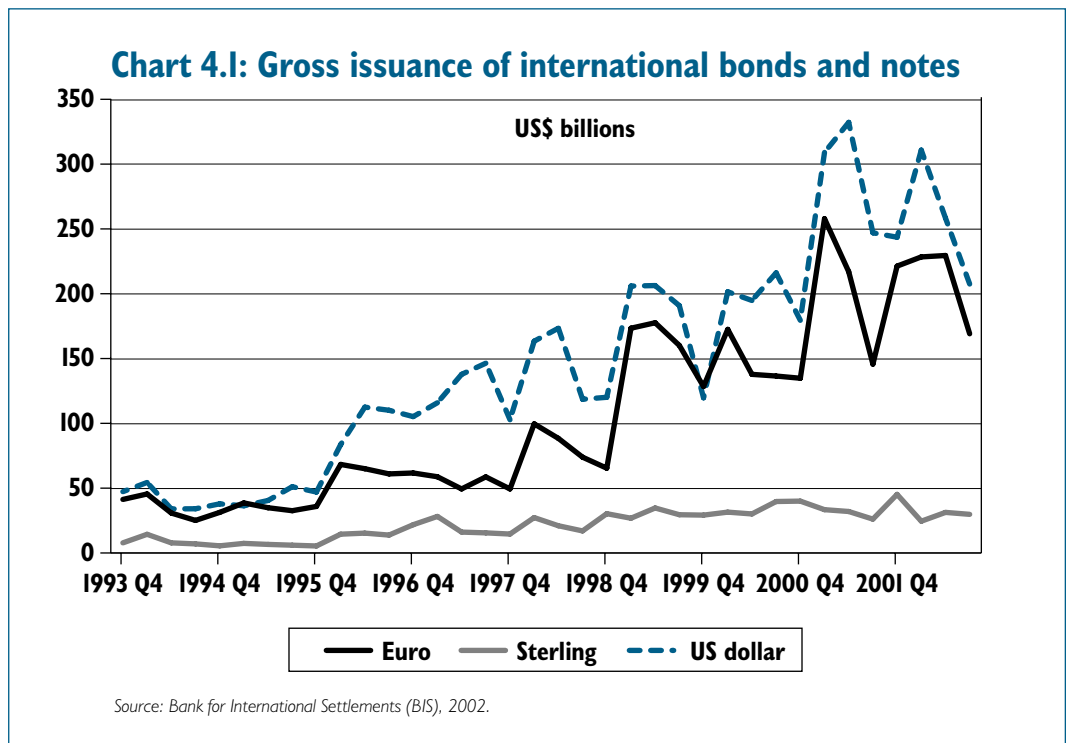
Structure of the remainder of this section

4.11 To address these issues, this section first examines the trends towards integration in the euro area financial markets which could lead to lower credit and liquidity risk. It then looks at two important indicators of integration, transactions costs and portfolio diversification, which could help to bring down the cost of capital in the euro area. The section ends by comparing estimates of the market risk on bonds and equities in the euro area and the UK, as a measure of whether the UK could benefit from a reduction in market risk by joining EMU.

Integration of euro area financial markets

4.12 A number of indicators suggest the euro financial market has become more integrated since EMU, though regulatory and structural constraints are still a hurdle to many cross-border transactions. The remainder of this section examines the key indicators in more detail (for more detail see Bank of England, 2002).

Developments in EMU bond markets **4.13** The introduction of the euro is generally seen to have had a positive impact on the euro-dominated corporate bond market. The market has grown strongly since 1999 (see Chart 4.1), driven primarily by issuances of commercial bonds, although these have mostly been issued by the financial sector. The average size of issues has also increased, as has the range of credit ratings offered. Factors other than the introduction of the euro have played a part in these trends – other international markets also witnessed increases in issuance in 1999. One important factor was a market rebound after the Russian debt default and the Long-Term Capital Management (LTCM) crisis in late 1998. In addition, the sector received a boost from several large issues from the telecoms sector, used to finance the purchase of third generation licences. However, in 2002 the corporate bond market fell back due to the deteriorating global economic environment.



High-yield bonds and venture capital **4.14** One area in which EMU may have a significant impact on the cost of capital is by increasing access to finance for smaller, higher risk firms. A well-developed market for high-yield bonds would increase access and potentially lower the cost of capital for firms which may not previously have been able to borrow on the bond market.

4.15 The evidence thus far on the development of the euro high-yield market is not convincing. Table 4.1 presents the volume of euro-denominated bond issuances by rating. This indicates an increase in the share of the middle range of issues with credit ratings of A and BBB. An important factor behind this has been the large volume of issues from the telecoms companies, as well as some downgrading of previously higher rated bonds. By contrast, there has been little sign of much activity at the high-yield end of the market to date. It may be that UK entry to EMU would have beneficial spillover effects for smaller, higher risk firms in the euro area as the UK has a relatively well-developed venture capital industry (see Section 5).

Table 4.1: Shares of euro-denominated bond issues by rating of issue (based on volume)

Per cent Year	Bond rating						
	AAA	AA	A	BBB	BB	B	CCC
1996	64.5	25.6	8.3	0.7	0.3	0.7	0.0
1997	58.5	28.5	9.2	1.2	0.8	1.5	0.0
1998	55.0	25.0	15.5	2.1	1.2	1.4	0.0
1999	35.8	26.9	25.7	9.5	0.3	1.5	0.2
2000	40.3	27.3	27.0	3.9	0.2	1.0	0.3
2001 ¹	32.4	24.0	35.3	7.9	0.7	0.7	0.1

¹Up to third quarter.

Note: Data compiled from Thomson Financial Securities' IFR Platinum bond database, which covers mainly international issues which are self-described as such in the prospectus, stating that the issuer targets investors outside its home country, or that are denominated in a different currency than the home currency of the issuer, or that the issue is underwritten or co-managed by an international investment bank. See Santos and Tsatsaroni (2002) for more information.

Source: Santos and Tsatsaroni, 2002.

Developments in EMU equity markets

4.16 Equity issuance in the euro area rose sharply in 1999 and 2000 compared to the pre-euro period. New equity worth \$86 billion was issued in 2000 Q1-Q3, compared with \$108 billion in full year 1999 and an annual average of \$56 billion between 1995 and 1998.² Factors aside from the introduction of the euro explain this increase. Until 2000, the value of European equity markets was rising sharply, mirroring those in the US, and this encouraged equity issuance. In addition, a substantial proportion of new issuance was in the telecoms and technology sectors, propelled by rapid worldwide growth in these areas over the past couple of years. Increasing merger and acquisition (M&A) activity in the euro area (which is, in part, a consequence of the introduction of the euro) has also led to increased equity issuance. Since 2000, equity markets in the euro area, US and UK have fallen substantially, especially in the telecoms and technology sectors, confirming the importance of sectoral developments in the market, and making it all the more difficult to isolate any effect from the start of EMU.

4.17 The growth of new equity issuance coincided with the continued expansion of EU mutual funds: in 1992 EU mutual fund assets equalled 8.2 per cent of EU GDP, by 1998 this had risen to 31 per cent.³ The growth expected in personal savings through pension funds and mutual funds should continue to provide finance available for investment in the euro area equity market in the future.

Developments in EMU financial institutions

4.18 Running alongside the general process of financial market integration has been a restructuring and rationalisation of the banking and financial services industry. This has not only been in response to the euro, but to rapid developments in liberalisation, technology and globalisation in the financial services industry. There have been a significant number of major banking mergers and mergers between banks and other financial companies such as insurance firms; the merger between Allianz and Dresdner is a recent example. These issues are considered in more detail in the EMU study by HM Treasury *The location of financial activity and the euro*.

4.19 Most of these mergers have been between companies from the same country. Cross-border mergers have so far been limited. The wholesale banking sector is already very concentrated, limiting the possibilities for cross-border mergers. More scope exists for cross-border mergers between commercial banks, and a few of these have taken place, but significant barriers remain:

- legal and regulatory rules vary considerably between countries;
- for cultural reasons, customers may prefer local banks;

²Bank of England (2000).

³Bank of England (1999).

- savings may not be as great as for domestic mergers where overlapping services can be reduced; and
- availability of information on credit history and current financial characteristics may be limited.

4.20 For example, in Germany the complex cross-ownership structure of the major banks largely insulates them from the threat of consolidation. The tax position of capital gains also affects this structure.

4.21 Increased concentration in financial services could take the market in one of two directions. If mergers are driven by efficiency gains then they should result in lower costs and, if these savings are passed on to customers, to a reduced cost of capital. Cross-border mergers may increase perceived contestability in European markets, which should also reduce the cost of capital. On the other hand, concentration might reduce competitive pressures, in which case margins could rise, leading to an increase in the cost of capital. Concentration may also have different effects on different market participants. If the development of large common trading platforms makes it more difficult for smaller issuers to tap the euro markets, their costs could rise.

4.22 Corvoisier and Groop (2001) examine the impact of deregulation and concentration in the EU banking market over the period 1993 to 1999. They find that M&A activity has increased banking concentration over this period, and that this increased concentration is correlated with higher interest margins for bank loans. This contrasts with the market for savings deposits and time deposits, where increased concentration is correlated with lower margins. Corvoisier and Groop argue that the market for loans is more open to collusion as it is an information intensive product. Firms familiar with the local market may have a comparative advantage that allows them to extract a rent and reduce competition.

4.23 The ECB (2000) finds that competitive pressures have forced euro area bank lending margins down, for both the household and corporate sectors. The ECB concludes that in periphery countries, such as Ireland, Italy, Portugal and Greece, part of this fall is due to the convergence of market rates to EMU levels. The ECB believes an increase in banking competition is also an important factor. There are significant levels of foreign entrants to banking in Ireland, the UK and Nordic countries in particular, with entry facilitated by new technology such as Internet banking. In so far as this indicates low barriers to entry already, the additional competitive impact of EMU membership would be muted.

**Developments in
euro financial
market
infrastructure**

4.24 Financial market infrastructure has been highlighted as a significant factor affecting the development of the euro financial market. Without a well-functioning euro financial market infrastructure it would be difficult for the UK, whether in or out of EMU, to benefit from the lower cost of capital associated with lower credit risk and liquidity risk premia. There are three main infrastructure elements: trading platforms, clearing houses and settlement systems.

4.25 Trading platforms bring together buyers and sellers to agree on the volume and price of transactions. Integration of trading platforms could reduce liquidity risk by increasing market size; potentially it could also reduce transaction costs through economies of scale. In the equity markets, the main development since the start of EMU has been the establishment of Euronext, the merger of the Paris, Brussels and Amsterdam stock exchanges. The Portuguese exchange has now joined Euronext; and in early 2002 Euronext purchased the London derivatives exchange, LIFFE. In 1999, the Stockholm and Copenhagen exchanges agreed to create a common trading platform. They have subsequently been joined by Oslo and Reykjavik. In the bond market, Euro-MTS is a common platform which has been created for trading the government bonds of Belgium, Finland, Germany, Greece, Spain, France, Italy, Ireland, Portugal, the Netherlands and Austria.

4.26 A clearing house's main function is to assume and manage risk by acting as counterparty to both sides of a transaction. If the buyer cannot pay or the seller cannot deliver, the clearing house has to fulfil the obligations of the defaulting party. Clearing houses have traditionally provided their services for derivatives markets. However, recently some, including London Clearing House (LCH) and Clearnet, have also started to act as central counterparty for cash markets.

4.27 Finalisation of a transaction requires settlement, which involves the actual transfer of cash and securities between participants. Before EMU, European settlement systems were based on a framework of national central security depositories (CSD) in each Member State, plus two international depositories (ICSD), which were originally established to settle eurobonds. Two separate mergers so far have taken place: Cedel, a ICSD based in Luxembourg, merged with Deutsche Börse Clearing, the German CSD, to form Clearstream (with Deutsche Börse subsequently buying out the Cedel shareholders); while Euroclear, which settles trades for Euronext's exchanges, acquired the national CSDs of France, Belgium and the Netherlands, and more recently merged with London's Crest. The new Euroclear Group will handle about 60 per cent of trades in leading European equities and more than 50 per cent of fixed income trades.⁴

4.28 In addition to these three main infrastructure elements, there are also payment systems for interbank unsecured money market transactions. TARGET, the ECB's cross border payment system, and the Euro Banking Association's (EBA) EURO1 are the two pan-European euro payment systems which, by allowing commercial banks to manage euro liquidity in a single pool, are contributing to the integration of euro trading and settlement in this area of the financial markets.

4.29 In its first report on clearing and settlement, the Giovannini Group⁵ claimed that while the settlement of domestic trades in the EU was similar to the analogous service in the US, the settlement of cross-border trades was substantially less efficient than the settlement of domestic trades. The Group concluded that there were barriers to the efficient delivery of cross-border settlement services arising out of differences in technical requirements/market practices, tax regimes and legal systems across Europe.

4.30 There is an ongoing debate about whether EMU infrastructure should move in the direction of concentration or competition. Supporters of concentration argue that network externalities are generally seen at all three levels of the infrastructure: trading, clearing and settlement. At the level of trading, a dominant exchange pools liquidity. This should make the market-place more efficient by reducing the spreads on individual stocks, ensuring that prices properly reflect supply and demand, and making the market more robust in the face of shocks. On the other hand, a single concentrated supplier may be less efficient than if there were competition between several providers of such services, particularly as competition can co-exist with liquidity. Most traders now have access to technology that allows each individual trade to be routed to the execution venue where they will obtain the best price.

4.31 At the level of clearing, a dominant clearing house could, for example, help users save on capital by taking account of offsetting risks across a wide range of trades in setting margin requirements. However, a dominant clearing house would concentrate counterparty risk in one institution. It would need to manage its risk very effectively to sustain the stability of the financial system. At the level of settlement, the London Stock Exchange argued in its response to the Giovanni Group's report⁶ that currently there was no meaningful competition between CSDs. However, technological change and potential liberalisation of national laws, which have restricted where securities may be settled, might encourage competition with the existing and dominant CSDs.

⁴Based on pre-merger volumes.

⁵European Commission, DG Economic and Financial Affairs (2002).

⁶London Stock Exchange (2002).

4.32 There is also debate over whether infrastructure should be horizontally or vertically integrated. A horizontal structure implies that there is separation of the ownership of trading, central clearing and settlement. A vertical structure implies common ownership of all three elements of market infrastructure.

Impact of market developments on transaction costs and portfolio diversification

4.33 As already suggested, EMU may promote the development of a more integrated financial market and thus a lower risk premium due to a lowering of transaction costs, the removal of currency costs and risk, and increased competition in a larger market. An indicator of the degree of integration in the euro market is the extent to which investment funds are diversified across national borders. Therefore, this section considers the impact of recent market developments on transaction costs, hedging costs and portfolio diversification.

Transaction costs **4.34** Research suggests that the developments in the EMU financial market outlined above may have helped to reduce market transaction costs. At the start of EMU, transaction costs for cross-border financial trades in the euro area were significantly higher than domestic ones. Adjoute *et al.* (1999) estimate that cross-border trades cost ten to twenty times more than domestic ones in the EU. They attribute this to the complex and inefficient structuring of cross-border payments, the lack of a delivery versus payment system, which increases transaction risk, and the longer time and greater custody risk involved between trade execution and completion due to the number of intermediaries involved. According to a report on the benefits of financial integration for the European Commission (London Economics, 2002) the cost of equity capital could fall by around 50 basis points if there was full European financial integration, mainly through a lowering of transaction costs.

4.35 Murray (2001) asserts that the US enjoys significant cost savings from operating a single equity settlement and clearing house, compared to the 26 which operate in the EU. There is some evidence of falling equity commissions. In the euro area, Mann and Meade (2002) find that pan-European commissions for domestic equity transactions fell and converged between 1997 and 2001.

4.36 EMU may also lead to a reduction in transaction costs through increased competition in the retail and investment banking sector,⁷ though as discussed above, increased banking concentration following the wave of euro area bank mergers may offset any increase in competition. In the euro-denominated bond market, evidence from BIS (2000) suggests that there has been an important decline in underwriting fees. Before EMU, the bond market was largely segmented. Investment banks faced relatively high costs of entry into each market, as they required high levels of analytical expertise relative to the size of the market. Now the EMU bond underwriting market can be seen as more contestable.

4.37 BIS (2000) estimate that the average fee for international bonds denominated in euros fell by around 1 percentage point (as a percentage of the nominal amount of the issue) over the period 1997 to 2000 – very close to average gross fees in the US dollar market. Santos and Tsatsaronis (2002) also find that underwriting fees for euro-denominated corporate bonds are now very close to those of US dollar-denominated bonds.

4.38 There has been some evidence of *increased* transactions costs in the foreign exchange markets since the introduction of the euro (Detken and Hartmann, 2002), with some commentators suggesting that the single currency increased transparency in spot trading and thereby inventory risk, forcing dealers to increase spreads. However, it appears likely that this increase has appeared as a result of quoting conventions on spreads, which meant that a pip⁸ became a larger proportion of nominal exchange rates on the dominant dollar/euro trade.

⁷ See Jean Dermine's contribution to the EMU study *Submissions on EMU from leading academics*.

⁸ A pip is the lowest spread currently possible – one hundredth of a US cent per euro.

Hedging costs 4.39 Accessing euro area markets may be cheaper for UK firms if the UK were in EMU because of the removal of hedging costs. There would also be ‘in-house’ savings in the form of lower expenditures on specialist personnel engaged in the management of exchange rate risk between the two currencies.

4.40 Exchanging foreign currency can be done either at the spot rate or at a forward rate in order to hedge against unexpected currency movements. The cost to a firm of spot transactions is the spread between the market rate and the rate available to them through a bank, plus any commission charged. For large deals this spread could be next to nothing, or even used as a loss leader. Unlike spot rate transactions, the cost of forward rate transactions must also take into account credit risk, which will depend on the size of the deal and the creditworthiness of the company concerned.

4.41 Small and medium-sized enterprises (SMEs) may find hedging costs more costly than larger firms as:

- they do not necessarily go to the best provider because of their relative lack of knowledge and expertise;
- the size of deals they require means they have less leverage with the provider to negotiate a better deal; and
- for forward transactions, they may be thought of as worse credit risks than larger firms.

4.42 Section 5 considers the implications of UK entry to EMU for SME financing.

Portfolio diversification

4.43 Evidence suggests that portfolio diversification in the euro area has been taking place, but perhaps not as rapidly as was generally expected before EMU. There are a number of factors which could explain the lack of full diversification. First, many countries have retained regulations which restrict the foreign holdings of pensions and other investment funds. Second, as discussed above, the lack of a fully-integrated financial market infrastructure means there are still often higher transaction costs involved in cross-border activity. Third, fund managers may face informational costs when investing overseas, due to greater knowledge of local markets. Finally, as selling existing holdings is likely to crystallise capital gains, diversification may only take place with new money. Portfolio diversification may turn out to be a longer-term phenomenon, as firms gradually restructure their operations and products on a pan-euro area basis. Progress towards more integrated infrastructure may also take time.

4.44 Surveys of market players generally indicate that EMU investors are now focusing on EMU-wide allocation strategies. For example, Tsatsaronis in BIS (2001) reports that 75 per cent of European equity fund managers believe that sector portfolio allocation strategies dominate country strategies, while only 10 per cent believe country strategies dominate. In 1997, the respective preferences were 20 per cent and 50 per cent – so there has been a significant shift since EMU.

4.45 Analysis by the ECB (2001) also finds a shift in preference away from domestic markets towards pan-European sector-based allocation. The results of their survey are shown in Table 4.2. Domestic allocation remains high but has decreased since the introduction of the euro, while funds held in pan-European or euro area funds have increased from 12 per cent to 25 per cent of the total. BNP Paribas figures, in Table 4.3, which look at both equity and bond allocation, confirm the ECB’s findings of a shift away from domestic holdings.

Table 4.2: Assets of euro area equity funds by area of investment

Year	Per cent				
	Domestic	Euro area only	Non-euro area Europe	Global	Total
1998	43	–	12	45	100
1999	33	8	14	45	100
2001	34	10	15	41	100

Source: ECB, 2001.

Table 4.3: Assets of euro area institutional investors by area of investment

Per cent	Domestic bonds	Foreign bonds	Domestic equities	Foreign equities
December 1998	73	27	62	38
December 1999	66	34	57	43
December 2000	62	38	52	48
December 2001	57	43	50	50
March 2002	55	45	49	51

Note: Institutional investors here include pension funds, mutual funds, insurance companies and banks.
Source: BNP Paribas.

The influence of economic convergence on portfolio allocation

4.46 The way in which portfolio allocation strategies develop in EMU will depend in part on the degree to which EMU promotes convergence of national euro area equity returns. The euro area's single monetary policy will lead to the convergence of risk-free nominal rates of return across national markets; it may also promote real economic convergence, which could lead to convergence of firms' expected cash flow and therefore of equity valuations. The removal of currency risk also removes another source of country-specific risk. These factors mean that euro area-wide risk factors may come to dominate equity returns, making country-specific factors less important. This may make the benefits of diversification across the euro area less strong.

4.47 Several studies have used statistical techniques to examine EMU equity market trends. The results of these studies are summarised in Annex A. These studies use two basic approaches: (1) analysing the factors which drive equity returns, and (2) analysing equity indices' correlations. If the euro area is becoming more economically integrated, then individual equity returns will be driven less by country-specific factors and more by euro area-wide and/or sector-wide factors.

4.48 The studies generally point to increased convergence of equity markets across different euro area countries. This may lower the benefits of diversification on a country basis in EMU. However, the studies also generally suggest that EMU-wide strategies based on sectors are superior to those based on countries and based on domestic allocations. This means that despite some economic convergence, there are still significant benefits to EMU-wide portfolio diversification.

Conclusions on EMU market risk and liquidity premium

4.49 There is evidence that EMU is promoting the development of a more integrated financial market in the euro area, though remaining regulatory and structural constraints mean there is still a long way to go. Evidence already suggests that these developments are reducing transaction costs and promoting increased portfolio diversification.

4.50 These developments can be expected to lead to a lower market risk premium. In a more integrated market investors will be able to diversify credit risk to a greater degree than was possible in the segmented euro area markets (though increased economic convergence may reduce the size of these diversification benefits). Investors will also find it easier to buy and sell

financial assets, and so liquidity risk should be lower. However, after just four years of EMU it is not possible to quantify any reduction in these risk premia that derives purely from the impact of EMU.

4.51 The increased size of the market should allow for the expansion of segments of the market, such as high-risk bonds, which were previously constrained by a narrow investor base, though this is not yet apparent. A well-developed market for high-yield bonds would increase access and potentially lower the cost of capital for firms that may not previously have been able to borrow on the bond market. Other things being equal, these developments could lower the cost of capital for firms looking to raise finance in the euro area.

4.52 Certain sectors will benefit from these changes more than others. Firms from the smaller euro area countries potentially have the most to gain from access to an integrated euro area market. Previously they may have been limited to a narrow financial market with a small investor base. SMEs from all countries may also have the most to gain. Large multinational firms generally have the resources and reputation to allow them to tap into international financial markets. SMEs are generally much more restricted to their national markets. These special considerations mean that the impact of EMU on SMEs is considered separately in Section 5.

Potential impact of EMU entry on the UK market risk premium

4.53 Evidence suggests that EMU has promoted the growth and integration of euro financial markets. This may lower the market risk premium for euro area countries. However, many UK firms would be able to access this market whether or not the UK enters EMU. Indeed, research suggests that exchange rate risk may not be as large a barrier to cross-border financial market provision as other factors, though it is likely that at the margin, the removal of exchange rate risk would increase access to the euro market for UK firms.⁹

4.54 One pointer to the size of market risk premia is the spread on commercial bonds over government bond yields of similar maturities. The spread reflects the risk which the market attaches to the corporate bond. This will reflect overall market risk and the risk attached to the particular firm. Comparing the spreads on national indices of many different companies can provide some evidence on national market risk. However, as discussed in Section 2, UK government bond yields may not be a good proxy for the credit risk-free rate, so the study also looks at the spread over swap rates.

4.55 Chart 4.2 shows the five to seven-year spread over their respective benchmark government bond yields of UK and euro area AA-rated issuers. UK issuers' nominal debt costs over the period are higher than those for euro area ones, though this gap began to decline from the end of 2000. Charts 4.3 and 4.4 show similar patterns, with the UK A-rated and BBB-rated bond spreads higher than the EMU spreads, with narrowing beginning around the end of 2000.¹⁰

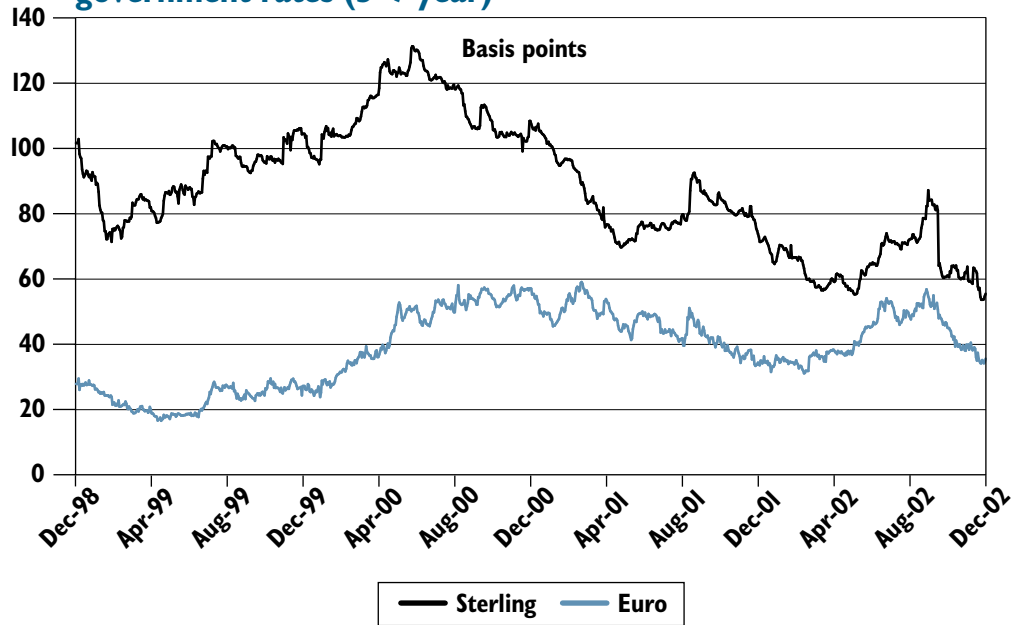
4.56 It is possible that one reason why UK AA-rated institutions have higher spreads than their euro area counterparts is lower market risk in the euro area. However, it is difficult to isolate this effect, if it is present, from other factors affecting corporate spreads, such as the general economic outlook in each country, which will determine future profitability and the risk of bankruptcy. In addition, UK credit spreads may also have been wider because of the relative scarcity of government bonds in the UK and the demand for gilts from pension funds discussed in Section 3. This makes it difficult to draw any firm conclusions on the basis of these spread indices.

⁹ For example, see Brealey *et al.* (1999).

¹⁰ Spreads of corporate bond yields over government bond yields may also be affected by the cyclicity of spreads, with spreads tending to fall as bond yields fall and vice versa.

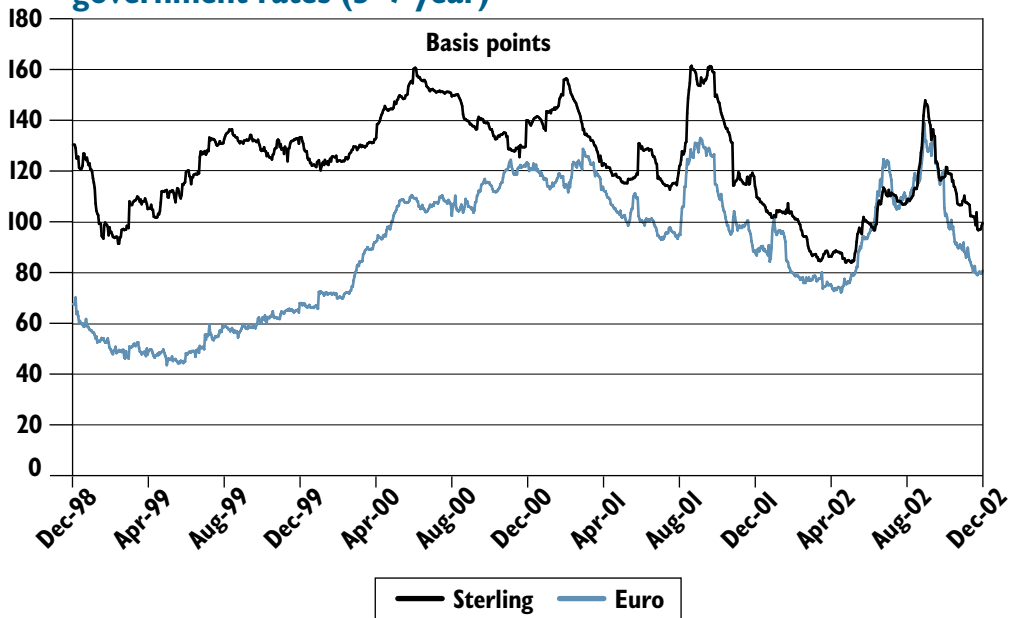
Comparing UK and euro area aggregate corporate bond spreads using government rates

Chart 4.2: Spreads of UK and euro area AA-rated bonds over government rates (5–7 year)

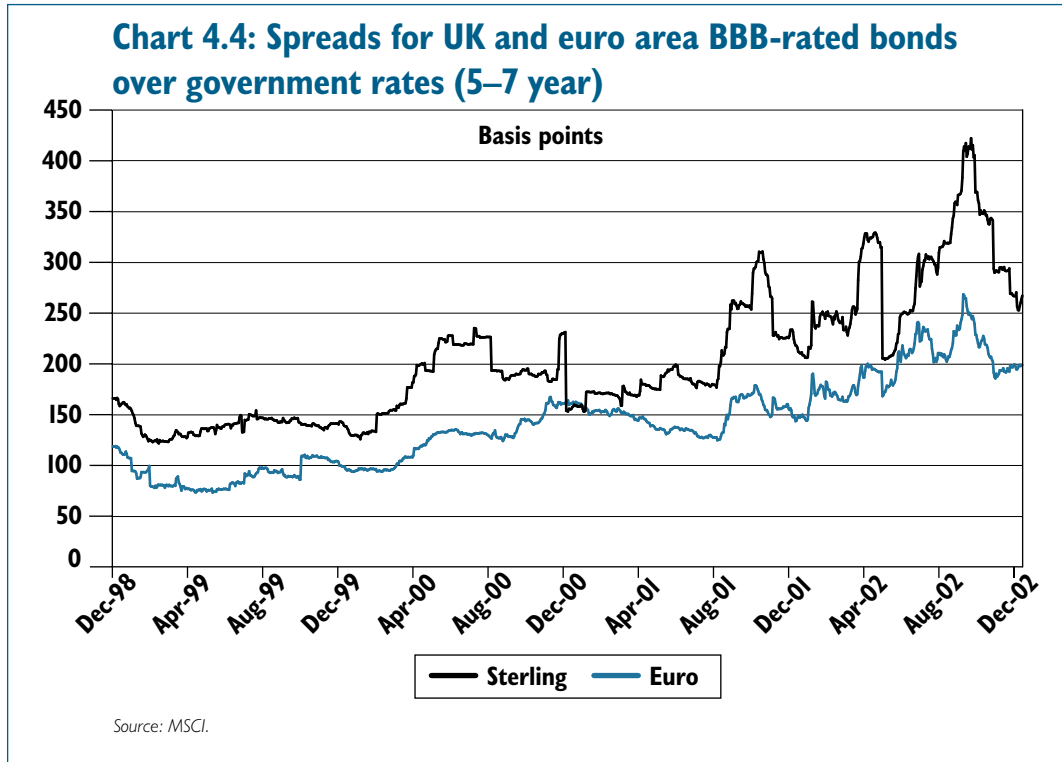


Source: Morgan Stanley Capital International (MSCI).

Chart 4.3: Spreads of UK and euro area A-rated bonds over government rates (5–7 year)



Source: MSCI.



Comparing UK and euro area aggregate corporate bond spreads using swap rates

4.57 As discussed in Section 3, it is possible to remove the distortion associated with the specific influences on the UK government bond market by instead examining the corporate spread over swap rates. Chart 4.5 indicates that AA-rated sterling corporate bonds trade at a higher spread over the swap rate than euro area corporates. This is in line with the findings of Charts 4.2 to 4.4 above, which looked at the spread over government bonds. However, for A and BBB-rated corporate bonds, there is no clear cost advantage for euro issuance. The average maturities of sterling bonds are higher than those of the euro bonds in Charts 4.5 to 4.7. As noted previously, longer maturity bonds would be expected to have a term premium, leading to larger spreads.

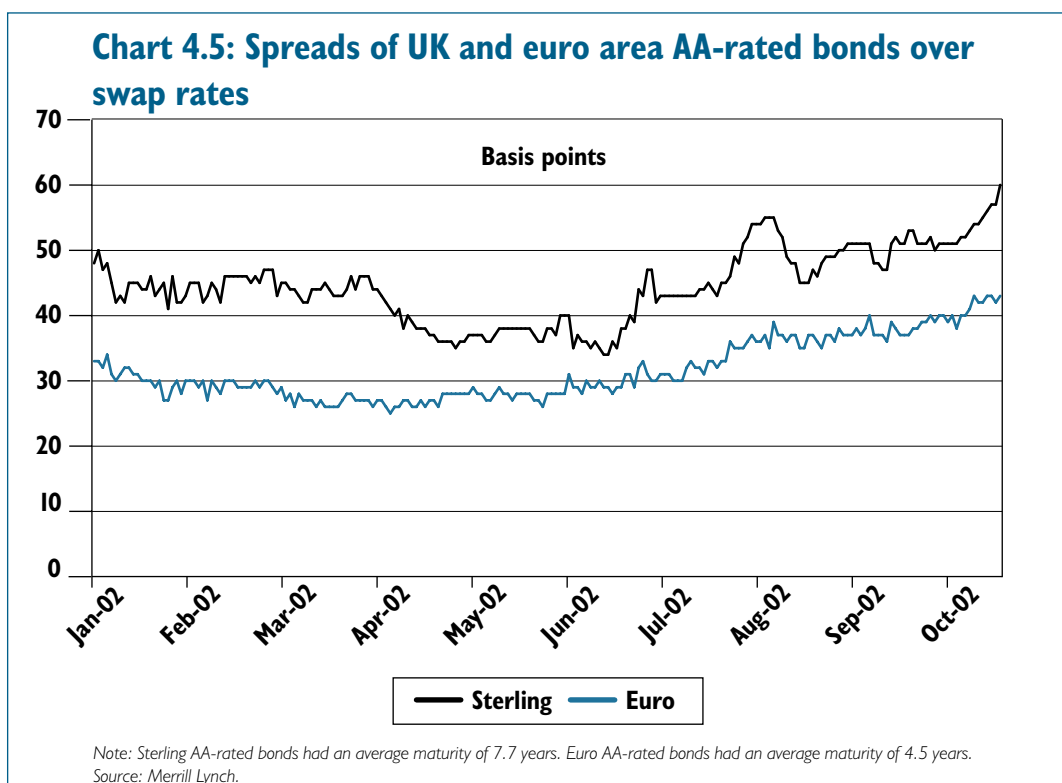
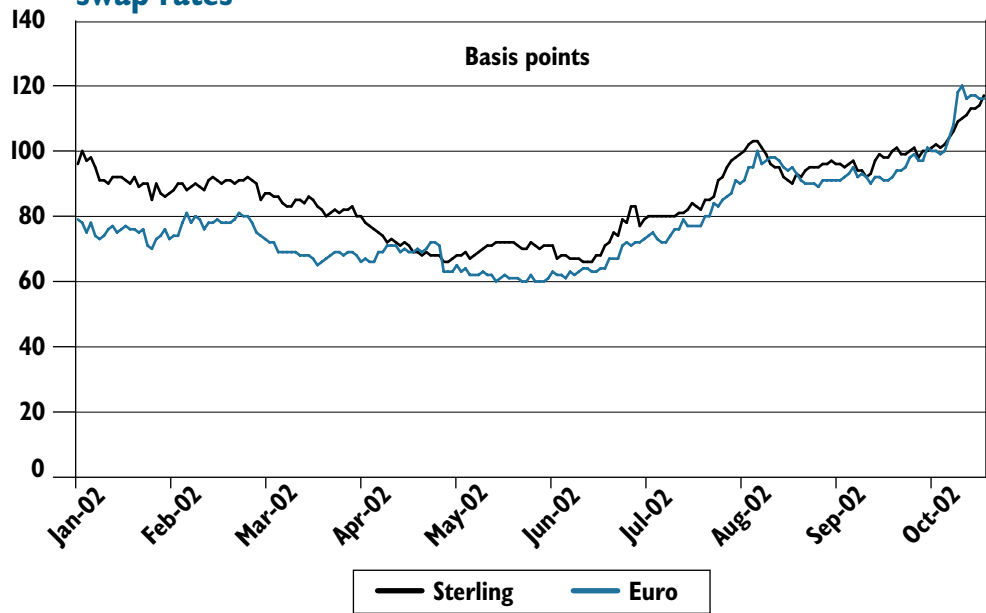
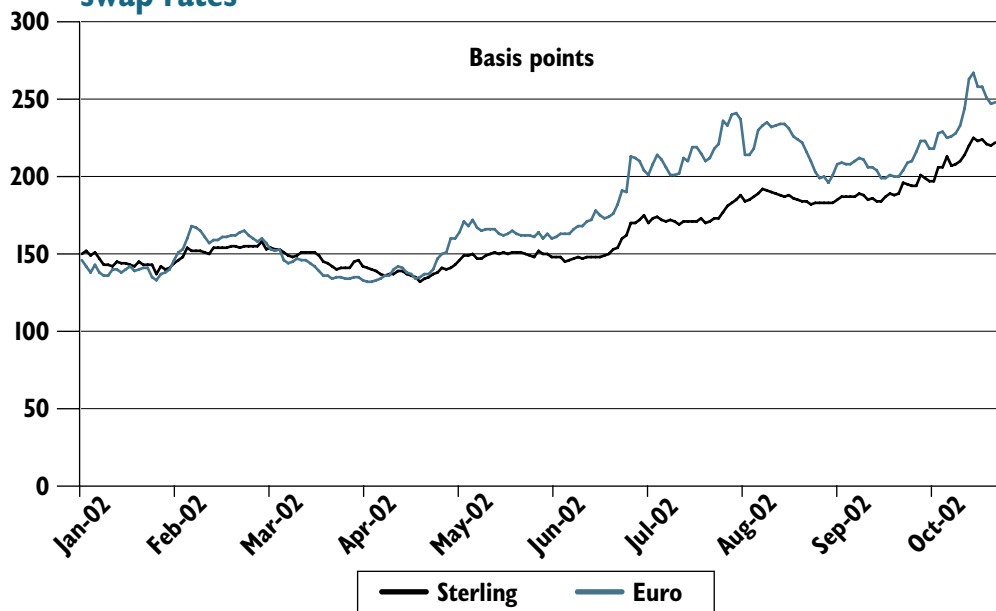


Chart 4.6: Spreads of UK and euro area A-rated bonds over swap rates



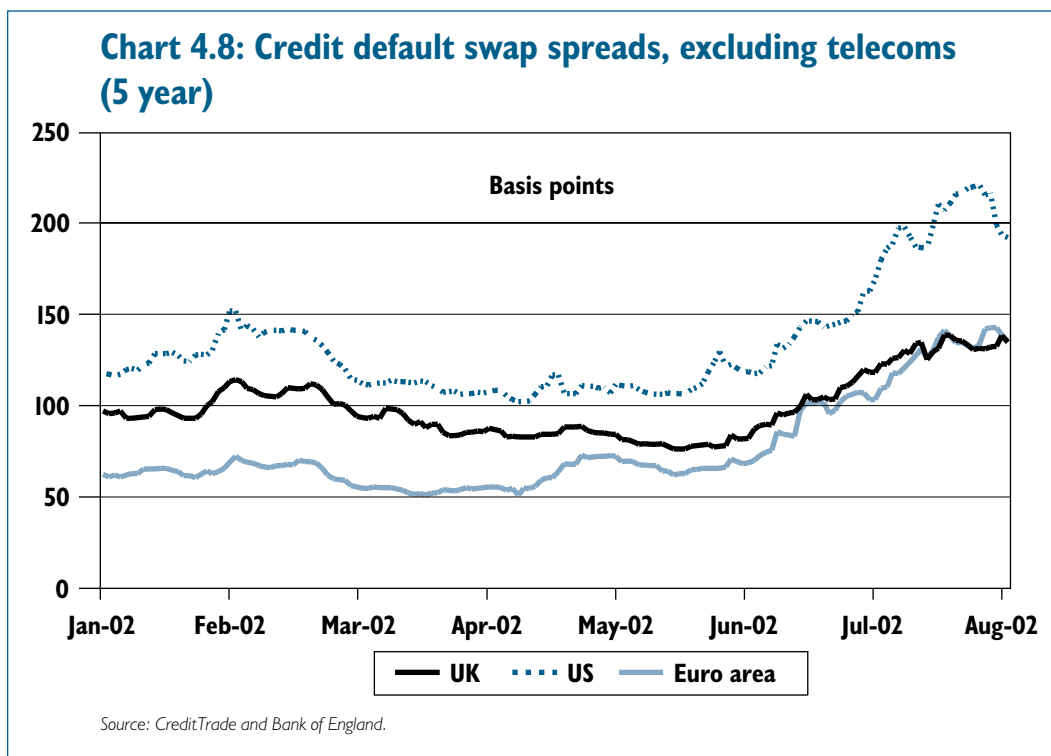
Note: Sterling A-rated bonds had an average maturity of 8.1 years. Euro A-rated bonds had an average maturity of 4.4 years.
Source: Merrill Lynch.

Chart 4.7: Spreads of UK and euro area BBB-rated bonds over swap rates



Note: Sterling BBB-rated bonds had an average maturity of 6.6 years. Euro -rated bonds had an average maturity of 3.5 years.
Source: Merrill Lynch.

Credit default swap indices **4.58** Another potential measure of the credit risk premium attached to euro area bonds can be seen in Chart 4.8, showing the credit default swap (CDS) indices. In theory, CDS should equal the difference between the yield and the credit risk-free rate on the underlying bond. The CDS price can be regarded as the cost of insurance against default occurring on the underlying bond, although there is no need to hold that bond in order to trade in credit default swaps. Chart 4.8 indicates that credit risk is lower in the euro area than in the UK and the US. However, these indices do not compare the same ratings and sectors of issuers, so must be regarded with caution. Telecoms CDS have been excluded from these series, as telecoms are more heavily weighted in the euro index and have significantly higher spreads than other corporate CDS.



Analysing the risk premium for specific firms **4.59** A problem with comparing aggregate indices is that differences may reflect the different proportions of different sectors and types of issuers within them. It was for this reason that telecoms were excluded from the aggregate in Chart 4.8. An alternative is to compare directly the euro and sterling spreads over swap rates for specific companies that issue in both currencies.

4.60 The charts in Annex B present spreads over swaps for five large UK firms: British Telecom, Gallaher, Pearson, HBOS and Lloyds TSB. This comparison suggests little consistent difference between sterling and euro risk premiums. Some firms face a lower spread over swap rates (an alternative measure of the risk-free rate) when raising capital in euro, while others have a lower spread in sterling. So, although the aggregate picture shows no clear cost advantage to UK firms of issuing bonds in euro, it may be cheaper for individual firms to issue euro-denominated debt. EMU entry would allow these firms to avoid the cost of swapping their debt into sterling, although this is likely to be a small cost for a large issuer, with the transaction cost of a conventional swap ranging from approximately two basis points up to five basis points, depending on maturity and size.

UK and euro area equity risk premia **4.61** Another method for comparing the cost of capital in the UK and euro area markets is to look at the equity risk premium in both areas. However, estimating the equity risk premium is notoriously difficult. There are four ways of looking at this, as outlined in Ibbotson and Chen (2001):

- using an historical time series of the difference between equity market returns and government bond yields and extrapolating forward;
- using earnings, dividends and overall productivity measures to derive the expected equity risk premium;
- surveying finance professionals; and
- deriving equities' expected returns through the payoff demanded by investors for bearing the risk of equity investments, which relies on the CAPM model outlined in Section 2.

4.62 Comparative estimates have been produced using the first method, i.e. by looking at historical evidence on the difference between equity market returns and government bond yields. Dimson *et al.* (2002) look at returns from 1900 to 2001 and estimate a lower equity risk premium in the UK (5.5 per cent) than in France (6.7 per cent), Germany (9.6 per cent), the US (6.7 per cent) and the euro area (7.5 per cent).¹¹ However, there are problems with this approach. Actual equity returns may be lower than this method suggests because it ignores the impact of firms which go bankrupt on returns. In addition, there is no reason why the past should be any guide to current or future risk.

4.63 A recent survey of investment managers by Merrill Lynch¹² looks at expectations of future equity risk premia, and finds that the UK equity risk premium is around 3.5 per cent, compared to 4 per cent for the euro area and 4 per cent for the US. Credit Suisse First Boston (2000) estimate equity risk premia based on expected returns of 4.4 per cent for the UK and 3.7 per cent for the US over the period 1995 to 2000.¹³ This suggests that membership of a large, integrated financial market could bring a reduction in the risk premium. However, Dimson *et al.* (2002) also look at expected risk premia, and find that UK rates are lower (at 6.2 per cent) than Germany (10 per cent), France (9.5 per cent) and the US (7.5 per cent).

Conclusion on the impact of EMU entry on the UK market risk and liquidity premium

4.64 Evidence suggests that the euro capital market has become more integrated since the start of EMU, though there is still much to be done before the market is fully integrated. However, after only a few years of EMU it is difficult to isolate an EMU effect on market risk premia, either from looking at corporate bond spreads or equity risk premiums.

4.65 Moreover, many UK firms are able to access the euro market at relatively low cost. However, for smaller companies transactions and hedging costs are likely to be a significant hurdle to raising capital in the euro area, or indeed in any overseas market. Hedging costs will be higher as a proportion of funds raised when financing needs are lower, as much of the cost involved in acquiring the financial expertise needed to undertake such operations is fixed. This means that for SMEs UK entry to EMU could remove a quite significant barrier to accessing the euro markets, potentially reducing the cost of capital for these companies. However, there would remain significant informational barriers and transactions costs to smaller companies raising funds in EMU. These issues are discussed in more detail in the next section.

¹¹ The euro area estimate is a GDP weighted, seven-country average (Germany, France, Italy, Netherlands, Spain, Belgium and Ireland) derived from Dimson *et al.* (2002). The GDP data are for 2001, European Commission, DG Economic and Financial Affairs (2001).

¹² Merrill Lynch (2002). Weighted average taken of fund managers views on appropriate equity risk premium for individual areas.

¹³ Credit Suisse First Boston (2001) estimate an equity risk premium of 4.3 per cent for the UK and 4.1 per cent for the euro area over the period 1995 to 2001. Comparable estimates for the US over this period are not available.

