Quantification of the Macro-Economic Impact of Integration of EU Financial Markets

Final Report

to

The European Commission - Directorate-General for the Internal Market

By

London Economics

in association with

PricewaterhouseCoopers and Oxford Economic Forecasting

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Introduction

London Economics, in association with PricewaterhouseCoopers and Oxford Economic Forecasting are pleased to present to the European Commission the Final Report of the study "Quantification of the Macro-Economic Impact of Integration of EU Financial Markets". This report deals with:

- The impact of full integration and the ongoing changes in the structure of the European financial markets on market liquidity and depth;
- The impact of the above on the costs of finance in terms of both equity and bond capital and the efficiency of the markets across the European Union;
- The results from our survey of European financial market participants on the potential gains from full integration of financial markets; and
- The results of our macroeconomic simulations of reductions in the cost of capital arising from further financial market integration in the European Union.

Overview of the Effects of Financial Integration

European financial integration is leading to profound changes in the structure and operation of the financial services sector throughout the continent.

Through a more open and effective European financial market a number of benefits are expected for both investors and the corporate sector. Investors will benefit from higher risk-adjusted returns on savings, through enhanced opportunities for portfolio diversification and more liquid and competitive capital markets. The corporate sector will benefit from generally easier access to financing capital. Competition in the financial intermediation sector will offer corporations a wider range of financial products at attractive prices.

The economy-wide improved allocation of financial resources to investment projects should impact positively on the equilibrium level of GDP and potentially also on GDP growth.

We have been tasked by the European Commission DG Internal Market to rigorously and independently assess and quantify the macroeconomic benefits in terms of higher standards of living that would flow from full integration of European financial markets.

More specifically, we have been asked to examine the extent to which the merging of the presently still regionally-fragmented liquidity into a single liquidity pool would reduce the cost of equity and bond finance for businesses in Europe, help stimulate investment and expand productive capacity.

This report presents the detailed results of our empirical work on the impact of European financial market integration on the cost of equity and bond finance.

We also present the results of a survey of key financial market participants' views on the likely impact of financial market integration on various costs of equity trading, the cost of equity finance, bond yields and other potential benefits.

Finally, we present the results of macroeconomic simulations that quantify the likely macroeconomic impact of the estimated changes in the cost of equity and bond finance.

European financial integration has much progressed in recent years, especially following the adoption of the single currency and the gradual implementation of the Financial Services Action Plan. Financial intermediaries are increasingly adopting a pan-European perspective and some financial markets, such as money markets, have become largely integrated and pan-European in nature.

Yet, there remain many barriers that prevent the emergence of a single financial market. In this study, we focus on the impact of the elimination of all remaining obstacles to full integration, assuming that the appropriate policy responses and measures will be implemented.

European Financial Integration and Equity Markets

In relation to equity markets, our analysis focuses on the likely impact of full European financial market integration on secondary market equity implicit trading costs and on the costs of equity capital.

Building on the recent literature examining the link between a stock's trading costs, the characteristics of the stock and the size of the stock exchange on which it is traded, we have developed and estimated a two-equation model of implicit trading costs and turnover using information on trading costs and stock characteristics of almost all the stocks (11,131 in total) traded over the period of January 1999 to December 2001 on the stock exchanges of the major OECD economies.

Our empirical work suggests that trading costs could fall sharply as a result of full European financial market integration.

We have also developed and estimated a model linking a firm's cost of equity capital to the trading costs of the firm's equity on secondary markets. Our results show a strong, positive relationship between trading costs and the cost of equity capital.

We then use our models to estimate for each EU Member State the impact that the reduction in trading costs arising from full European financial market integration would have on its cost of equity capital

We find that the cost of equity capital would fall across Europe by about 40 basis points on average. This estimate is very similar to the reduction in the cost of capital expected by the vast majority of financial market participants responding to our survey.

In our macro-economic simulations of the impact of European financial market integration, we also allow for a further reduction of 10 basis points arising from reduced clearance and settlement costs, implying a total reduction in the cost of capital of, on average, 50 basis points across Member States. We summarise these impacts in the table below.

Summary of Estimated Gains from Integration of European Stock Markets – Components of Reduction in the Cost of Equity Capital

Country	Est. Reduction in Cost of Equity Capital due to Decreased Illiquidity Costs - Basis Points	Total Est. Reduction in Cost of Equity Capital – Basis Points
Austria	50.1	60.1
Belgium	49.0	59.0
Denmark	46.7	56.7
Finland	46.2	56.2
France	48.9	58.9
Germany	46.4	56.4
Greece	21.8	31.8
Ireland	48.6	58.6
Italy	36.9	46.9
Luxembourg	49.0	59.0
Netherlands	40.6	50.6
Portugal	48.7	58.7
Spain	13.4	23.4
Sweden	44.6	54.6
UK	26.2	36.2
Weighted average	**36.7**	**46.7**

Source: London Economics estimates

European Financial Integration and Corporate Bond Markets

We have also examined how European financial market integration may lower the cost of market debt for non-financial corporations. As the secondary corporate bond market is still highly illiquid and not very transparent, we have examined the impact of European financial market integration on the four key determinants of the cost of bond funding, namely the risk-free rate, the credit risk spread, the cost of issuing corporate bonds and corporate bond trading costs in secondary markets.

We believe that the most pronounced impact on financial market integration will be felt in the primary market. Financial market integration will result in a deeper and more liquid market, and should lead to further reductions in the credit spread (or risk spread relative to a comparable risk-free security) required by investors.

We have found that the recent growth in the stock of Euro-denominated corporate bond issues by European non-financial corporations has resulted in a decrease in the credit spread as investors in Europe and elsewhere in the world have become more familiar with European non-financial corporate debt.

In our macro-economic simulations of the impact of financial market integration, we assume that this "learning effect" continues and will reduce the costs of market debt by about 40 basis points for all non-financial European corporations alike. The underlying assumption is that, within total corporate debt financing, the share of bond financing will increase while the share of bank financing will fall so that the current gap between the share of bond financing in total debt financing between the U.S. and the European Union is reduced by a quarter.

European Financial Integration – Survey of Financial Market Participants

We also present the findings from PwC/London Economics' survey of European financial market participants, which surveyed the views of a range of market players in relation to the likely magnitude of financial integration impacts. It is useful to summarise the main findings from the survey, as follows:

- 73% of participants surveyed were of the view that integration of financial markets would result in lower brokerage commissions and other direct/explicit transactions costs. 59% stated that they expected bid-ask spreads would decrease following integration, and 45% that they would expect price impact of transactions to decrease.

- The expected magnitudes of these impacts were 11% in terms of lower

brokerage fees and other direct trading costs, and 8% in terms of lower bid-ask spread and lower price impact of trades.

- 47% of interviewees across the six countries were of the view that equity yields would decrease as a result of full integration of markets. Of these, 70% were of the view that equity yields could decrease by up to 50 basis points and 10% by between 51-100 basis points. This implies that of all respondents 33% expect the decrease to be between 0 and 50 basis points and 6% above 50 basis points.

- 46% of market participants were of the view that bond financing costs would fall following full integration of markets. Of these, 71% expected that bond yields could fall by up to 50 basis points, and 14% by between 51-100 basis points. This implies that, of all respondents 33% expect the decrease to be between 0 and 50 basis points and 6% above 50 basis points.

- Enhanced opportunities for diversification/portfolio choice, increased liquidity of markets and increased competition among exchanges and financial intermediaries were perceived as important benefits of financial market integration.

European Financial Market Integration – Macro-economic Simulation Scenarios

Our simulations of the macro-economic impact of integration of European financial markets have been carried out using our multi-country macro-economic model. The key simulation results to note are that, as a result of the combined reduction in the cost of equity, bond and bank finance, together with the increase in the share of bond finance in total debt finance:

- The level of EU-wide real GDP is raised by 1.1%, or €130 billion in 2002 prices, in the long-run;

- GDP per capita in current prices is €600 higher in the EU and GDP per capita at 2002 prices is €350 higher;

- Total business investment is almost 6.0% higher and private consumption is up by 0.8%;

- Total employment is 0.5% higher.

A decomposition of the contribution of the various changes in the user cost of capital shows that:

- The reduction in the cost of equity finance is the most important impact, accounting for 0.5 percentage points (or 45%) of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices;

- The impact of the reduction of 40 basis points in the cost of bond finance alone is marginal, explaining a further 0.1 percentage point of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices;

- The combination of the reduction in the cost of bond finance together with the increase in the share of bond finance in total debt finance, however, results in a more substantial boost to output. Together these two changes account for 0.3 percentage point of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices;

- Finally, the assumed reduction in the cost of bank finance of 20 basis points also explains 0.3 percentage point of the 1.1 percentage point increase in EU-wide real GDP.

The combined impact of the four changes in the user cost of capital (i.e., the reductions in the cost of equity, bond and bank finance and increase in the share of bond finance in total debt finance) varies somewhat across countries. Across the EU, the estimated increase in the level of real GDP stemming from integration of financial markets ranges from 0.3% to 2.0%. However, the majority of Member States show an increase in the range of 0.9% to 1.2%.

The important point to note of these simulation results is that, while the impact of the reductions in the user cost of capital varies somewhat across countries, it is economically significant in all.

It is also important to remember that the results presented here abstract from any dynamic effects that could permanently raise output and productivity growth. Thus, these can be said to be relatively conservative estimates of the likely impact of reductions in the user cost of capital brought about by deeper European financial market integration.

Impact of recent developments in capital markets

Finally, we have also tested the sensitivity of our estimates with respect to recent developments in financial markets. If we compute the reduction in the cost of the equity capital on the basis of the stock market capitalisations on September 30, 2002, we obtain an average figure of 24.1 basis points (compared to an average reduction of 36.7 basing points using the average capitalisation of stock markets in 2001). If this smaller estimated reduction in the cost of capital were to be used in the macroeconomic simulation, the overall impact of full European financial market integration on long-run EU-wide GDP would be about 0.9 percentage point. This compares to the 1.1

percentage points figure reported in the base case (using the average capitalisation in 2001).

The estimated economic effects of the reduction in the cost of bond financing depend crucially on the assumption that the euro-denominated corporate bonds issuance will be buoyant enough to close by 25% the gap between the U.S. and the EU in the share of bond financing in total debt financing.

The slowdown in euro-denominated corporate bonds issues in recent months does underline the fact that this required increase in euro-denominated corporate bond issues will require some time and that cyclical or other temporary factors may occasionally slow the general process of shifting towards greater reliance on bond financing. But will not fundamentally alter the capital market dynamics set in train by financial market integration. [1] Therefore, recent bond market developments give no grounds to change substantially our quantitative estimates of the long run impact of full European financial market integration in the corporate bonds market.

[1] In fact, a number of other likely systemic changes, such as pension reform, will most likely contribute to accelerate the trend away from bank financing in the medium term.

1 Introduction and Background

The European Commission appointed London Economics in association with PricewaterhouseCoopers and Oxford Economic Forecasting in December 2001 to undertake a study to quantify the macro-economic impact of integration of European financial markets. This document constitutes the final report of this study. The report focuses on the presentation of research and empirical estimation findings in relation to:

- The impact of full integration and the ongoing changes in the structure of the European financial markets;
- The impact of the above on the costs of finance in terms of both equity and bond capital and the efficiency of the markets across the internal market;
- The results from our survey of European financial market participants on the potential gains from full integration of financial markets; and
- The results of macro-economic simulations incorporating reductions in the cost of capital for corporations flowing from our analysis of the impact of financial market integration on the cost of equity, bond and bank financing.

1.1 Background to Study

The background can first be described in terms of the context. This points to the existence of increased competition in financial markets, which stems from the impact of completion of the EU internal market, deregulation, technological progress, and globalisation. These forces have in recent years combined to lead to greater integration of EU financial markets.

Greater integration has in turn led to profound changes in the structure and operation of the financial services sector throughout Europe. Among the more important effects of increased integration has been the development of more sophisticated financial products and increased securitisation.

The corporate sector has been making a gradual move away from traditional bank-based financing and towards an increasingly market-based approach to raising capital.

In addition, the personal sector has become much more deeply involved in equity and other security-based investment markets as a result of a greater range of investment services on offer, and the support provided through the development of information technologies.

The inception of the euro has accelerated this integration process, and the creation of deeper and more liquid financial markets throughout the euro area and the EU as a whole is regarded as being an important element in enhancing competitiveness and economic efficiency more generally.

A key policy development in this regard has been the European Commission's Financial Services Action Plan (FSAP), which was endorsed by the Cologne European Council in June 1999. The FSAP has become the cornerstone of policy moves to identify the regulatory action required to successfully create a Single Market for Financial Services.

As a key input to the goal of developing an effective EU response to implementing the FSAP priorities, the Commission wished to undertake a study that would quantify the macro-economic impact of integration of financial markets across the EU.

1.2 Terms of Reference for Study

The terms of reference for the study indicated that the overall objective of the study is to provide robust quantitative estimates of the impact of the integration of EU financial markets on economic growth, employment and other macro-variables.

The terms of reference set out a number of more detailed objectives for the study, as follows:

- To assess how financial market efficiency impacts on the economic growth process;
- To assess whether and how integration of previously national financial markets into a eurozone-wide market enhances their efficiency and thus boosts growth;
- To model the economy-wide effects (including second-order macro effects) of deeper and more liquid financial markets, resulting from integration; and
- To concentrate the analysis on the impact of the structural aspects of integration of financial markets and their efficiency.

The main requirement of the study is to quantify the potential benefits of integrated financial markets in terms of economic growth, employment and other key macro variables when compared with a counterfactual of continued fragmentation of financial markets.

It was also agreed that the study would focus on the following key issues:

- The impact of full integration of European financial markets on the

implicit costs of trading in equities and bonds, in particular focusing on the issues of market liquidity and depth;

- The impact of the above on the costs of raising equity and bond capital;
- The macro-economic impact of reductions in the costs of equity and bond capital.

1.3 Other Potential Integration Benefits

In addition to the impact of reduced trading costs, there are also likely to be a number of other potentially significant factors driving down capital costs, which fall outside the scope of the terms of reference for this study. However, it nevertheless useful to identify the most important of these effects and present our judgements as to how such effects could be formally quantified and modelled.

Portfolio diversification effects will have a significant impact on the cost of capital. A greater availability of financial instruments will increase the asset span or, in a sense, the types of risks that can be diversified away through portfolio management. This implies lower portfolio risk and thus lower rates of return required by investors to hold these portfolios. This, in turn, should directly translate into a lower cost of capital.

Liquidity and market depth effects are the other side of the coin. As noted for example by Merton (1987), liquidity will have an important impact on the cost of capital. The broadening of the investor base for a given stock leads to a lower cost of equity, through greater risk pooling. The required rate of return on a given risky asset depends crucially on the covariance between the payoff to that asset and the payoff to the "market portfolio", i.e. its systematic risk. As a given market becomes more open, the degree of foreign ownership rises. The required rates of return fall in the local market, because external investors require a lower rate of return to compensate for bearing risk that is at least partially diversifiable.

The value for firms and for the economy as a whole of access to high risk capital is likely to be very significant. High risk capital is an important engine of growth as it finances innovative investment in either new sectors or new technologies. The return on this type of investment is highly volatile and this may not be an attractive risk to hold unless it is spread across many agents with each holding a very small fraction. The development of financial markets makes this risk spreading possible to attain at reasonably low cost. To assess the value of this availability of funds it is useful to consider comparable data from the US where venture capital is about five times the European amount. The value of that capital after a few years of market listing of the respective companies provides an indication of the value forgone when such investments were not feasible due to poorer availability of funds.

1.4 Structure of the Report

This report is structured as follows: in Section 2 we present an overview of the impacts of integration of financial markets, both generally and in the European context; in Section 3 we examine the potential impact of European financial market integration on equity trading costs and the cost of equity capital in Europe; in Section 4 we review the impact of financial integration on European corporate bond markets and cost of bond financing; in Section 5 we report the results of our survey of market practitioners' views on the impact of European financial market integration on the cost equity and bond financing; in Section 6 we present the results of our macroeconomic simulations incorporating reductions in the cost of capital for corporations flowing from our earlier analysis of the impact of financial market integration on the cost equity and bond financing; and finally in Section 7 we present our overall conclusions.

In Annex 1, we present the questionnaire used in our survey of financial market participants while in Annex 2 we present the detailed survey results. The detailed results of the macro-economic simulations are then presented in Annex 3. Finally, in Annex 4, we briefly address the issue of the impact of changes in the user cost of capital on productivity and output growth.

2 Overview of the Impact of Financial Integration

We first provide an overview of the impacts and benefits of integration of financial markets. We begin by introducing the background to the study of financial integration and the potential benefits accruing from the creation of an integrated financial market. We then set out our approach to defining integration and its associated transmission mechanisms within the context of this study.

2.1 Background to Financial Integration in Europe

Broadly speaking, financial integration can be defined as making formerly regionally separate financial markets work as a single integrated market. Financial integration in Europe has much progressed in recent years, especially following the adoption of the single currency and the gradual implementation of the Financial Services Action Plan, leading to a remarkable transformation of European capital markets. A corporate euro bond market has emerged whose issuing activity in 1999 has even exceeded that of the dollar market. Primary issues in European equity have reached new highs, with new markets becoming prominent internationally. Europe-wide indices have emerged. Portfolios begin to be allocated on the basis of pan-European sectoral strategies and some financial markets, such money markets, have become largely integrated and pan-European in nature. Banks all over Europe have merged or formed alliances on an unprecedented scale, while cross-border mergers in all industries have also increased strongly.

This process is leading to profound changes in the structure and operation of the financial services sector throughout the continent. Through a more open and effective European financial market a number of benefits is expected for both consumers and the corporate sector. Investors will benefit from higher risk-adjusted returns on savings, through enhanced opportunities for portfolio diversification and more liquid and competitive capital markets. The corporate sector will benefit from generally easier access to financing capital. Competition in the financial intermediation sector will offer corporations a wider range of financial products at attractive prices. The economy-wide improved allocation of financial resources to investment projects should impact positively on the equilibrium level of GDP and potentially also on GDP growth through higher investment in human capital, physical capital, and R&D.

While some benefits are already accruing to market participants, such as lower transaction costs due to the single currency, a lower interest rate environment and a wider choice for financial services, there are still many

barriers that prevent the emergence of a fully integrated financial market[2]. This suggests that there could be more benefits to be gained from the creation of a single financial market. Before starting the assessment of what these gains are likely to be, we will take a closer look at the possible benefits from financial integration.

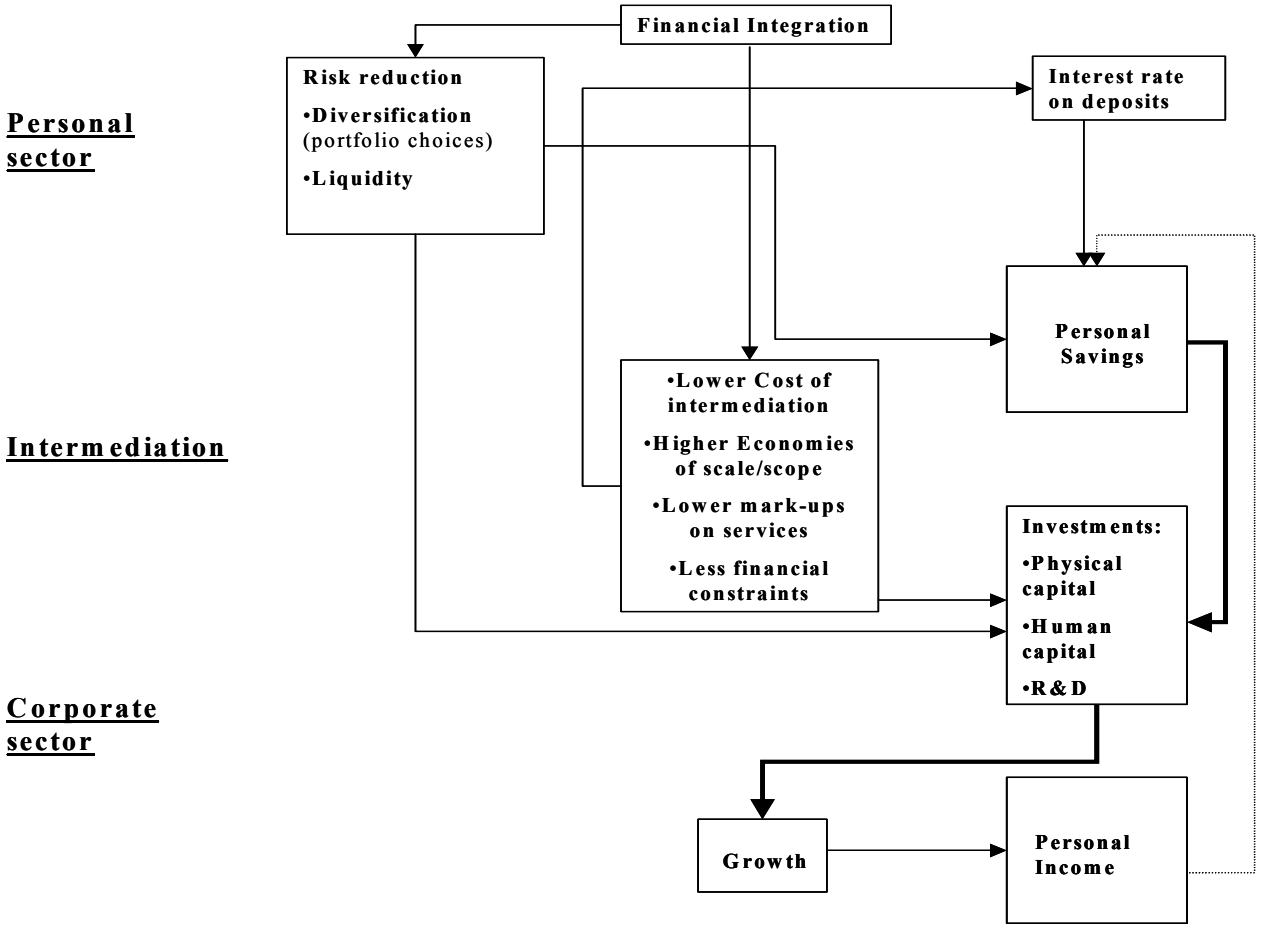
The next sub-section provides an overview of the benefits from financial market integration for the functioning of financial markets as well as different market participants, e.g. consumers and firms.

2.2 Benefits of Financial Integration

The process of European financial integration will have significant impacts on the functioning of financial markets. In this section we begin by presenting a detailed analysis of the predicted effects of financial integration on the functioning of financial markets. We then identify how further improvements in the efficiency of financial markets are likely to translate into a number of benefits for market participants. A schematic representation of the main economic transmission mechanisms involved in financial integration is provided overleaf in Figure 2.1.

[2] For a more detailed discussion of the current state of financial market integration and the remaining barriers to full integration see for example Adam et al. (2002), Calcagnini (2002), EC, Economic and Financial Committee (2002), European Central Bank (2001a, 2001b, 2001c), Galati and Tsatsaronis (2001), Kleimeier (2002), Quiros and Mendizabal (2001) Santillan et al. (2000), von Thadden (2001).

Figure 2.1: The Transmission Mechanism of Financial Integration



Integration and the functioning of financial markets

We define financial market integration as constituting a very large, single European financial market where all intermediaries, private investors and firms meet to carry out their financial transactions. This does not preclude the possibility that trades take place in different physical locations, rather it implies that these locations will be so deeply integrated that all cross location transactions will take place seamlessly. Compared to the current world of still partially fragmented markets we identify a number of major expected impacts.

1. **Increased competition among exchanges/market places.** More competitive exchanges and alternative market places will imply lower listing and transaction costs. Competitive pressures will also increase the incentives for technological innovation in trading procedures, in turn leading to faster and less costly transactions.

2. **Increased competition among financial intermediaries.** This should result in lower brokerage and transaction fees, and greater incentives for innovation and increased variety in financial products.

3. **Lower costs due to economies of scale.** Both exchanges and other intermediaries are likely to have lower costs per unit of transaction, which provides an additional avenue through which trading related charges should be lowered.

4. **Banks and other more traditional sources of corporate finance face tougher competition from financial markets.** Given the widening of the markets, firms in every European country are likely to have wider and easier access to financing. Under these competitive pressures, it is likely that banks will lower their loan rates and loan related fees.

5. **Improved price transparency.** Prices of financial assets may more closely reflect underlying value since they pool information from a larger number of sources. Firms' actions are thus more closely scrutinised since there will be larger demand for information about firms' performance.

6. **Increased market depth and lower liquidity risk.** When investors throughout Europe can trade assets from firms in any European country on equal terms, this corresponds to a much larger demand side facing each firm's issuing of debt or stock. This will result in a deepening of the market and, to the extent that deeper markets give rise to higher trading volumes, integration reduces liquidity risk.

7. **Larger markets for high risk capital such as venture capital.** Currently,

the level of venture capital in Europe is only about one fifth of that in the US. The development of a larger financial market allows for better possibilities of risk diversification, which should result in lower required rates of return for high risk capital.

Financial integration benefits for consumers

There are likely to be a range of benefits for consumers deriving from greater financial market integration. These benefits include:

1. **Lower transaction costs.** Greater competition among exchanges and intermediaries should result in lower average trading costs. This will allow investors to rebalance their portfolios more effectively and will increase rates of return net of transaction costs.

2. **Higher expected risk-adjusted rates of return.** Due to wider possibilities for risk diversification, equilibrium portfolios will have lower risk for the same expected rate of return.

3. **Larger availability of financial products.** Financial innovation stemming from competition among intermediaries may create more highly tailored and attractive financial products, thus increasing investors' welfare.

4. **Prices transmit more information.** When financial markets are larger, more open and better developed, the price mechanism is expected to work more efficiently. Increased price transparency benefits all market participants and through a reduction on the perceived risk of asset holdings further increases the risk-adjusted rate of return of a given portfolio.

5. **Indirect benefits through improved economy-wide performance.** Indirectly, we would expect that the improved functioning of the European financial markets should result in higher GDP growth rates, increased employment, and improved incentives to innovation and the creation of wealth.

Financial integration benefits for firms

A number of developments related to the integration of financial markets are likely to have a significant impact on firms' costs of raising capital through both equity and bond markets. These include:

1. **Lower trading costs.** Investment banks and other intermediation related fees are likely to be reduced due to more aggressive competition among intermediaries. The resulting reduction in market spreads will directly make asset holdings more attractive to investors and further, through an

increase in trading volumes, also contribute to increase liquidity in the market.

2. **Lower required rates of return.** If each stock's individual risk can be more easily diversified away by investors, the rate of return that investors will require to hold it is lower, which corresponds to the firm receiving a higher price for its stock, i.e. a direct reduction in the cost of capital.

3. **Lower rates on bank loans.** Through the higher level of competition among alternative financing sources, bank financing may also be made available to firms at lower rates.

4. **Firms have access to a larger pool of potential investors.** Firms having access to a larger pool of investors, i.e. a deeper market, will expect to sell their stock and debt issues at higher prices, corresponding to a lower cost of capital.

5. **Lower level of uncertainty about the price at which the stock may be accepted by the market.** In countries where the use of financial markets is not widespread, investment banks can incur higher underwriting and related costs, for example, when assisting in an IPO listing. As uncertainty about firms and about markets is reduced these costs are likely to decrease.

6. **Increased access to venture capital and high risk capital in general.** The costs faced by firms seeking to raise high-risk capital are typically very high. This results from the need to compensate high risk through higher returns. However, we should expect that the deepening of financial markets increases the overall demand for higher risk capital thus helping to reduce to cost of raising such funds.

7. **Better flow of information.** When the market possesses more information about firms, this has the effect of reducing the risk premium that investors require to hold a stock or even a corporate bond, and thus reduces the cost of capital for the firm.

8. **Investor recognition effects.** Newly listed companies will face closer monitoring by financial markets, which will contribute to overall firm recognition within the market. This in turn is likely to imply lower risk premia for such firms' future stock issues.

In the next sub-section we will review some of the most recent research on the links between financial market development/integration, capital accumulation and economic growth. Not only will this provide us with a

better understanding of how financial integration stimulates growth, but will also present some empirical tests on the significance of this process.

2.3 Linkages Between Financial Markets and Economic Growth: a Survey of the Literature

The existing literature on financial integration and economic growth distinguishes between two lines of work. One strand has tried to include financial development into the macro-mechanism of growth, whereas the other is focused on empirical testing of economic relations between growth and its sources (Levine, 1997).

There are a number of key issues that are relevant to understanding the linkages between financial markets development and economic growth. Financial development has a dual effect on economic growth. On the one hand, the development of domestic financial markets may enhance the efficiency of capital accumulation. On the other, financial intermediation may contribute to raising the savings rate and, thus, the investment rate.

The former effect was first emphasized by Goldsmith (1969), who also found some positive correlation between financial development and the level of real per capita GNP. It is also likely that the process of growth has feedback effects on financial markets by creating incentives for further financial development.

McKinnon (1973) and Shaw (1973) extended the earlier argument by noting that financial deepening implies not only higher productivity of capital, but also a higher savings rate and, therefore, a higher volume of investment. It could also be thought that an important contribution of financial deepening to growth is through increasing the marginal productivity of capital.

There is also some evidence that there exists a positive two-way causal relationship between economic growth and financial development (see, for example, Greenwood and Jovanovic (1990)). On the one hand, the process of growth stimulates higher participation in financial markets thereby facilitating the creation and expansion of financial institutions. Financial institutions, by collecting and analysing information from many potential investors, allow investment projects to be undertaken more efficiently and, hence, stimulate investment and growth.

Account also needs to be taken of the fact that individuals face uncertainty about their future liquidity needs (see Bencivenga and Smith (1991)). Individuals can choose to invest in a liquid asset—which is safe but has low productivity—and/or an illiquid asset—which is riskier but has high productivity. In this framework, the development of financial intermediation increases economic growth by channelling savings into the activity with high productivity, while allowing individuals to reduce the risk associated with their liquidity needs.

The relationship between borrowing constraints and growth will ultimately depend on the importance of the effect of borrowing constraints on the marginal productivity of capital relative to their effect on the volume of savings. In particular, De Gregorio (1996) and others have shown that a relaxation of borrowing constraints increases the incentives for human capital accumulation. This effect is likely to increase the marginal product of capital and, hence, may lead to higher growth despite the reduction in savings.

Recent empirical studies on financial development and growth are based on regression analysis for large cross-sections of countries, following the important work of Barro (1991) that relates growth of each country with an indicator of financial development and a set of other determinants of growth.

These studies generally find a positive relationship between the level of development of financial intermediaries, stock market liquidity and the depth of financial markets, and aggregate economic growth or the determinants of growth, where these determinants include private saving rates, physical capital accumulation, and total factor productivity growth (see, for example, Beck et al. 2000, EC 2001, Khan and Senhadji 2000, Leahy et al. 2001, Levine and Zervos 1998, Levine and Loayza 1999, Thiel 2001, and Tsuru 2000).

Recent industry-level, firm-level, and event studies also suggest that the level of financial intermediary development has a large, causal impact on real per capita GDP growth (see, for example, Rajan and Zingales, 1995; Demirgüç-Kunt and Maksimovic, 1998; Jayaratne and Strahan, 1996).

Our detailed study of the direct impact of European financial market integration on equity and corporate bond markets (and its indirect impact on capital formation and GDP) complements the previous studies on the impact of the completion of the Internal Market in the EU. In 1988, the European Commission published the findings of its studies on the economics of integration.[3] At that time, the analysis of the impact of financial liberalisation and capital markets integration indicated potential Europe-wide gains amounting to approx. 1.5% of GDP over a six-year period. And, more recently, a new study suggested that potential for higher growth through European financial integration could be up to 0.5% of GDP per year, or € 43 billion (in 2000 prices) added annually to EU GDP[4].

2.4 Defining Financial Market Integration for the Purpose of Study

In very general terms, financial integration corresponds to making formerly regionally separate financial markets work as a single integrated market. Financial markets *inter alia* include equity markets, bond markets and the banking sector. The focus of the current exercise, however, will be on equity

[3] Research on the "Cost of Non-Europe" - Studies on the Economics of Integration, Commission of the European Communities, 1988.

[4] Study commissioned by the European Financial Round Table (Gyllenhammer Report, 2002)

and bond markets and we will thus abstract from the impact that financial market integration will have on the banking sector.

We would like to note that financial integration is not necessarily synonymous with "frictionless financial markets", though greater integration may lead to reduced frictions in some areas. There are frictions in financial markets that are inherent to the industry structure and these may not disappear with financial integration per se. Examples of such frictions are the presence of economies of scale due to the large fixed costs of setting up an exchange, the existence of network externalities in the industry, and the nature of the incentive problems facing financial intermediaries, whether due to asymmetric information or otherwise. These frictions will affect the functioning of financial markets even if financial integration is fully achieved.

Although European financial integration has advanced considerably in recent years, there remain still many barriers that prevent the emergence of a full single financial market. In this study, we focus on the impact of the elimination of all remaining obstacles to full integration, assuming that the appropriate policy responses and measures will be implemented.

Throughout this report we will use what we believe to be the most workable definition of financial integration. The full integration scenario will correspond to the existence of fully integrated financial market in Europe. A more comprehensive description of this market will be provided in the next section.

2.5 A Single Securities Market

A single securities market may be considered as one in which supply and demand for a given instrument/security can interact freely on a European wide basis. There should be no legal or administrative barriers which prevent the free flow of liquidity or information across the EU or distort pricing of a security in one part of the market compared to another (e.g. information disclosed to markets should be the same). An efficient market should also support frictionless reallocation of capital across different asset classes (including to small caps and venture capital).

In short, there should be a single EU pool of liquidity for each instrument. This will deliver liquid and efficient pricing of financial capital for enterprises/issuers, and maximise efficiency and competition between intermediaries and service providers. Efficiency and liquidity are ephemeral concepts. However, in the context of building an integrated EU securities market, integration and transparency can serve as operational policy targets. Efficiency and competition should operate at all levels of the trading system so as to ensure that European markets are globally competitive.

A single securities market can also be benchmarked by reference to how it serves the different actors:

- **Issuers:** should be able to sell newly created securities to investors located in other parts of the market without encountering

regulatory/administrative barriers or additional compliance costs. These opportunities should be open to all types of capital raising (including, initial public offers, SMEs and venture capital);

- **Investors:** should be able to purchase a financial asset traded on a partner country market without additional impediment/delay, risk/uncertainty or costs when compared to the same transaction executed on a local market;

- **Intermediaries:** should be able to transact freely with clients in other Member States on the same terms and conditions as business transacted in their home country, and should not be constrained for legal, administrative or fiscal purposes to establish a physical presence in the partner country. Intermediaries and service suppliers should also have non-discriminatory access, on commercial terms, to essential services or facilities required for the effective provision of investment services;

- **Infrastructure suppliers:** all providers of infrastructures (trading systems, clearing, settlement, depositaries) should be free to offer services/establish in partner countries on the basis of home country authorisation.

- **Supervisors/regulators:** should be able to rely on a seamless web of market supervision which guarantees stringent and effective real-time enforcement of commonly agreed provisions to all securities related activities and structures. Without the necessary confidence in the effectiveness and impartiality of supervision elsewhere in the system, the prospects for rational and efficient supervision (based on home country principle) will be compromised.

The above approach to defining a securities market is neutral with regard to the degree of centralisation and consolidation of market infrastructures, and the underlying market model. As these are likely to evolve under influence of current structural developments, it is important to avoid an approach that is predicated on the continued existence of particular functions or market models.

2.6 Quantification of the Benefits of Integration

The focus of our analysis will be on the quantification of the impact that financial integration will have on firms' cost of capital through the reduction in financial markets trading costs for equity financing and a reduction of credit spreads, issuance costs and trading costs for bond financing. Equity and bond financing account, on average, for approximately 50% of the total liabilities of firms across Europe. However, in our macroeconomic

simulations we will also incorporate additional assumptions on the impact of financial integration on the cost of the bank finance.

Our analysis divides into two elements. Firstly, we examine the transmission mechanisms from market integration to trading costs. This will include a review of both theoretical and empirical literature in order to construct the most appropriate econometric model linking the two variables of interest. Our proposed methodology takes account of the current state of the markets compared to a scenario of full integration.

The second element of our analysis deals with the quantification of the relationship between trading costs and the cost of capital facing firms as well as of the direct effects of financial integration on certain bond financing costs, such as credit spreads and issuance costs. This section also reviews the underlying theoretical links between these two variables and proposes alternative methodologies to quantify the expected impact of lower trading costs on the cost of capital.

The next element of our analysis focuses on developing a formal investigation of the impact of financial market integration on equity trading costs and the cost of equity capital. The key outcome of the exercise will be an estimate of the benefits in terms of a lower cost of capital that could be achieved by complete integration of European stock markets.

3 European Financial Integration and Equity Markets

In this section we present our analytical framework and a detailed analysis of the impact of integration of European financial markets on equity trading costs and the cost of equity capital. This section is comprised of five parts. First, we review the cost of market fragmentation. We then discuss and estimate the relationship between financial market integration and trading costs. Next, we study the relationship between trading costs and the cost of equity capital. We next focus on the gains that full financial market integration in Europe could yield in terms of lower trading costs and lower costs of equity capital. Finally, we present our overall conclusions.

3.1 The Cost of Market Fragmentation

Fragmentation of securities markets is attracting considerable attention. This, in part, derives from the rapid growth in transactions recorded outside a fully centralized market, e.g. through alternative trading mechanisms such as Over The Counter (OTC), Alternative Trading Systems (ATS) or internalisation. While parties to such transactions find it beneficial to use alternative trading routes, regulators and policy-makers worry that fragmentation may reduce financial market transparency and hence the overall efficiency of financial markets. This phenomenon of fragmentation, however, relates only to the splitting up across multiple market centres of transactions in a security that, in the past, would have been traded on a single exchange.

Regional fragmentation of capital markets, e.g., the splitting up of the total capital pool in a given area, such as the European Union, across a number of separate (or only weakly linked) trading centres has also attracted considerable attention. In general, however, the focus has tended to be at the more macro-level and little attention has been paid so far to the impact of regional fragmentation on the performance of traded securities. In contrast, the competitive environment created by increased financial market integration has attracted considerable attention as evidenced by the various restructuring, rationalisation, and merger activities of various European stock exchanges.

Until very recently, the economic literature linked the trading costs in a security exclusively to a number of attributes of that security. A number of studies, however, have started to examine whether, in addition to security-specific attributes, certain characteristics of the market (for example, market depth or liquidity) in which the security is traded have a separate and additional impact on the trading costs of the security.

Regional fragmentation will matter for a generic security to the extent that market-wide factors influence security-specific liquidity. The theoretical underpinnings of such a link are not yet fully developed but a few recent

studies have found a clear empirical link between the overall market liquidity and the security-specific liquidity or trading costs.[5] Overall, these studies show that smaller or emerging markets have significantly higher trading costs and that such costs tend to be increased by market volatility, and significantly reduced by trading activity, and market size.

This section aims to expand further on the existing knowledge concerning the impact of regional fragmentation on market conditions by examining more broadly the link between trading costs and market depth and liquidity. We will also examine and quantify the potential implications of EU capital market fragmentation for the cost of equity capital of European firms.

We refer specifically to the following two components of implicit trading costs:

- **Market spreads** can be thought as the price of immediacy in security markets (Demsetz, 1968). Suppliers of immediacy, such as market makers, are passive traders who stand ready to trade at prices they quote. The demanders of immediacy are active traders who place market orders to trade immediately. Immediate sales are usually made at the bid price and immediate purchases are usually made at the ask price. The spread between the bid and ask price can be thought of as the economic cost of providing this immediacy. An alternative explanation of market spreads assumes the presence of asymmetric information. A supplier of immediacy faces the risk that a bid or ask will be accepted by someone with superior – or adverse- information. Informed traders buy at the ask price if they have information justifying a higher price, and sell at the bid if they have information justifying a lower price. When the information becomes known, informed traders gain at the expense of suppliers of immediacy. As Bagehot (1971) first noted, if suppliers of immediacy are to avoid losses, uninformed traders must pay a spread sufficient to compensate suppliers of immediacy for losses to informed investors.

[5] See Chordia, Roll and Subrayaman (2000) and Huberman and Hailka (2001). Another recent study by Hasbrouck and Seppi (2001), however, does not find such a link. Of even greater interest is a recent study by Board and Wells (2001) which compares the trades executed over SETS, the system used by the London Stock Exchange, and Tradepoint. The study finds that about 3% of the trade on SETS were done at prices that could have been bettered on Tradepoint. The authors hypothesise that lack of depth (i.e., liquidity) may explain why the trade was not executed through the cheaper market.

- **Market impact** is the extent to which prices move against a buyer or seller, for a given order size and can be thought of as the costs of liquidity in the marketplace. A buyer or seller of a security seeks liquidity in the marketplace. This liquidity has a cost, which depends on the size, timing, and difficulty of the order. For example, if a trader is anxious to buy a stock, he or she might pay more than the asking price to complete the trade, or, if the amount the trader wishes to buy is more than sellers are willing to sell, he or she might raise the price to entice more sellers. In general, the smaller the trade and the more patient the trader, the lower the market impact cost will be.

This section builds on the recent research on magnitude and trends in securities trading costs and their various components. According to Elkins/McSherry global Universe (2000), implicit costs are on average more than 50% of explicit trading costs, including fees and commission costs (brokerage, asset manager, etc.). Plexus (1998), a firm that specialises in measuring trading costs, calculates that market impact and opportunity costs still account for a substantial fraction of total trading costs. For example, Plexus data reveal that for larger stocks (over $1 billion in market capitalisation) the average market impact cost is 0.20%, or $0.09/share on a $45 stock, and for smaller stocks the average impact is 0.33%, or $0.15/share on a $45 stock. Plexus further measures the cost of delay for larger stocks at 0.53% and the cost of missed trades (opportunity cost) at 0.16%, while for smaller stocks they are 1.72% and 2.22% respectively.

3.2 Market Integration and Trading Costs

There are several approaches that can be pursued in order to measure the cost of market fragmentation. In this section we set out the analytical framework that links capital market integration to trading costs.

3.2.1 Background

Stoll (2000) relates market spreads to individual firms' trading characteristics in the following cross-section regression for the US stocks listed on NYSE and Nasdaq:

Equation 3.1: $s_i = a_0 + a_1 v_i + a_2 \sigma_i^2 + a_3 mv_i + a_4 p_i + a_5 n_i + \gamma_i$

where s_i is the stock's proportional quoted spread defined as (ask price-bid price)/transaction price, v_i is (the logarithm of) daily dollar volume of security, σ_i^2 is the return variance, mv_i is (the logarithm of) stock's market capitalisation, p_i is log stock's closing price, n_i is log number of trades per day and γ_i is the error term.

The rationale for these variables is based primarily on order processing and inventory considerations. A larger trading volume, average size and number of trades, and firm size, increase the probability of locating a counter-party, and thereby reduce inventory risk. The stock's return variance measures the risk of adverse price change of a stock added to inventory. The price variable controls for the effect of discreteness and is an additional proxy for risk because low price stocks tend to be riskier. Stoll finds that the empirical relationship in Equation 3.1 is very strong and explains over 60% of cross sectional variation in spreads in NYSE stocks (Adjusted $R^2 = 0.6688$). His results are consistent with those of Demsetz (1968), Stoll (1978), Tinic and West (1972) and Branch and Freed (1977).

Volatility and trading turnover are modelled as exogenous drivers of spreads in the majority of studies discussed above. From a policy perspective it is also of interest to uncover the determinants of these variables and examine how they interact with trading costs. For example, volatility of stock returns is itself driven by many factors, including the evolution of fundamentals, arrival of new information, regional factors, country specific factors, and the method of organising trading in the stock exchange. Madhavan (1992) predicts that prices are more volatile in order-driven systems than in quote-driven systems. Madhavan (1995) also finds that market fragmentation results in higher price volatility and that stock prices are also more volatile in markets without mandatory trade disclosure (low transparency). On a separate note, the volume of trading turnover for securities can also be affected by trading costs and other exchange design features and this could create a bias in the parameter estimates.

The single-equation approach outlined in Equation 3.1 has been recently generalised to multi-equation systems that analyse the impact of various market characteristics on liquidity and trading costs. For example, Domowitz, Glen and Madhavan (2000) use a triangular system of equations where volatility is both an exogenous driver and a function of market, regional, and country-specific factors. In turn, volatility affects trading costs. Turnover is related to the cost of trading, and may be affected by volatility as well. While economic theory suggests higher trading costs will reduce turnover, the effect of volatility is ambiguous. On the one hand, higher volatility may induce more trading because it is associated with a greater dispersion in traders' viewpoints, while on the other, risk adverse traders may reduce their trading in volatile markets.

The results obtained by Domowitz, Glen and Madhavan (2000) show that lower costs of trading, usually associated with better liquidity, substantially increase trading activity. Should costs fall in other developed markets to the extent that they declined in North America over the sample period, turnover is predicted to increase by about 33%.

Turnover is less sensitive to cost in emerging markets than in more developed economies. This is economically intuitive as trading volumes in emerging

markets may be more sensitive to political factors such as privatisation than to trading costs per se.

In relation to the trading cost regression, Domowitz et al. (2000) show that market capitalisation has an economically and statistically significant effect in reducing trading costs. Finally, the volatility regression shows that emerging markets experienced higher volatility. Larger market capitalisation in emerging markets tends to damp volatility, as might be expected, but the results for developed and emerging economies alike are statistically and economically negligible.

By using a somewhat similar approach, Jain (2001) investigates the institutional characteristics of 51 stock exchanges and analyses the impact of these and other market characteristics on closing bid-ask spreads, volatility and trading turnover. Institutional characteristics such as narrower tick sizes, designated market makers, consolidated limit order books, hybrid trading mechanisms, automated trade execution, centralized order flow, and better shareholder rights are associated with lower spreads. These features also influence volatility and trading turnover, which in turn affect spreads.

There are important methodological differences between the Jain (2001) study and those by Domowitz et al. (2000) and Perold et al. (1997). Whereas the latter two studies compute implicit trading costs by taking the difference between the transaction price and an indexed price, the Jain (2001) study uses the actual quoted and effective spreads at the close of each day. These are likely to be more accurate representations of costs especially if intra-day volatility in prices is high. Higher volatility could widen the gap between transaction prices and indexed prices even though the actual spreads at any given point may be low.

Another important difference is that the Jain study measures spreads at firm level (individual stocks) and relates them to the total market capitalisation of each exchange, providing an estimate of the impact of the size of the stock market on trading costs. The results show that total market capitalisation has an economically and statistically significant effect on trading costs.

In the next section, we will specify our empirical formulation to capture the impact of market depth on trading costs and discuss a number of estimation, data and measurement issues.

3.2.2 Empirical Formulation

This section considers the basic model and estimation, data and measurement problems.

Empirical model

Drawing on the literature reviewed above, our empirical formulation is based on a two-equation system, with one equation modelling trading costs and the other modelling trading turnover. This specification has essentially two main

advantages. On the one hand, it makes explicit the essential interactions among our variables of interest and the channels through which market depth affects trading costs. On the other hand, by treating both trading costs and trading turnover as endogenous, our approach should avoid any possible bias in parameter estimates caused by possible correlation of turnover with the residual term.

Denoting stocks by *i=1,…,N*, and time by *t=1,…,T*, our framework is based on the following two equations:

Equation 3.2:

$$tc_{it} = \alpha_0 + \lambda_1 tc_{it-1} + \lambda_2 tc_{it-2} + \lambda_3 tc_{it-3} + \alpha_1 tt_{it} + \alpha_2 tt_{it-1} + \alpha_3 tt_{it-2} + \alpha_4 \sigma_{it}^2 + \alpha_5 \sigma_{it-1}^2 + \alpha_6 \sigma_{it-2}^2 + \alpha_7 mdep_{it} + \alpha_8 tick_i + \alpha_9 LARGE + \sum_j \alpha_{10}^j d_j + \sum_k \alpha_{11}^k d_k + f_i + \eta_t + \gamma_{it}$$

Equation 3.3:

$$tt_{it} = \beta_0 + \delta_1 tt_{it-1} + \delta_2 tt_{it-2} + \delta_3 tt_{it-3} + \beta_1 tc_{it} + \beta_2 tc_{it-1} + \beta_3 tc_{it-2} + \beta_4 \sigma_{it}^2 + \beta_5 \sigma_{it-1}^2 + \beta_6 \sigma_{it-2}^2 + \beta_7 mdep_{it} + \sum_j \beta_8^j d_j + \sum_k \beta_9^k d_k + \mu_i + \phi_t + \psi_{it}$$

where tc_{it} is the trading cost, tt_{it} is (the logarithm of) trading turnover, σ_{it}^2 is the volatility of returns from shares, $mdep_{it}$ is (the logarithm of) total stock market capitalisation - a proxy for the liquidity and depth of the market, $tick_i$ is the relative tick size expressed as a percentage of the midpoint of that security[6], LARGE is a dummy variable proxying for the size of the issuer company, d_j denotes a full set of sector dummies, d_k denotes a full set of country/exchange dummies, f_i (μ_i) are share-specific fixed effects, η_t (ϕ_t) are time effects and $\alpha, \beta, \lambda, \delta$ denote vectors of parameters of interest.

The full sets of sectoral and country dummies identified above cover all unobserved sectoral and country-specific factors, and institutional characteristics influencing the level of trading costs (turnover) across sectors and markets. Examples of country-specific institutional characteristics include the presence of market makers, limit order books, market fragmentation[7], transparency of order flow, automatic execution of trades, developed markets, ownership of exchange by mutual cooperative of brokers, the existence and effectiveness of shareholder protection laws and rights as in La Porta et al. (1996) and Bhattacharya and Daouk (2002), etc.

[6] The midpoint of a security is defined as (Bid price + Ask price)/2.

[7] In this context trading is said to be centralised if all domestic trades in any stock in the country are executed at a single venue or passes through a single execution system. On the other hand, if the same stock can be traded on multiple trading venues within the country, the market is classified as a fragmented market.

The f_i (μ_i) terms cover all unobserved security-specific factors influencing the level of transaction cost (turnover), while the η_t (ϕ_t) terms capture shocks common to all securities. Finally, γ_{it} (ψ_{it}) captures all other shocks to share trading costs (turnover) and it is assumed to be serially uncorrelated. Absence of serial correlation is assured by the inclusion of dynamics in the form of lagged dependent and core independent variables (autoregressive model).

Once the above system of equations has been estimated, it will be possible to compute the effects of European financial integration on trading costs and trading turnover. In particular, the proposed system will allow us to estimate 1) what the average trading cost in a fully integrated European financial market would be; and 2) what would be the gain for each country of further financial market integration.

In the next sub-section we will present our estimation strategy for the system comprising Equation 3.2 and Equation 3.3.

Estimation issues

The estimation of equations 3.2 and 3.3 presents several econometric challenges, including dealing with unobserved heterogeneity in the trading costs and turnover variables, endogeneity of some of the right-hand-side variables and obtaining a reduced form for the trading cost equation. We deal with each of these issues below.

As long as the fixed effects in Equation 3.2 and Equation 3.3 are uncorrelated with the included variables, consistent estimates of the parameters of interest can still be identified. This is unlikely to be the case however. As the seminal literature on panel data estimation has clarified (see, for example, Hoch 1962, Mundlack 1961, Nerlove 1965) omitting controls for unobserved factors such as, for example, the systematic risk of the stock or for other variables that are difficult to measure or obtain will lead to biased and inconsistent estimates.

There are various approaches in the literature used to deal with unobserved heterogeneity[8]. A simple way to eliminate the stock fixed effect is to apply first differences equations 2.2 and 2.3, to obtain:

Equation 3.4:

$$\Delta tc_{it} = \lambda_1 \Delta tc_{it-1} + \lambda_2 \Delta tc_{it-2} + \lambda_3 \Delta tc_{it-3} + \alpha_1 \Delta tt_{it} + \alpha_2 \Delta tt_{it-1} + \alpha_3 \Delta tt_{it-2} + \alpha_4 \Delta \sigma^2_{it} + \alpha_5 \Delta \sigma^2_{it-1}$$
$$+ \alpha_6 \Delta \sigma^2_{it-2} + \alpha_7 \Delta mdep_{it} + \Delta \eta_t + \Delta \gamma_{it}$$

[8] A very common solution to deal with unobserved heterogeneity is to use the Within Group (WG) estimator. However, this estimator performs well only when all the regressors are strictly exogenous, or when the time element of the panel is long enough, and both these conditions are not met by our sample. For a discussion of the properties of the WG estimator, see Nickell (1981).

Equation 3.5:

$$\Delta tt_{it} = \delta_1 \Delta tt_{it-1} + \delta_2 \Delta tt_{it-2} + \delta_3 \Delta tt_{it-3} + \beta_1 \Delta tc_{it} + \beta_2 \Delta tc_{it-1} + \beta_3 \Delta tc_{it-2} + \beta_4 \Delta \sigma_{it}^2 + \beta_5 \Delta \sigma_{it-1}^2 + \beta_6 \Delta \sigma_{it-2}^2 + \beta_7 \Delta mdep_{it} + \Delta \phi_t + \Delta \psi_{it}$$

Note that differencing eliminates all the variables that are time-invariant and that tc_{it-1} is correlated with the equations error. The technique to estimate such dynamic panel data model is due, among others, to Arellano and Bond (1991). This method essentially uses further lags of the level or the difference of the dependent variable to 'instrument' the lagged dependent variables included in the model after the elimination of the fixed effects through first differencing. The validity of this technique depends on the absence of serial correlation in the error term, which can be investigated using serial correlation tests developed by Arellano and Bond (1991).

Once the implications of unobserved heterogeneity in the dependent variables are dealt with, the above system of equations still violates one of the assumptions of least squares estimation. Specifically, the disturbances of the trading cost equation are correlated with one of the regressors (trading turnover), thus creating a problem of endogeneity.

For example, a technology shock to the trading system may induce a decrease in trading cost and a possible rise in turnover. Therefore, in order to avoid possible biases in the parameter estimates, two stages least square (2SLS) estimation is instead used. In particular, when the equation is over-identified, 2SLS provides the most efficient combination of instruments. Again, providing that the error term is serially uncorrelated, all lags beyond t-2 are valid instruments and can be incorporated in the Arellano Bond methodology.

Finally, once consistent estimates of the parameters of interest have been obtained, the reduced form for the trading cost equation can be obtained by 1) imposing long-run equilibrium conditions (steady state) on both the equations, 2) calculating long-run coefficients for both the equations and 3) substituting the long-run trading turnover equation for the trading turnover variable in the long-run trading cost equation. This yields a trading cost equation that can then be used to estimate the average trading cost in a fully integrated market.

In the next paragraphs we will describe our data sources, discuss some measurement issues with respect to our variables of interest and present some simple descriptive statistics.

Data definitions and measurement issues

Data sources

The data used for our analysis is sourced from Bloomberg Professional 2002, a service that provides information on bid, ask, transaction price, market capitalisation and trading volume on a country and sectoral basis. Data on

relative tick sizes are from Jain (2001) while historical information on exchange rates has been obtained on the Internet at www.Oanda.com. More general information on the operation and the characteristics of various stock exchanges has been obtained by The Compaq Handbook of World Stock, Derivative & Commodity Exchanges 2001.

The regression sample consists of the population of ordinary shares that are actively traded on the major OECD stock markets (21 stock exchanges in 20 countries) and for which data on the bid-ask spreads are available over the period 2000-2001. In terms of market capitalisation, the stock exchanges in our sample represent over 90% of the world stock market capitalisation.

The frequency of our data is monthly. The observations on trading costs were constructed from raw daily data on closing bid, ask and transaction price that are available from Bloomberg, as follows. First, we constructed daily measures of trading costs for all the stocks in our sample. Then, for each stock in our sample, we averaged these (daily) trading costs over a month period to obtain a single data point per month. This procedure yields a (monthly) time series of trading costs (up to 24 months) for each stock in our sample. This methodology, used, for example, also by Stoll (2000) and Jain (2001), has two main advantages. On the one hand, it provides a more accurate measurement of trading costs than simply taking one observation per month. On the other, it reduces substantially the measurement error due to random day-to-day fluctuations in market spreads. Data on market capitalisation and trading volume were obtained directly on a monthly basis. Table 3.1 displays the distribution of stocks and observations across countries, after deleting stocks with missing observations[9]. Altogether, after such a cleaning process, we are left with 187,340 observations (or data points) in our sample.

[9] The sample includes stocks of firms listed on the largest 21 stock exchanges for which at least 3 continuous observations per year were observed. Firms experiencing extreme price movements such as more than a 200% growth rate or a percentage decrease greater than 50% in any of the key variables (bid, ask, price) were dropped from the sample as the a priori hypothesis was that such wide swings most likely reflected stocks' characteristics outside the scope of the analysis or coding and reporting errors rather than true changes.

Table 3.1: Sample Size by Country/Exchange

Country/Exchange	No of Stocks	No of Observations
Australia -Sidney	1,162	13,194
Austria - Vienna	109	1,677
Belgium - Brussels	202	3,649
Canada - Toronto	1,064	20,332
Denmark - Copenhagen	222	4,022
Finland - Helsinki	166	1,954
France - Paris	794	8,624
Germany-Frankfurt	638	11,259
Greece - Athens	323	5,427
Ireland - Dublin	60	1,043
Italy - Milan	242	4,351
Japan - Tokyo	2,096	23,009
Netherlands - Amsterdam	153	2,653
New Zealand	118	2,253
Portugal - Lisbon	75	1,321
Spain - Madrid	137	2,661
Sweden - Stockholm	346	6,396
Switzerland - Zurich	252	4,790
UK - London	530	4,849
US-NASDAQ	2,924	33,974
US-NYSE	1,536	29,902
TOTAL	**13,149**	**187,340**

Source: LE elaborations on Bloomberg data

In the following paragraphs, we present the precise definition of each of our variables of interest and we review some descriptive statistics for these variables.

Data definitions and measurement

Trading costs: there are several alternative measures of trading costs, each of them with different characteristics[10]. The quoted and effective spreads are static measures observable at the moment of the trade[11]. The quoted percentage spread is defined as

$$QPS = (A - B)/P$$

[10] For a discussion of several alternative measures of trading costs see Stoll (2000) and Domowitz, Glen and Madhavan (2000).

[11] A problem with the use of the Bid-Ask spread in a continuous auction market is that it applies to relatively small trades. This problem can be overcome by measuring the hypothetical average price that can be obtained in the auction for a given order size, using data from the limit order book. In particular, this average price can be computed for the order size for which dealers post firm quotes. Upon computing the price for buy and sell orders, one obtains the average market spread, Pagano (1997).

where A denotes the ask price, B the bid price and P the effective transaction price.

Because many transactions take place inside the quoted spread, this measure may overstate trading costs. An alternative measure of the trading cost is the effective percentage spread, which can be defined as:

$$EPS = 2 * \left| P - M \right| / P$$

where M is the quote mid-point, i.e. (A+B)/2. This measure potentially captures the fact that large trades, that exceed the volume of securities the market is willing to trade at the quoted bid and ask prices, may move prices in the direction of the trade, i.e. the market impact effect. Therefore, the effective percentage spread is our preferred measure of trading costs because it incorporates both the impacts of market spreads and market impact on trading costs, even if it does not allow us to disentangle the two effects.

Stock volatility: the volatility of returns is computed for each stock as the standard deviation of the stock's return over a period of a month;

Trading turnover: for each stock, trading turnover is defined as the ratio between dollar trading volume and dollar market capitalisation;

Market capitalisation: this variable is computed as the sum of market capitalisation of all firms listed on that exchange;

Relative tick size: this variable is computed as the ratio between the absolute tick size applicable to price range and the (closing) trade price;

LARGE: is a dummy variable taking value 1 if the company shows an average capitalisation above the median value of the exchange where it is traded and 0 otherwise;

Fixed characteristics (i.e., the fixed effects) of the security/exchange, institutional variables and/or macroeconomic shocks: will be modelled by including dummies for each exchange/country and time dummies.

Descriptive statistics

Table 3.2 reports some descriptive statistics for our variables of interest in 2001, including the mean values of trading costs, stock volatility, trading turnover and market capitalisation for all the countries/stock exchanges included in the sample[12].

[12] Due to the "exceptional" performance of stock markets in 2000, in Table 3.2 we report descriptive statistics only for 2001.

Table 3.2: Descriptive Statistics, 2001

Country	Effective spread (as percentage of price)	Quoted Spread (as percentage of price)	Stock volatility (as percentage of price)	Trading turnover	Total market capitalisation (Trillions, €)
Australia	9.464%	9.976%	4.682%	3.117	0.463
Austria	7.947%	7.614%	2.223%	1.157	0.025
Belgium	6.938%	5.493%	3.004%	0.992	0.158
Canada	6.662%	7.154%	4.739%	2.962	0.659
Denmark	5.420%	5.613%	2.275%	2.178	0.118
Finland	5.203%	6.223%	3.135%	2.320	0.218
France	6.826%	5.931%	2.993%	1.685	1.342
Germany-Frankfurt	5.269%	5.203%	3.164%	2.460	1.201
Greece	1.628%	1.614%	3.109%	5.483	0.091
Ireland	6.597%	6.895%	3.336%	1.968	0.074
Italy	2.831%	1.514%	2.045%	2.884	0.588
Japan	2.839%	3.027%	2.737%	2.954	2.943
Netherlands	3.446%	3.631%	2.896%	4.549	0.468
New Zealand	5.610%	5.687%	2.882%	1.882	0.018
Portugal	6.719%	6.198%	2.346%	1.983	0.063
Spain	1.317%	1.315%	1.924%	4.260	0.402
Sweden	4.556%	5.117%	4.063%	3.842	0.444
Switzerland	3.902%	4.218%	2.623%	1.671	0.185
UK	1.856%	7.976%	3.191%	7.269	2.209
US-NASDAQ	2.268%	2.438%	4.623%	13.641	2.907
US-NYSE	1.153%	6.107%	2.699%	9.175	11.210
Mean	**3.995%**	**4.893%**	**3.580%**	**6.256**	**2.847**
Std. Dev.	**7.465%**	**7.788%**	**2.778%**	**14.337**	**3.338**
Median	**1.730%**	**2.332%**	**2.835%**	**2.407**	**2.133**

Source: London Economics calculations.

The above table provides very useful information on the size and distribution of trading costs as well as the relationship between these costs and other characteristics of the markets. Trading costs, as measured by the effective percentage spread are, on average, slightly less than 4% of market price and exhibit considerable variation across exchanges and countries. An indication of this variation is provided by the standard deviation of the distribution, about 7.5% or close to two times the average.

The New York Stock Exchange (NYSE) is the hub where trading costs are the lowest: the two-way effective spread is approximately 1.2% of market price, while the quoted spread is around 6.2% of market price. NYSE is also the exchange with the highest market capitalisation and the second highest trading turnover (NASDAQ is the exchange with the highest turnover). Australia is the market with the highest trading costs, with an effective spread and quoted spread of 9.5% and 9.9% respectively. Compared to markets with similar characteristics in terms of total capitalisation, turnover and stock volatility, Australia seems to show exceptionally high trading costs. With the exception of Spain and Greece, the London Stock Exchange (LSE) is the market with the second lowest trading cost, though it is smaller in terms of capitalisation than NASDAQ and Tokyo[13]. In relation to the majority of the other smaller markets, Spain and Greece seem to enjoy very low trading costs[14]. Canada-Toronto, Australia, NASDAQ and Sweden are among the most volatile markets.

The observed heterogeneity in trading costs across exchanges and countries is certainly not surprising, because it depends also on a number of institutional characteristics affecting trading and liquidity which vary from market to market. Examples of such diversity include: the presence of market makers, limit order books, market fragmentation, transparency of order flow, automatic execution of trades, developed markets, ownership of exchange by mutual cooperative of brokers, existence of shareholder protection laws and rights, etc.

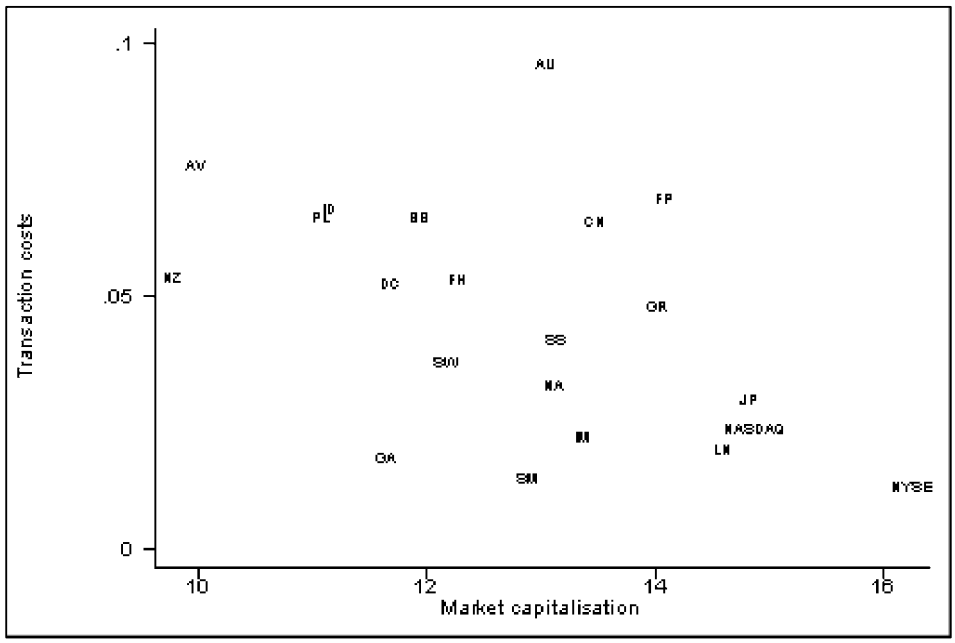
Table 3.2 reveals also that on average the effective spread is less than the quoted spread, thus confirming that a substantial amount of trading takes place inside the quoted spread. This clearly indicates that measuring trading costs by means of quoted spreads would overestimate the effective costs of trading.

Finally, a cursory look at Table 3.2 also reveals that, in general, higher trading costs tend to be found in markets that are small and where stocks are traded less frequently on average. An illustration of these simple two-way relationships is also reflected below in Figure 3.1 and Figure 3.2.

[13] The London Stock Exchange also differs from NASDAQ and Tokyo in other important respects, in particular the fact that companies listed on NADQAQ are mostly rapidly growing companies, technology companies and the Japanese market has been in a declining phase for the last ten years.

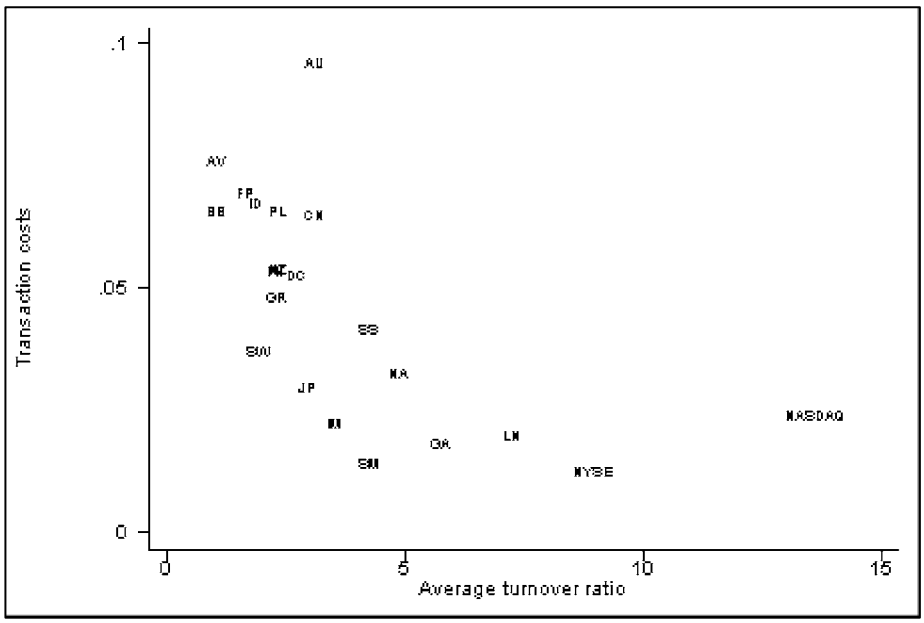
[14] No precise explanation of this has been found in the literature. The estimates reported in Table 3.2 for Spain are consistent with those reported in other studies. For example, Jain (2001) reports estimates of effective percentage spreads in 2000 (the same measure we adopt) for the top 25 stocks with highest capitalisation on 51 major stock exchanges. The EU average is 1.05%, while France is the European market with the lowest effective spread (0.49%) followed by Spain (50%). Conversely, Ireland is the market with the highest one (2.39%), followed by Denmark (1.71%). Greece shows an average effective spread of 1.47%.

Figure 3.1: Trading Costs and Market Capitalisation



NOTE: AU denotes Australia; AV denotes Austria-Vienna; BB denotes Belgium-Brussels; CN denotes Canada-Toronto; DC denotes Denmark-Copenhagen; FH denotes Finland-Helsinki; FP denotes France-Paris; GR denote Germany-Frankfurt; GA denotes Greece-Athens; ID denote Ireland-Dublin; IM denotes Italy-Milan; JP denotes Japan-Tokyo; NA denotes Netherlands-Amsterdam; NZ denotes New Zealand; PL denotes Portugal-Lisbon; SM denotes Spain-Madrid; SS denotes Sweden-Stockholm; SW denotes Switzerland-Zurich; LN denotes UK-London; NASDAQ denotes US-Nasdaq; NYSE denotes US-New York Stock Exchange.

Figure 3.2: Trading Costs and Market Turnover



NOTE: AU denotes Australia; AV denotes Austria-Vienna; BB denotes Belgium-Brussels; CN denotes Canada-Toronto; DC denotes Denmark-Copenhagen; FH denotes Finland-Helsinki; FP denotes France-Paris; GR denote Germany-Frankfurt; GA denotes Greece-Athens; ID denote Ireland-Dublin; IM denotes Italy-Milan; JP denotes Japan-Tokyo; NA denotes Netherlands-Amsterdam; NZ denotes New Zealand; PL denotes Portugal-Lisbon; SM denotes Spain-Madrid; SS denotes Sweden-Stockholm; SW denotes Switzerland-Zurich; LN denotes UK-London; NASDAQ denotes US-Nasdaq; NYSE denotes US-New York Stock Exchange.

The robustness of these findings to more in-depth econometric analysis is the subject of the subsequent analysis in this section.

3.2.3 Estimation Results

In this sub-section we present the econometric estimation results of the trading costs and trading turnover equations in first differences, as set out in Equation 3.4 and Equation 3.5. We also derive the steady-state version of the model.

Model estimation

The trading cost equation has been estimated on a sample of 12,873 stocks from 21 stock exchanges, on a total number of 132,719 observations. The trading turnover equation has been estimated on a sample of 12,841 stocks from the same exchanges, on a total number of 132,430 observations. As noted before, we have used the Arellano-Bond Dynamic Panel Data Estimator

for both the equations. The main estimation results for all the countries are displayed in Table 3.3 and reviewed in greater detail in the following paragraphs.

Table 3.3: Estimates of Trading Costs and Trading Turnover Equations

Trading cost			**Trading turnover**		
Independent variable			Independent variable		
tc_{it-1}	0.1365	(5.88)	tt_{it-1}	0.218	(21.21)
tc_{it-2}	0.0051	(0.37)	tt_{it-2}	0.0308	(4.73)
tc_{it-3}	-0.0229	(-1.89)	tt_{it-3}	0.0141	(2.66)
tt_{it}	-0.0356	(-7.22)	tc_{it}	-3.554	(-7.00)
tt_{it-1}	0.0035	(3.13)	tc_{it-1}	-0.1296	(-0.61)
tt_{it-2}	-0.0003	(-0.53)	tc_{it-2}	0.0256	(0.21)
σ^2_{it}	0.7608	(13.99)	σ^2_{it}	11.576	(36.93)
σ^2_{it-1}	0.0075	(0.36)	σ^2_{it-1}	-0.2872	(-1.34)
σ^2_{it-2}	-0.002	(-0.12)	σ^2_{it-2}	0.2099	(1.16)
$mdep_{it}$	-0.004	(-3.14)	$mdep_{it}$	0.1093	(6.50)
Number of obs[15].	132,719		Number of obs.	132,430	
Number of stocks	12,873		Number of stocks	12,841	
Joint significance	1798.76		Joint significance	5221.88	
Serial correlation (p-value)	0.2362		Serial correlation (p-value)	0.6151	

NOTE: All equations include monthly dummies; t-statistics are reported in brackets; instruments for trading turnover in the trading costs equation are given by their lags (t-2, t-3, t-4); instruments for trading costs in the trading turnover equation are given by their lags (t-2, t-3, t-4), LARGE and Tick Size; the joint significance statistic is distributed as chi-squared test; serial correlation statistic is distributed as N(0,1) under the null of absence of serial correlation, see Arellano and Bond (1991).

We first discuss the regression results for the trading cost equation. All the variables included in the regression are statistically significant and show a pattern of signs that is consistent with the literature discussed earlier. More specifically, trading costs are low when the stock is frequently traded or

[15] The number of observations/stocks may be different across equations because using lagged variables as instruments may cause the deletion of certain cross sections of data and this may change from equation to equation.

traded in a deeper market, and increase with the volatility of returns. The size of the estimated coefficients is plausible as well.

We now turn to the trading turnover equation. The regression results indicate that lower trading costs substantially increase trading activity. Volatility has a positive and statistically significant effect on turnover, thus suggesting that a more volatile environment is beneficial to trading. This suggests that the trade-generating effect of higher dispersion in traders' viewpoints is stronger than the trade-reducing effect of high market volatility, i.e. risk-adverse agents leaving the market. Lastly, as expected, trading turnover tends to be higher in more highly capitalised markets.

Finally, our regressions also have sound statistical properties. We have assessed the general specification of our models by using a chi-squared test of the null hypothesis that all the coefficients except the constant and time dummies are zero, as reported in Arellano and Bond (1991)[16]. The value of the Wald $\chi^2(10)$ test statistic is 648.62 for the trading cost equation and 2997.69 for the trading turnover equation, thus soundly rejecting the null in both cases. In addition, the fact that the error term is serially uncorrelated for both the equations suggests that our dynamic specification is also appropriate. This provides a considerable degree of confidence in our estimates[17].

Steady-state analysis

In the above model, trading costs and turnover are jointly determined. Therefore, to identify the effects of market liquidity/depth on trading costs one cannot simply look at the coefficients as they appear in the estimated equations, but one has to consider the "equilibrium values" of the system. In the analysis that follows we consider only the "equilibrium" effects on trading costs by deriving the steady state version of the two-equation system and treating all the variables other than the two dependent variables as exogenous.

Solving the estimated equations reported in Table 3.3 for their long run formulation, the steady-state equations can be expressed as follows[18]:

---

[16] This statistic provides a criterion for assessing the general specification of model that is conceptually different from the most commonly used coefficient of determination R^2. The need of using a different criterion is a consequence of the fact that there is no precise counterpart to R^2 in the Instrumental Variables (IV) framework; see, for example, Greene (2001) or STATA Reference Manual (2001).

[17] We wish to emphasise that we have conducted several robustness tests of our results, including testing alternative specifications, using different sets of instruments, estimating more general and country specific models, etc. No significant differences emerged in the results.

[18] Given the simple model $y_t = ay_{t-1} + bx_t$, the long run coefficient of x is simply $\frac{b}{1-a}$.

Equation 3.6: $\Delta tc = -0.0362\Delta tt - 0.0045\Delta mdep + 0.8583\Delta\sigma^2$

Equation 3.7: $\Delta tt = -4.8225\Delta tc + 0.1483\Delta mdep + 15.7095\Delta\sigma^2$

Substituting Equation 3.7 in Equation 3.6 and expressing that equation in levels, the steady-state, reduced form, trading cost equation is given by the following expression[19]:

Equation 3.8: $tc = const - 0.0120 mdep + 0.3506\sigma^2$

Equation 3.8 still shows that trading costs are negatively related to total market size and depth and positively to the volatility of returns. However, before using Equation 3.8 to generate an estimate of the average trading cost in a fully integrated market, we still need to obtain an estimate of the unknown constant in the equation.

This issue can be resolved by calibrating the estimated reduced form steady-state model given by Equation 3.8 on the first moments of the data from the European stock exchanges included in the sample. Applying this methodology yields a value for the intercept of Equation 3.8 of 0.1893. Our preferred equation to predict the trading costs of the integrated market can then be expressed as:

Equation 3.9: $tc = 0.1893 - 0.0120 mdep_{EU} + 0.3506\sigma^2_{EU}$

However, before proceeding to the generation of an estimate for trading costs, we first present and estimate an empirical model of the cost of equity capital as a function of trading costs in the next sub-section. Together with Equation 3.9, this model will then be used to compute the expected reduction in the cost of equity capital due to a reduction of trading costs resulting from full financial market integration.

3.3 Trading Costs and the Cost of Capital

The main objective of the subsequent analysis is to estimate a cost of capital equation that will enable us to compute the expected reduction in the cost of equity capital due to a reduction of trading costs. We begin this analysis by assessing the relationship between market illiquidity (trading costs) and the cost of equity capital from both a theoretical and empirical perspective.

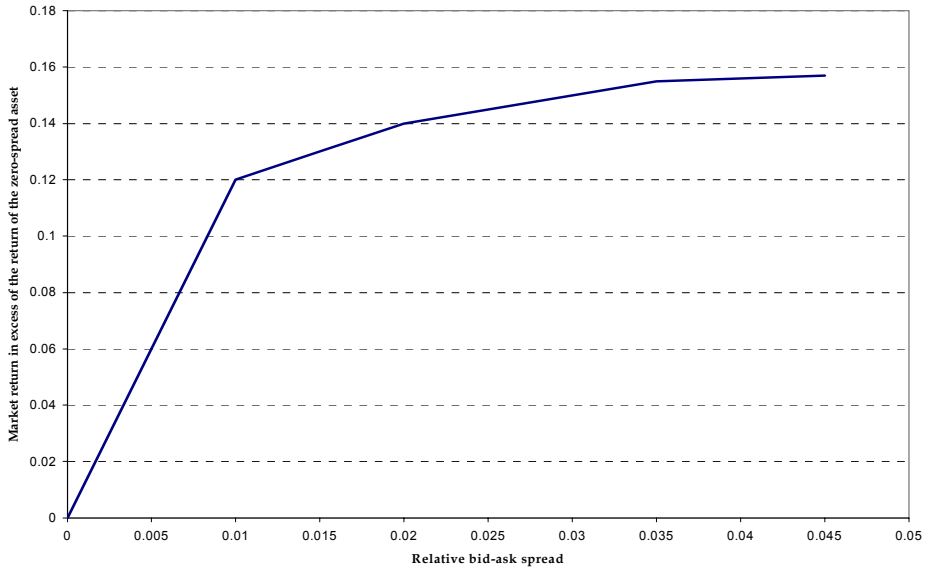
[19] Equation 3.8 is the steady state reduced form expression of the trading costs equation as trading costs are now only function of exogenous variables.

3.3.1 Why trading costs matter for the cost of capital?

One of the main conclusions of the growing body of literature on securities market microstructure is that asset returns are increasing in trading costs, see for example Amihud and Mendelson (1986), Amihud and Mendelson (1991), Aiyagary and Gertler (1991), Vayanos (1998) etc. Intuitively, in a world where trading is costly, investors require higher returns as a compensation for higher trading costs. This translates in higher financing costs for firms. The key implication of this relationship is that by lowering the opportunity cost of capital, liquidity-increasing policies may further increase capital accumulation and then employment and growth. While the direction of the causal link is straightforward, the magnitude of the impact depends on the specific framework adopted by these studies.

Amihud and Mendelson (1986) focus on the effects of the bid-ask spread, which is one the main components of trading costs, on asset returns. Their model predicts that higher bid-ask spread assets yield higher expected returns but at a decreasing rate (see Figure 3.3). This result (concavity proposition) can be explained by noticing that trading costs are amortised over the investor's holding period. The longer this period, the smaller the compensation required for a given increase in spread. Since, in equilibrium, higher-spread securities are acquired by investors with longer horizons, the added return required for a given increase in spread gets smaller. The empirical section of the Amihud and Mendelson (1986) paper not only confirms that asset returns are a concave function of the spread but, more importantly, that the impact of trading costs is also quantitatively important.

Figure 3.3: Predicted Relationship between Asset Returns and Trading Costs



Amihud and Meldeson (1986), pp.229-230.

According to Vayanos (1998), partial equilibrium models of asset pricing are likely to overstate the impact of trading costs and asset returns. When the relationship between trading costs and asset returns is explored in a general equilibrium framework, an increase in trading costs has two opposite effects on the stock's demand[20]. On the one hand, investors buy fewer shares, but on the other, they hold them for longer periods. Given that either of the two effects can dominate, the cost of capital may decrease or even increase as a result of lower transaction costs.

In equilibrium, the Vayanos model predicts the following:

- If the effects of changes in the minimum holding period due to a change in transaction cost are not taken into account, the effect on the price of a stock will probably be overestimated. This can be explained by the fact that, with higher trading costs, investors buy less equity and hold it for longer. This will reduce the risk premium, the compensation required by agents for holding a risky stock. Therefore, the fact that the marginal

[20] The model assumes a riskless, perfectly liquid bond with a constant rate of return, and many risky stocks that carry proportional trading costs. Trade occurs because there are overlapping generations of agents who buy the assets when born and slowly sell them until death.

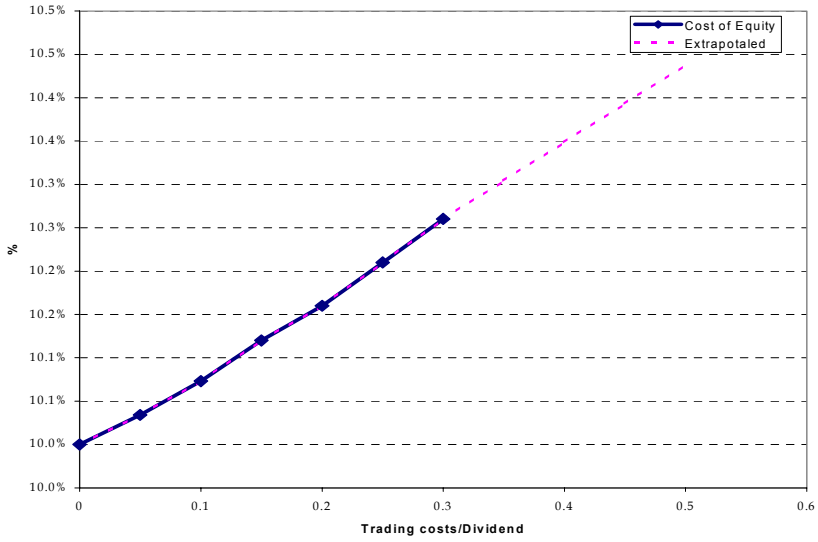
investor requires a smaller risk premium partially offsets the downward pressure on prices arising from trading costs. The difference between these two effects of trading costs is important and should not be neglected in practical applications. Ignoring this "risk premium effect" is not problematic only in two special cases: 1) when agents are risk neutral (Amihud and Mendelson 1986) and 2) when stocks are riskless (Vayanos and Vila 1998). In both cases the risk premium is zero;

- The relationship between trading costs and the cost of capital is non-linear (as in Amihud and Mendelson 1986) and depends on the stock's characteristics. For example, the prices of riskier or more liquid stocks tend to decrease as a result of the direct effect of trading cost and increase as a result of the "risk premium" effect. This makes the overall effect ambiguous. The reason for this is that the marginal investor greatly reduces his stock holdings and requires a smaller risk premium.

Figure 3.4 shows the relationship between the cost of capital and transaction cost as obtained by the Vayanos model, where the dashed line represents a simple extrapolation from an exponential trend[21].

[21] Details of the calibration are provided in the Vayanos paper, pp.25.

Figure 3.4: Cost of Equity and Trading Costs



Domowitz and Steil (2002) examine the impact of trading costs on the cost of capital directly using data from the US, 12 European and 7 Latin American stock exchanges. Their methodology focuses on the cost of capital by country and not by company. First, they construct a measure of investors' required rate of return on equities in each market, based on a very basic dividend discount model (DDM). Their measure is:

$$k_E = \frac{d_1}{p_0} + g$$

where k_E is the cost of equity, d_1 is the absolute dividend expected at the end of the current year, p_0 is the current price of each relevant index and g is the long-term expected growth rate of dividends. Trading cost data in the study is taken from Domowitz, Glen and Madhavan (1999), and turnover data are taken from published exchange data.

The Domowitz and Steil methodology involves three main steps: 1) a calculation of simple correlations between turnover, trading costs and the cost of equity; 2) an univariate regression of the cost of capital measure on trading costs and turnover separately; 3) a multivariate regression of the cost of capital measure on trading costs and turnover together.

Some results of the Domowitz and Steil study are highlighted in the table below (standard errors are in parentheses), where we show the results from

the multivariate regression of the cost of capital on trading costs and turnover for the US and European countries only. The results show that higher trading costs increase the cost of capital, while trading turnover has the opposite effect.

Table 3.4: Modelling The Cost of Capital – Domowitz and Steil

Independent variable	**Coefficient**
Log trading cost	0.167 (0.051)
Log turnover	-0.016 (0.031)
R^2	0.095

Source: Domowitz & Stein (2001)

In the next sub-section, we will present the empirical framework that we use to estimate the relationship between the cost of equity capital and trading costs alongside with our preferred estimation strategy.

3.3.2 Empirical Formulation

Model specification

Our approach updates and expands the Domowitz and Steil (2001) study by re-estimating the relationship between trading costs and the cost of equity capital at the company level.

Microeconomic data offers several important advantages for the study of this relationship. First, it allows us to eliminate the impact of aggregation over firms or plants. Second, in a given country, there may be cross-sectional variations in explanatory variables that help to identify parameters of interest. Finally, and perhaps more importantly, the availability of micro data allows us to investigate heterogeneity in behaviour between different types of firms or plants that would simply not be possible with more aggregated data.

Our model is set out in Equation 3.10 below:

Equation 3.10:

$$k_{it} = \alpha_0 + \lambda_1 k_{it-1} + \lambda_2 k_{it-2} + \alpha_1 tc_{it} + \alpha_2 v_{it} + \alpha_3 RISK_i + \alpha_4 SIZE_{it} + \sum_j \alpha_5^j d_j + \sum_k \alpha_6^k d_k + f_i + \eta_t + \nu_{it}$$

where k_{it} is the cost of equity capital for company i, at time t, tc_{it} is log trading costs, a concave function of trading cost[22], $RISK_i$ measures the riskiness of the company, $SIZE_{it}$ is an indicator of the size of the company[23], v_{it} denotes The full set of sectoral and country dummies cover all unobserved sector and country-specific factors, and institutional characteristics influencing the level of the cost of equity capital, such as the credit rating of the country and the degree of financial development. The f_i terms cover all unobserved company-specific factors influencing the level of the cost of capital, while λ_t captures shocks common to firms in all markets, such as for example a generalised financial crisis. Finally, ν_{it} captures all other shocks to the cost of capital and is assumed to be serially uncorrelated. The issue of potential serial correlation is addressed by the inclusion of dynamics in the form of lagged dependent variables and Equation 3.10 will be estimated in first-differences using the Arellano-Bond Dynamic Panel Data Estimator, along the lines discussed in the previous sub-sections.

[22] See for example the relationship plotted in Figure 3.3.

[23] This term is included to control for the so-called "small firm anomaly". For example, Banz (1981) and Reinganum (1981) found a negative relationship between risk-adjusted mean returns on stock their market value.

Using the estimation results of the impact of financial market integration on trading costs from the previous sub-sections, Equation 3.10 can then be used to generate predictions of the reduction in costs of equity capital that would occur as a result of lower trading costs. This exercise will provide us with an estimate of the impact of trading costs on the cost of equity capital at the firm level.

First, however, we describe the data sources used to estimate Equation 3.10, explain data definitions and address some measurement issues and then report the estimation results.

Data definitions and measurement issues

Data sources

The data used in our analysis were sourced from Bloomberg Professional 2002, which, in addition to the data described earlier, contains information on key components of the cost of capital. The sample consists of the population of companies whose ordinary stocks are actively traded on the major EU stock exchanges and for which dividend data are available[24].

The sample period runs from January 2000 to December 2001 and the data frequency is monthly. Table 3.5 shows the distribution of stocks and observations across countries/exchanges, after cleaning the data set and deleting missing observations.

[24] This condition has the effect of restricting our sample only to companies who regularly pay dividends, thus exluding the so-called "growth" companies. Although it is not possible to give a priori any direction of any bias this may produce, it is important to note that our sample still represents more than 90% of the original sample.

Table 3.5: Sample Size by Country/Exchange

Country/Exchange	No. of Stocks	No. of Observations
Austria - Vienna	71	1,154
Belgium – Brussels	138	2,535
Denmark - Copenhagen	156	2,869
Finland - Helsinki	123	1,432
France - Paris	534	5,947
Germany - Frankfurt	430	7,379
Greece - Athens	253	3,963
Ireland - Dublin	35	644
Italy - Milan	192	3,439
Netherlands - Amsterdam	100	1,765
Portugal - Lisbon	41	727
Spain - Madrid	92	1,789
Sweden - Stockholm	183	3,504
UK - London	248	2,477
TOTAL	**2,596**	**39,624**

Source: LE elaborations on Bloomberg data

Data definitions and measurement

Cost of equity capital: Our measure of this variable is given by the gross dividend yield, which is the first term of the cost of capital in the dividend discount model (DDM). We do not have information on the long-term expected growth rate in dividends (the second term of the DDM cost of capital), but, given that we estimate our cost of capital equation in first differences, this is not a significant problem as long as the expected long-term growth rate does not change much from month to month.

Trading cost: Trading costs are defined as the effective percentage spread, as described earlier in this section.

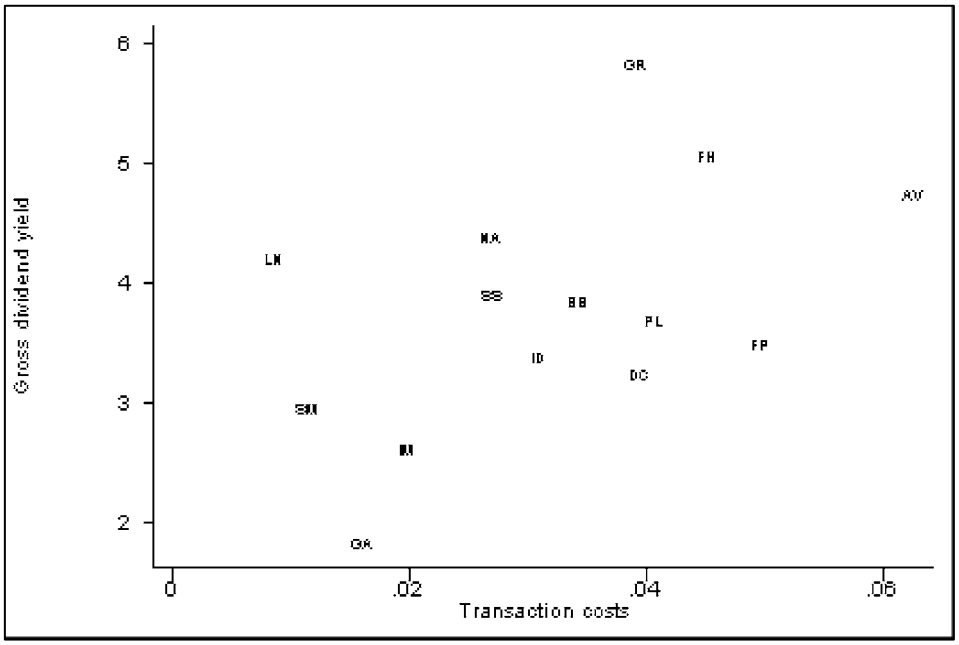
Trading volume: The trading volume is the sum of daily trading volumes over a period of one month.

SIZE: Size is measured as the total market capitalisation.

Fixed characteristics of the security/exchange, institutional variables and/or macroeconomic shocks: are modelled by means of fixed and time effects.

Before presenting the results of our econometric analysis, it is worthwhile to examine the relationship between dividend yield and trading costs as it emerges from our dataset. We have plotted in the Figure below the average level of the dividend yield for 14 EU countries against their average trading costs. In the first instance, the scatterplot seems to suggest that companies whose claims are traded in more illiquid (higher trading costs) markets have, on average, a higher cost of capital. Whether this apparent relationship is robust to econometric control and testing will be addressed in the next paragraphs.

Figure 3.5: Dividend Yields and Trading Costs



NOTE: AV denotes Austria-Vienna; BB denotes Belgium-Brussels; DC denotes Denmark-Copenhagen; FH denotes Finland-Helsinki; FP denotes France-Paris; GR denote Germany-Frankfurt; GA denotes Greece-Athens; ID denote Ireland-Dublin; IM denotes Italy-Milan; NA denotes Netherlands-Amsterdam; PL denotes Portugal-Lisbon; SM denotes Spain-Madrid; SS denotes Sweden-Stockholm; LN denotes UK-London.

3.3.3 Estimation Results

The model described earlier has been estimated on a sample of monthly data from 2,556 companies listed in 14 EU stock exchanges by using the Arellano Bond technique. The estimated equation can be expressed as follows:

Equation 3.11:

$$\Delta k_{it} = \underset{(20.73)}{0.8271}\Delta k_{it-1} + \underset{(1.06)}{0.0120}\Delta k_{it-2} + \underset{(5.75)}{0.0922}\Delta tc_{it} + \underset{(0.88)}{0.0001}\Delta v_{it} - \underset{(-5.05)}{0.0387}\Delta SIZE_{it}$$

No. of observations: 31,193[25]

Serial correlation statistic (p-value): 0.44

Joint-significance: 889.08

The regression shows good statistical properties and a pattern of signs that is consistent with both the theoretical and empirical literature surveyed earlier. Our results confirm that illiquidity costs are a key determinant of the cost of equity capital. In addition to statistical significance, the magnitude of the estimated parameter is also quantitatively important. We also find evidence of the so-called "small-firm anomaly", i.e. a negative relation between stocks' return and their market value, see for example (Amihud and Meldeson (1986), Banz (1981), or Reinganum (1981a, b). The value of the Wald $\chi^2(5)$ test statistic is 673.59, thus soundly rejecting the null that all the coefficients except the constant and time dummies are zero. Finally, the serial correlation statistics suggests that our dynamic specification is also appropriate.

We now turn to the quantification of the expected fall in the cost of equity capital due to the liquidity-enhancing effect of full integration of European stock markets. This will also include a methodological discussion on measurement issues in relation to the current degree of European stock market integration.

[25] The number of observations is smaller than that reported in the previous estimates because we have used data for the EU countries only.

3.4 Estimated Gains from Full Integration of European Stock Markets

In this section we bring together the results of the various strands of our work to obtain an estimate of the gain to each EU Member State of the lower costs of equity capital that would flow from full integration of the European stock markets.

Before proceeding, we need to define the characteristics of the integrated market and to find a suitable measure of the current degree of integration of the European stock markets. We can then estimate the change in trading cost due to full integration of European stock markets. Ignoring the depth of integration already achieved by the on-going process of reform in the EU would probably result in an overestimation of the gains achievable from the completion of a single market. The next sections present the definition of the integrated market that we adopt, discuss two different ways to deal with this matter and explain our preferred approach.

3.4.1 Definition of the integrated market

Our definition of integrated market is a very large liquidity pool where all intermediaries, private investors and firms meet to carry out their financial transactions. A measure of the "size" of the integrated market can be given in terms of the total stock market capitalisation of the EU countries.

Compared to the present situation of partially fragmented markets, the key feature of the integrated market will be that every bid or offer of equity will be confronted by a greater depth and breadth of counterparty interest. In other words, an investor who is willing to invest in a particular sector, will be able to choose indifferently not only among the national firms in the sector, but among all the European companies comprising the sector. In the last decade, integration of European financial markets has made important progress in this direction, especially with the introduction of the euro. However, in the present circumstances there are still a number of national differences in market practices, regulation, tax and legal treatments that prevent capital to freely move across countries[26].

Integration of European financial markets can play a very important role in reducing the illiquidity costs, such as bid-ask spreads, market impact costs and opportunity costs, currently faced by European companies[27]. This is

[26] A recent report by the European Commission (May 2002) highlights the obstacles that remain to EU financial market integration. It points to such factors as the continuation of "home bias" amongst equity investors, differing procedures and instruments of government bond issuance, legal obstacles that hinder cross-border securities issuance and other national differences in market pracitices, regulation, tax and legal treatments. As a result, cross-border trading costs remain substantially higher than national trades (perhaps up to 10 times higher).

[27] Recall that there are also other sources of trading costs, such as brokerage and trading fees, taxes, etc. Although market integration may activate mechanisms to reduce also these more direct or explicit

because larger-scale markets have the potential of competing away some of the risk premium that market participants would demand in the form of bid-offer spreads for buying equity positions, and reduce the market impact of any trade of a given size (compared to same trade undertaken in shallower market). This translates in lower costs of equity financing for the European companies. Another way to explain this is that if a given Portuguese company, which is currently trading in the Portuguese stock exchange, were traded in a much larger market, it should be able to finance its operations at a lower cost.

Market integration does not require increasing the supply of paper of any given stock to allow buy and sell interest in that stock to assume EU-level dimensions. This is because in an integrated market different stocks in the same trading segment (sector, size) will be close substitutes. To this extent, in an integrated market, any bid or offer of any given security is not faced with the same demand and supply as before. Market participants are now confronted with an enlarged pool of counterparties and a wider set of trading strategies and greater ability to switch between different stocks. Therefore, the critical consideration for reaping the predicted benefits of pooling liquidity is not the stock of any equity in existence but the overall depth/trading turnover in the marketplace across all stocks. This is confirmed in the empirical literature, see for example, Domowitz, Glen and Madhavan (2000) and Jain (2001), as well as our regressions earlier in the Section[28].

It is important to stress that the definition of integrated market that we adopt for the purpose of this exercise is independent of the geographical location of trading, i.e. whether trading takes place on a single Europe-wide trading platform or through many interlinked platforms, where all European companies are listed and from where it is possible to buy/sell stocks for all of them. Although there could be additional benefits from having all the trade talking place on the same trading platform, such as improved price transparency and/or faster reduction of the home-bias, the supply/demand interactions discussed above do not require the geographical concentration of liquidity.

Finally, the definition of the integrated market that we adopt further assumes that, upon completion of financial markets integration, all other differences among Member States' financial markets will disappear. We believe it is reasonable to assume this type of scenario. If financial market integration were indeed a success we would not then expect large differences in relevant financial market variables to remain. For example, we would not expect average asset prices volatility to be significantly different between a fully

trading costs, they do not form part of the present analysis.

[28] For example, according to Domowitz and al. (2000), an increase of market capitalisation of 10% will reduce total trading costs (the sum of explicit and implicit trading costs) by 0.83%. Jain (2001) reports that increase of market capitalisation of 10% will be able to reduce effective percentage spreads (the measure that we use) by 0.015%.

integrated Austrian market and a fully integrated Portuguese market. Only real side differences should remain once financial market integration is fully achieved. It could be that firms listed on the Austrian stock exchange are typically engaged in activities that are more risky than those listed on the Portuguese stock exchange. If the difference in volatility in the two exchanges is due to real side factors then these should not be considered true differences in trading costs because a given firm, with given characteristics, would have the same cost of capital in either market.

3.4.2 Measuring the change in trading costs due to full integration of stock markets

Measuring the change in trading costs due to full integration of the EU stock markets raises a number of questions from a methodological and practical perspective. While some straightforward rules such as the law of one price should hold in an integrated market, measurement problems can make these difficult to verify. For example, the law of one price states that assets generating identical risk-adjusted cash flows command the same return, regardless of the domicile of the issuer and of the asset holder. Given this definition, financial market integration can be measured by comparing the returns of assets that are issued in different countries and which generate identical cash flows. If however one fails to identify "identical" assets, or does not properly take account of their differences, one will conclude that financial markets are segmented even when they are in fact integrated. This highlights the crucial role of measurement issues for the problem at hand.

A number of studies such as Adjaoute' and Danthine (2000) and Fratszcher (2001) have used correlations of stock market returns as indicators of financial integration[29]. The underlying idea is that stock market returns should become more correlated as markets become more integrated. There are, however, both theoretical and empirical reasons that make such indicators less useful than they would appear at first glance.

On the theoretical side, as explained by Pagano et al. (2002), it is important to note that the correlation of ex-post stock market returns in EU countries has "no necessary relation with the degree of financial integration, since they may reflect also changes in the correlation structure of real and policy shocks in the individual countries. This implies that it measures the degree of financial integration only if the stochastic process of common shocks is constant over time. This is an issue of serious concern, given that Europe is undergoing a process of real integration."

On the empirical side, measures of correlation of EU stock markets' returns are quite unstable over the period 1995-2001. In Figure 3.6, we have reproduced the correlation of stock market returns in the EU 15 member

[29] For a review of the methodologies and indicators to measure the evolution of capital market integration in the European Union, see Pagano et. al. (2002)

countries as computed by Pagano et al. (2002). Each point in the graph corresponds to the average correlation of own-currency returns and exchange rate-adjusted returns[30] over the previous twelve months[31]. As we can see, the correlation starts at 40% in 1995, increases to almost 90% in 1999, and then declines to about 40% in 2001. This makes difficult to use correlation-based measures to estimate the current degree of integration[32].

Therefore, it would appear preferable to consider measures other than a correlation-based approach on both empirical and theoretical grounds. Pagano and others (2002) express the difficulties in using this indicator as follows: "Given the instability of the indicator and the questionable economic interpretation of ex-post returns correlations, the report recommends not to draw any conclusions based on such kind of indicators"[33].

Indicators of stock market integration based on returns' correlations can also be constructed at a sectoral level. For example, a recent research conducted by Commerzbank (2001) shows that sector factors have become much more important than country factors in explaining stock returns. These findings have been substantially confirmed by Rouwenhorst (1999) for the EU countries and Tsatsaronis (2001) for the euro area. These studies provide evidence that stocks are increasingly traded with a pan-European strategy, but it is not clear how to derive country-level measures of market integration from this approach[34].

[30] The correlation of returns expressed in Deutsche Marks is computed to investigate the role of the decreasing exchange rate volatility during the 1990s.

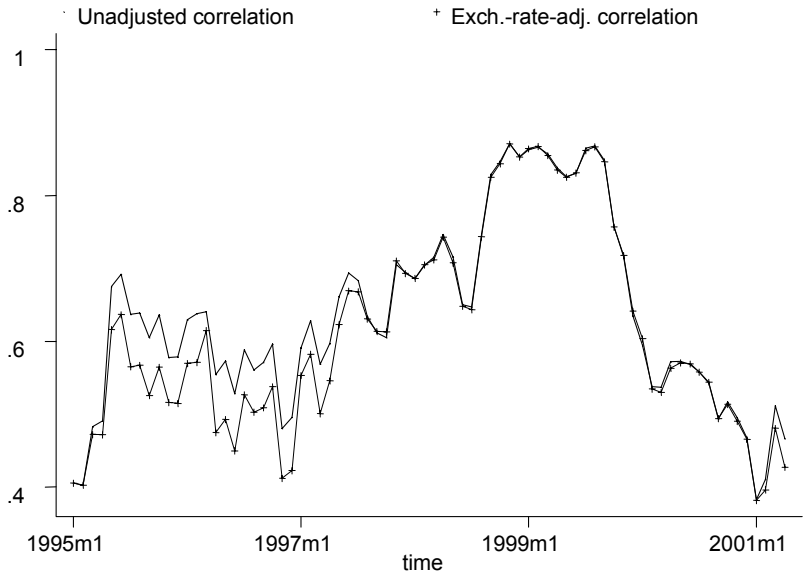
[31] Correlation coefficients of monthly returns (in Euro) of the major stock market indices with the monthly return of the German DAX are calculated for a moving 12-months time window between January 1994 and May 2001, and then averaged cross-sectionally.

[32] Weighting each country' correlation by market capitalisation reveal a very similar pattern, see Pagano et al. (2001)

[33] Pagano et al. (2001) pp.3.

[34] This point of view is supported by anecdotal evidence showing that, following the introduction of the euro, European banks have tended to eliminate country-specific trading and investment desks in favour of pan-European industry-specific desks.

Figure 3.6: Stock Market Returns Correlation, Jan. 1995 - May 2001.



Source: Pagano et al. (2002)

On the basis of these considerations, we use an alternative approach to estimate the expected reduction of trading costs due to the increase in liquidity that integrated stock markets provide. We simply use our estimated equation (Equation 3.9) to predict what would be the (average) level of trading costs in the integrated European market and then calculate the change as the difference to the current levels observed in each EU country. Recall that Equation 3.9 expresses trading costs as a function of a constant term, total market capitalisation and volatility of returns. Our interpretation of the integrated market can therefore be implemented by taking the sum of capitalisations of all the European markets, while the volatility variable can be set at the mean value of the EU sample.

The main advantage of our approach is that it takes account of the current degree of European financial integration without having to deal with the difficulties of measuring the actual degree of integration of the EU countries. This is because the actual depth and liquidity of each stock exchange is already factored in the observed trading costs. In other words, if a market enjoys particularly low trading costs because, for example, it is larger in size or more integrated than others, our approach should only capture the effects of *further* integration.

3.4.3 Expected gains for the EU countries

We can now proceed towards estimating what each EU Member State would gain in terms of lower costs of capital from full integration of the European stock markets. We do this in two stages. First, we estimate the change in trading costs for each country due to full integration. Second, we estimate the corresponding reduction in the cost of equity capital due to the lower trading costs environment.

As noted above, an estimate of the average trading cost for the fully integrated market can be obtained by using Equation 3.9 evaluated at the mean returns' volatility for the EU stocks and the total EU stock market capitalisation in 2001[35]. This produces an estimate of the average trading cost for the integrated market of 1.008% of market price. Our estimate of average trading cost in an integrated European financial market is very similar to average trading costs levels observed on NYSE (seeTable 3.2).

The subtraction of this value from current levels of trading costs in each EU country provides an estimate of each country's gain from full integration of stock markets. These reductions in the trading costs are reported in the column labelled "Predicted absolute changes in TC given a 1.008% TC level for the integrated market" of Table 3.6. As expected, smaller countries, like for example Austria, Belgium, Ireland, tend to gain relatively more than larger countries, such as example the UK. Due to the currently already low trading costs, Greece and Spain are the countries that will gain the least.

We then quantify the average change in the cost of equity capital for each EU country as a result of the lower trading costs environment. For these calculations, we use the following formula, obtained from the estimation of the cost of capital equation:

$$\Delta k_E = 0.5734 \frac{\Delta tc}{tc}$$

where $\frac{\Delta tc}{tc}$ is the percentage fall in the trading costs, displayed in the column labelled "Predicted percentage reduction of TC" Table 3.6 and 0.5734 is the long run value of the trading costs parameter in the cost of capital equation[36]. These reductions in the cost of equity capital are reported in the

[35] Implicitly we assume that all the liquidity that is presently split across a number of market places will flow through a single, integrated market.

[36] The parameter estimate of 0.5734 is obtained as the long run (steady-state) version of the (short-run) parameter of Equation 3.10. In particular, given the simple model $y_t = a_1 y_{t-1} + a_2 y_{t-2} + bx_t$, b is interpretable as the short-run coefficient of x. The corresponding long run parameter can be expressed as $\frac{b}{1-a_1-a_2}$. In the case of Equation 3.11, the long run coefficient is given by the solution of the following expression $\frac{0.0922}{1-0.8271-0.0120}$.

"Predicted decrease in the CC" column and produce a figure above 40 basis points for most of the European countries, corresponding to an (weighted) average figure for the EU of 36.7 basis points. As a result of the already low trading costs environment, Greece, Italy and Spain will gain less. Comparatively lower benefits are also expected for the UK because of the already large market depth (approximately € 2,500 billion in 2001).

Our projected reductions in the cost of capital are on average similar to that expected by financial market participants in our survey results discussed in Section 5. It is notable, in particular, that, of those who expected a reduction in equity yields as a result of financial market integration, 70% estimated a reduction of 50 basis points or less.

This analysis has focused on reductions in the cost of equity capital due to lower illiquidity costs, e.g. bid-ask spread and market impact costs. To the extent that the wider process of European financial market integration will also lead to reductions in other more direct trading costs, such as for example brokerage commissions due to a more competitive environment and/or lower clearing and settlement fees[37], the gains in terms of lower equity financing costs may be even larger.

In our macro-economic simulations, we will assume that, at a minimum, the costs of equity capital will fall by a further 10 basis points as a result of the effect of further integration and streamlining of cross-border transactions on direct or explicit equity transaction costs.[38]

3.4.4 Sensitivity to recent stock markets developments

We have also verified the sensitivity of our results to recent developments on European (and world) stock markets. We have computed the expected gains from integration by using two different lower levels of capitalisations for European markets. In one case, we have computed the benefits that would result from integrating the Euroepan markets with a level of capitalisation that is 10% lower of than the average level in 2001. This scenario produces an (weighted) average reduction in the cost of capital of 26.6 basis points.

In the second case, we have assessed the likely reduction in the cost of capital that would arise from integration of the European markets at the level at which they stood on the September 30th 2002 (showing, on average, a fall of

[37] See for example, the report of Giovannini Group (2001), Clearstream International (2002), Cruicchshank (2001) and Goldberg et al. (2002) on the excessive costs of cross-border clearing and settlement arrangements in the European Union at the present time.

[38] For example, the Clearstream International report notes that total cross-border transactions costs on a typical wholesale trade of about €200,000 is 5 to 7 basis points higher than the transactions costs on a similar domestic transaction even if liquidity costs are identical. The Giovannini report notes that per-transaction income of international CSDs is about 11 times higher than the per-transaction income of domestic CSDs. All this evidence suggests that, even in the absence of new technological trading system developments, there is considerable scope for explicit transactions costs to fall as a result of further financial market integration.

38% from the average levels in 2001). This exercise produces a figure of 24.1 basis points.

Although lower levels of market capitalisation reduce slightly the estimated economic gains from integration, the above analysis confirms that the creation of an integrated European stock markets has still the potential of delivering very sizeable benefits.

Table 3.6: Estimated Gains from Full Integration of European Stock Markets

Country	Current single countries' capitalisation 2001 (€, Billions)	Current TC as a percentage of price (averages 2001)	Predicted absolute changes in TC given a 1.008% TC level for the integrated market	Predicted percentage reduction of TC	Predicted decrease in the CC (basis points)
Austria	26.5	7.9%	6.9%	87.3%	50.1
Belgium	157.1	6.9%	5.9%	85.5%	49.0
Denmark	100.9	5.4%	4.4%	81.4%	46.7
Finland	196.9	5.2%	4.2%	80.6%	46.2
France	1,270.8	6.8%	5.8%	85.2%	48.9
Germany	997.7	5.3%	4.3%	80.9%	46.4
Greece	69.4	1.6%	0.6%	38.0%	21.8
Ireland	79.5	6.6%	5.6%	84.7%	48.6
Italy	658.9	2.8%	1.8%	64.4%	36.9
Luxembourg	25.6	6.9%	5.9%	85.5%	49.0
Netherlands	641.7	3.4%	2.4%	70.7%	40.6
Portugal	61.2	6.7%	5.7%	85.0%	48.7
Spain	397.9	1.3%	0.3%	23.4%	13.4
Sweden	254.8	4.6%	3.5%	77.9%	44.6
UK	2,530.3	1.9%	0.8%	45.7%	26.2
EU (sum)	**7,469.4**				
EU (weighted average)					**36.7**

NOTE: Single countries' capitalisations are averages for 2001; the total EU capitalisation is obtained as the sum of single countries' capitalisations; TC denotes trading costs; CC denotes the cost of equity capital; trading costs for Luxembourg are assumed to be the same of Belgium.

Source: London Economics' estimates.

3.5 Conclusions

In this section we quantified the likely impact of full integration of European financial markets on equity trading costs and on the cost of equity capital.

Building on the recent literature examining the link between a given stock's trading costs, the characteristics of the stock and the size of the stock exchange on which it is traded, we first developed and estimated an econometric model of trading costs and turnover using information on trading costs and stock characteristics of practically all the stocks traded over the period of January 2000 to December 2001 on the major stock exchanges of the OECD countries. Our empirical work suggests that trading costs could fall sharply as a result of full European financial market integration.

We then developed and estimated a model linking a firm's cost of equity capital to the trading costs of the firm's equity on secondary markets. As with previous studies of this issue, we find a strong, positive relationship between trading costs and the cost of capital.

We then used our models to estimate for each EU Member State the impact that the reduction in trading costs arising from full European financial market integration would have on the cost of equity capital. We find that the cost of capital would fall by more than 40 basis points for the majority of the European countries, corresponding to an average figure for the EU of 36.7 basis points. This estimate is very similar to the reduction of less than 50 basis points in the cost of capital expected by the vast majority of financial market participants participating in our survey (discussed in Section 5).

We have also tested the sensitivity of our results to recent developments on the stock markets. In particular, we have computed the benefits from integrating the European stock markets with a 10% lower capitalisation than the average 2001 and at the levels of 30th September 2002. The result is an average reduction of the cost of equity capital of 26.6 and 24.1 basis points respectively.

In our macro-economic simulations of the impact of European financial market integration, we will also allow for a further reduction of 10 basis arising from reduced clearance and settlement costs. This would imply a total reduction in the cost of equity capital stemming from full integration of European financial markets of approximately 50 basis points across each Member State.

4 European Financial Integration and Corporate Bond Markets

4.1 Introduction

The European bond market has particular features that impact on the way in which the process of financial integration will be felt. In many respects, this market has been international in character even before the introduction of the euro. Government debt securities from the euro area have in the past been the main form of international diversification for institutional investors, who were constrained by legal and other prudential restrictions in terms of size and composition of their foreign exchange and credit risk exposures. Also, the small size of national markets and the lack of asset managers interested in private credit exposures had obliged euro-area private bond issuers to tap other markets through international bond issuance. However, deeper financial integration will result in a more active and developed European corporate bond market.

Section 4 is organised as follows. The main features of the corporate bonds market are reviewed in Section 4.1. We begin with a general snapshot of secondary market trading of corporate bonds. Next, we review recent trends in the primary euro-denominated bonds market. Then, we review in greater detail the euro-denominated secondary market. Finally, we conclude this Section 4.1 with a brief review of recent trends in international bonds issuance.

The impact of financial market integration on the cost of corporate debt is assessed on in Section 4.2. In that section, we review separately the potential impact of European financial market integration on the risk-free rate, the credit spread, issuance costs and secondary market transactions costs. The bulk of the empirical work presented in section 4.2 relates to the impact of European financial market integration on the credit spread. Finally, Section 4.3 highlights a number of key conclusions.

4.2 Main Features of Bond Markets

4.2.1 Key features of corporate bond market

Institutions dominate the corporate bond market and their participation has been growing. In 1993, individuals owned 14% of total corporate debt in the US. In 1997, individual ownership of corporate bonds had decreased to 9%, with institutional investors owning the remaining 91% (Schultz 2001). Among institutions, life insurance companies have been traditionally the biggest debt-holders. Private pension funds are also important holders of corporate debt, particularly in the US. Public pension funds, mutual funds,

banks, other insurance companies, and savings institutions also hold significant proportions of outstanding corporate debt.

Almost all secondary bond trading in Europe and the U.S. takes place over the counter or, in recent years, over various electronic platforms.[39] While some active bonds are quoted on exchanges these are very much the exception rather than the rule.

In the US, recent estimates by the SEC put the proportion of exchange-based trade on corporate debt at between 0.5% and 1% of total transactions volume.

The non-electronic secondary market for corporate bonds resembles the way equities were traded several decades ago. An institution seeking quotes for a specific bond cannot see all quotes for the bond in one place. Instead, the institution must make several calls to a number of dealers, asking for quotes.

Alternatively, institutions may broadcast a list of bonds to sell (or buy), for example, through Bloomberg, and invite bids. More recently, the rapid growth in the number of electronic trading platforms have tended to create central market places for the bonds traded on the platform with more trading transparency, though access to this information is often restricted to the members of the electronic platform. At the end of 2001, there were in the U.S. at least 49 electronic systems that support trading in fixed-income securities and derivatives (Bond Market Association, 2001). While the number of such electronic platforms fell somewhat relative to 2000 as the result on consolidation and restructuring in the sector, the number of electronic platforms is considerably higher than a few years ago. For example, it is estimated that only 11 such electronic systems existed in 1997. Moreover, many observers believe that increased demands for better price transparency and market data will continue to push trading in fixed-income securities towards such electronic systems. For example, Celent, a specialised U.S. consultancy, recently projected that, by 2007, about 60 per cent of all trading in fixed income securities will take place through electronic systems (Celent, 2001).

Most bonds trade so infrequently that dealers do not broadcast quotes for them. There is usually an initial flurry of activity in a bond, following the first offering. Eventually though, bonds fall into the hands of institutions or retail investors who intend to hold them to maturity. Institutions buy bond issues in sufficiently large quantities that even the largest issues can be held by only 200 or fewer institutions. Thus, with the bonds in the hands of a small number of institutions that intend to hold them to maturity, trading declines to practically zero.

If an institution wants to buy or sell a bond that is not actively quoted, they can contact dealers to provide quotes. If the issue is an investment grade

[39] For more details on recent developments in electronic bond trading and their potential impact, see recent reports by the Committee on the Global Financial System (2001) and the Study Group on Fixed Income Markets (2001).

bond, dealers are usually able to provide a quote by comparing the bond to bonds with similar characteristics. Most of the variation in prices of investment grade bonds is a result of fluctuations in interest rates, so bid and ask quotes for investment grade bonds are given in terms of yield spread over the benchmark security of similar maturity.

High yield or junk bonds are more difficult to price. High yield bonds are not typically quoted on the basis of spreads over sovereigns, because their value, as is the case of equities, is affected mostly by firm-specific factors.

Because quotes are not automatically disseminated for inactively traded bonds, institutions may find they get very different quotes for the same bond from different dealers. Compared with other security markets, the lack of price transparency in the bond market is quite striking. This lack of transparency concerns regulators and investors alike, as it is feared that it leads to higher trading costs.

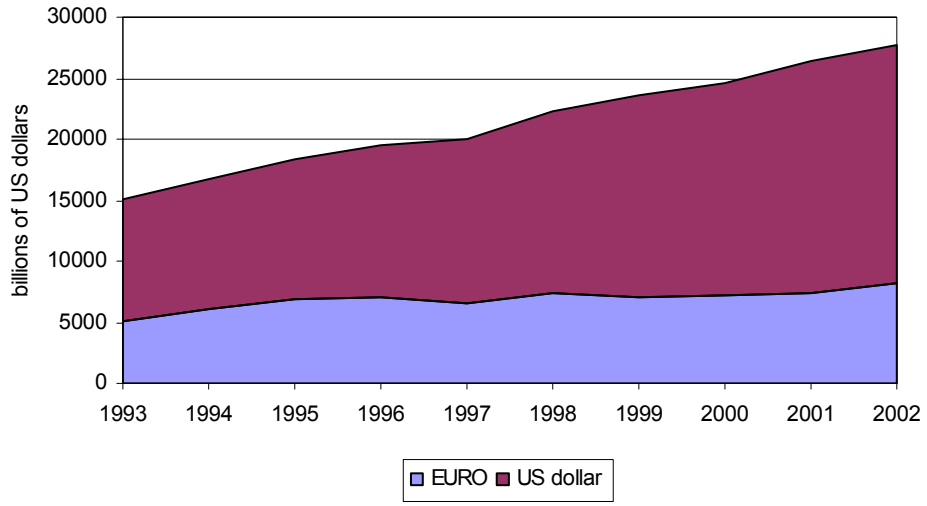
In summary, the bond market is characterised by relatively low trading frequency and high trading costs. In the next two sub-sections, we review in greater details recent developments in the primary and secondary markets for European government and corporate bonds.

4.2.2 Trends in the Euro-denominated Primary Bond Market

The overall size of the euro-denominated bond market by mid 2002 was $8,137.3 billion[40]. This is well under half the size of the dollar-denominated bond market total, the largest bond market in the world, with a value of $19,539.2 billion. As Figure 4.1 below shows, the recent years have not witnessed a reversal in these numbers. The dollar denominated market continues to attract a larger volume of net issuance.

[40] The data are sourced from the BIS. The total of debt securities outstanding is calculated by summing the amounts outstanding of domestic debt securities for all Eurozone countries (latest data from March 2002) with the amounts of international bonds and notes issued in euro (latest data from June 2002). Debt securities include money market instruments in addition to bonds and notes. The BIS only provides data on domestic debt securities aggregated to comprise both bonds and notes and money market instruments. A similar calculation is carried out to compute the number for totals outstanding in dollar denomination. The ECB provides data on debt securities issued by euro area residents, which does not include debt securities issued in euro by non-residents of the euro-area, a significant amount according to the data from the BIS: $5,027.1 billion are domestically issued in the euro-zone whereas $2,108.6 billion are internationally issued, denominated in euro. We have chosen the data from the BIS to analyse the evolution of the overall size of the two markets.

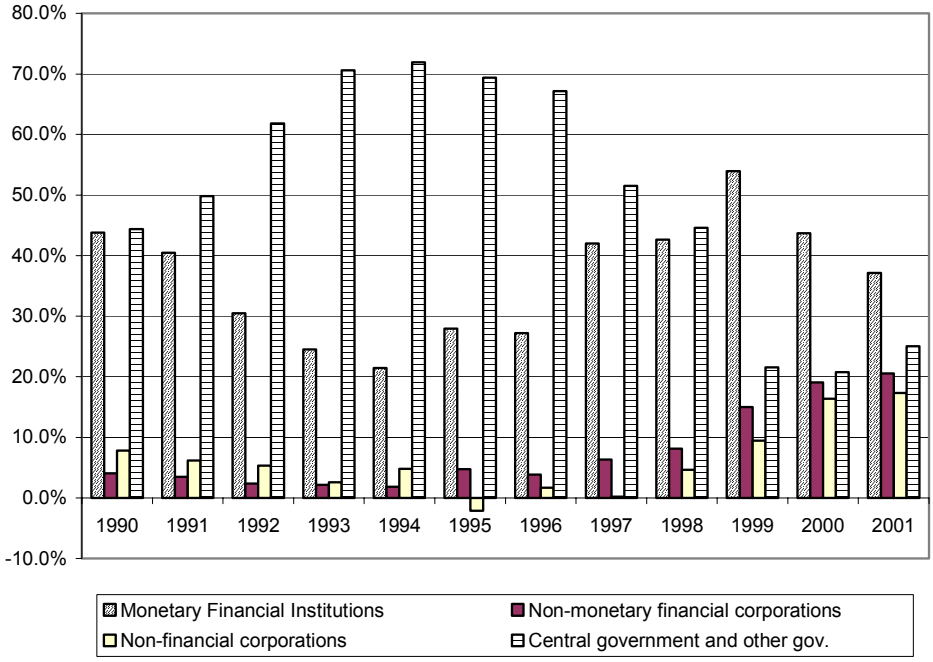
Figure 4.1: Total Debt Securities Outstanding by Currency of Denomination



Source: London Economics' calculations on BIS financial statistics.

The weight of corporate debt in the euro-denominated market is quite small, with just 6.4% of total outstanding in August 2002. While still small, this share shows a sharp upward trend in recent years, up from 5% at year-end 1998. This upward trend in the share of outstanding securities reflects a marked increase in the share of euro-denominated corporate bonds in the issuance of euro-denominated bonds (see Figure 4.2).

Figure 4.2: Net Euro Bond Issuance: Shares by Type of Issuer[41]



Source: London Economics' calculations on BIS financial statistics.

Despite the rising trend, the weight of corporate issuances in total bond issues in the US is still much higher than in Europe (Table 4.1).

[41] Source: based on ECB financial statistics. Debt securities issued by euro-area residents, by sector of issuer. Euro includes items expressed in the national denominations of the euro.

Table 4.1: Debt Securities Outstanding by Nationality and Type of Issuer

	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL								
US	10796.9	11693.9	12623.2	13970.7	15431	16336.8	17625.9	18256
EURO	7123.2	7377.4	6835.3	7729.5	7521	7715.9	7909.7	8523.7
Financial institutions								
US	21.8%	23.7%	26.4%	28.6%	30.1%	31.9%	32.0%	32.5%
EURO	40.3%	40.2%	41.2%	42.0%	45.0%	46.6%	47.0%	48.7%
Corporate								
US	16.2%	15.8%	15.6%	15.6%	15.6%	15.8%	15.6%	15.3%
EURO	3.8%	3.9%	3.9%	4.3%	5.4%	7.3%	8.7%	8.6%
Governments and state agencies								
US	62.0%	60.4%	58.0%	55.8%	54.3%	52.3%	52.4%	52.2%
EURO	55.8%	55.9%	54.9%	53.8%	49.5%	46.2%	44.3%	42.7%

Source: BIS

A large proportion of corporate issuance by EU nationals is denominated in currencies other than the euro. This may imply that EU-area corporations feel that the conditions they would receive for their issues in the euro-denominated market are less attractive than the conditions they receive in the dollar-denominated market, for example. Therefore, they choose to issue on this market even if presumably, other things being equal, they would rather issue in the currency of denomination of their assets.

It is true that, to a first order, firms should be indifferent to issuing in dollar or euro (or in any other currency) as firms can subsequently hedge the currency risk exposure in the swaps market. Corporations will assess at each point when they want to issue, how much appetite there is for their name in both the dollar-based and euro-based investment community.

Yet, the fact is that EU-area investors show a preference for EU-based companies, simply because they are more familiar with them than with a company in, say, Ohio, even if this last one issued in London in euro. The same holds true from the US point of view. [42]

In general, corporations have the majority of their debt denominated in the currency in which they hold most of their assets. But, they will also issue debt in other currencies if, for some reason, they perceive there is demand for their name among the investors in such debt instruments.

[42] A number of recent empirical studies show that the new corporate bonds and syndicated loans markets are still highly segmented along national lines in Europe (See, for example, Harm 2001).

In recent years there has been a clear trend for corporations to issue more and more debt in currencies other than their home currency. At the end of 1998, non-euro area issuers represented 13% of the outstanding amount of the euro debt market, while at the end of 2000 their share had risen to 18%. It is particularly striking that during 1999, non-residents accounted for 71% of net issuance. Market analysts have suggested that the extremely strong issuance by non-residents during 1999 may have represented a one-off rebalancing of portfolios by major US corporations, who may have replaced some portion of their dollar-denominated debt with euro-denominated debt, taking advantage of the emergence of the Euro as a major international currency.

For 2001 as a whole, issuance conditions were generally favourable due to the economic slowdown that contributed both to lower the attractiveness of equity and lower interest rates. Investor and borrower preferences thus shifted towards fixed-income securities. 2001 saw an increase in the share of private issuance, notably in the corporate sector.

But this trend has been interrupted in 2002 due to increasing government financing needs, as budgetary performance among euro-area Member States has deteriorated, and more difficult market access conditions for corporate issuers. The share of corporate issues was 10.7% in the first half of 2002, down from an average of 14.2% in 2001[43], and fell further to 3.6% on average in the third quarter of 2002 as new corporate issues more less dried up. However, this reduction in issues of euro-denominated corporate bonds is likely to be only a temporary, cyclical phenomenon and it is reasonable to expect that, as the economy recovers, liquidity requirements increase and confidence in the corporate sector is rebuilt, the upward trend in the share of corporate issuances in total euro-denominated issuances will resume again.

The years of 2000 and 2001 were marked by a relative stability in terms of the diversity of bond offerings across different levels of risk and yield classes, with issues on the AAA and AA classes accounting for an average of 70% of total issuance (Figure 4.3). In the first month of the current year issues in the AAA and AA classes constituted 77% of total issues, reflecting an even stronger bias towards low yield issues. BBB issues were just 5% of total[44] and largely dominated by telecommunications debt.

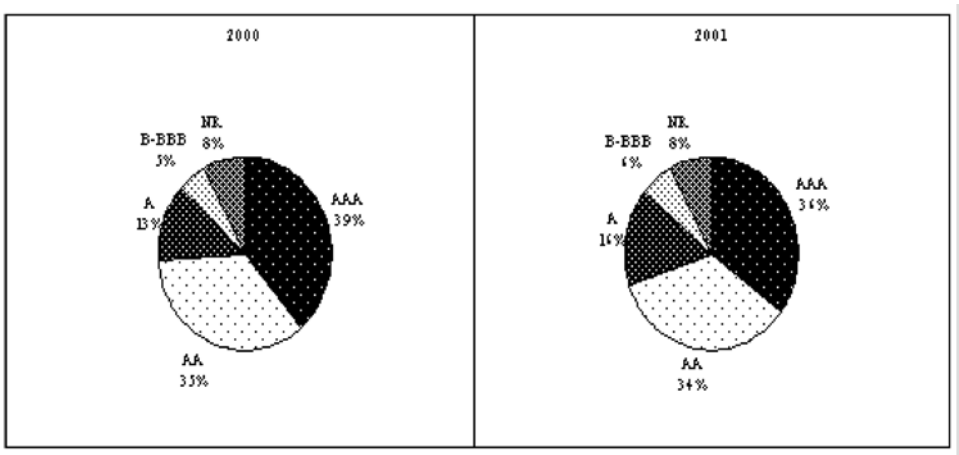
This implies that most new debt is very similar in terms of return characteristics, providing narrow diversification opportunities. Market analysts consider that there is an excessive bias towards low risk and low yield classes, dampening the incentives for major investors to have a strong weight of European bonds in their portfolios. According to these analysts, a strong issuance of higher yield bonds would be required in order for major investors to have the incentive to incur the cost of learning about a large

[43] European Commission (2002a). "Monthly note on the Euro-Denominated Bond Markets", Directorate-General for Economic and Financial Affairs, No.38, June.

[44] European Commission (2001b). "Quarterly note on the Euro-Denominated Bond Markets", Directorate-General for Economic and Financial Affairs, October-December.

number of European companies. Diversification in terms of high yield bond portfolios typically requires holdings of debt from a very large number of different companies.

Figure 4.3: Ratings of Euro Issues in % of Total Issued



Source: European Commission, Directorate General for Economic and Financial Affairs, Quarterly note on Euro-denominated bond Markets.

4.2.3 The Euro-denominated Secondary Bond Market

Policies of the European Union aimed at integrating European financial markets pre-date the introduction of the euro. Within such an institutional setting, the introduction of the euro may have been less of an institutional breakthrough, but, more significantly, may have contributed to alter the perceptions of market participants, in particular euro-area investors.

The available data on the euro bond markets seem to suggest a very slow pace towards regional diversification of bond holdings. The relative homogeneity of the euro area bond market is one relevant element in this respect. Portfolio adjustments are motivated by risk/return considerations. The portfolio benefits brought by diversification across debt holdings from different European issuers are limited when these issues all have similar risk/return characteristics. This is very much the case in Europe: half of the euro-denominated bonds are sovereign bonds and almost all euro area governments enjoy high and relatively homogenous credit ratings.

The diversification of bond portfolios is generally considered more difficult than the diversification of equity portfolios due to the nature of the return structure on bond holdings. Over a given time horizon the return on the bond holding is given by a large loss with a small probability (when the

issuer defaults) but there is no corresponding probability of a large gain. To diversify these large risks bond portfolios need to encompass very many bonds. Thus, diversification into riskier bond categories entails costs in terms of acquiring knowledge about a wide number of different issuers. A large portfolio size is therefore required for the gains from diversification to compensate for the costs.

Currently, secondary corporate bond trading in Europe is practically all in OTC form rather than in organized exchanges[45]. The OTC market operates on the basis of quotes provided by market makers and dealers on the one hand and brokers on the other hand. Market makers are generally investment banks. Market makers and dealers will, at any point in time, give bid and ask quotes for any given issue and for a given quantity that is requested by the client. The bid and ask prices, as well as the spread, will generally depend on the size of the order.

The market makers will generally offer different prices to different clients. The prices and the spreads depend on the strength of the relationship between the market maker and the client. There may be a long standing relationship, the client may be an important client in terms of the volume of business it brings to the market maker. Under these conditions the market maker is more likely to offer favourable conditions.

The prices quoted will also depend on the current position of the market maker with respect to the particular issue being requested. For example if the market maker is sitting on a big quantity of that paper they will be willing to give attractive prices for those looking to buy. If on the other hand the market maker has to go short in order to sell that paper then they will offer less attractive terms because they have to be compensated for increasing exposure.

The type of client also influences the likely terms that will be offered. For example, the market maker may expect a client like an insurance company to buy a large amount of some particular type of debt security and then sit on it for years. On the other hand, a fund manager may be expected to have different motivations for buying and these can imply more risk for the market maker who does the deal. Thus, the insurance company may get a better deal than the investment fund, other things being equal.

There are some exchange listings of corporate debt in Europe mostly in Luxembourg and in the London offshore market. The London offshore market is attractive to companies as it gives some tax advantages. Companies from all over Europe and US or Japan may list there. The listings can be denominated in Euro, dollar or yen. There is a minimum threshold firm size below which firms will not be allowed to issue debt in the London offshore market. This threshold has been significantly reduced in recent years. Most of the corporate bonds issued even if listed on the Luxembourg exchange will

[45] Government bond trading has already largely moved to electronic trading platforms.

not actually be traded there. They will be traded OTC. The European corporate bond market is not sufficiently liquid to be traded in an exchange, as it is too small and too information sensitive.

As background information on the size of secondary markets of bonds denominated in euro, ISMA examined, on a day chosen at random, the distribution by size of the trades reported on the ISMA-TRAX database.[46] On 27th June 2002, the total value of the trades recorded for euro-denominated bonds (sovereign, financial and non-financial corporations) amounted to €82,500 million, and:

1. 29% of the trades (by number of trades) were of a trade size less than €100,000 but accounted for significantly less than 1% of the total value of all trades;

2. 50% of the trades (by number of trades) were for amounts in excess of €1 million and 30% were for amounts in excess of €5 million.

As noted earlier in Section 4.2, many observers in the U.S. believe that increased demands for better price transparency and market data will continue to push trading in fixed-income securities towards such electronic systems. For example, some observes estimate that by 2007, about 60 per cent of all trading in fixed income securities will take place through electronic systems (Celent, 2001). As the systemic factors (i.e., desire for greater market transparency and market information) underlying the U.S. trends towards greater reliance on electronic trading platforms are also at play in Europe, it is likely that, in the years ahead, one will observe a similar substantial migration of trading in corporate bonds towards electronic systems.

4.2.4 Trends in International Bond Issuance

European corporations mostly issue on the London offshore market. There is very little issuance in domestic markets – for example a large enough Spanish company will issue debt in London not in the Spanish market.

This has been the current practice for some years and explains why the corporate debt market is already working at a stage close to a fully integrated market. The issuance of corporate debt instruments in domestic markets is very small, and mostly restricted to very short dated commercial paper.

More recently, even the very short dated commercial paper has being issued on the London offshore market. This implies that potentially a large part of the gains from financial integration have already been achieved when we think of the European corporate bond market in its present form.

[46] This will provide a comprehensive picture of wholesale secondary market activity as all ISMA reporting dealers (market makers) must use TRAX as must all ISMA members in the UK. It thus represents most of the process by which retail-oriented European banks acquire bonds for their clients and dispose of them if they cannot match sell orders in house. It does not include the internal process in these banks of breaking up blocks of new issues and selling them to retail clients.

But the overall size of the euro-denominated bond market is still significantly smaller than the dollar-denominated market. This difference can be at least partly be related to the fact that European issuers have traditionally not thought of the European market as an integrated single market. For reasons that are common to most forms of financial transactions, larger markets are more attractive than smaller markets, so in the past a large fraction of European companies chose to issue in the larger dollar-denominated market. The process of European financial integration can be expected to reverse, at least partially, this sort of self-fulfilling expectation.

Table 4.2 illustrates the trend towards a lower weight of domestic debt securities relative to international debt securities in total debt securities outstanding. Corporations and financial institutions, in particular, have shown a marked tendency towards reducing the relative weight of domestic debt issuance. In the last three years it has fallen from 59% to 48% and from 69% to 47% respectively.

Table 4.2: Domestic Debt Securities: Percentage in Total Outstanding

	1993	1994	1995	1996	1997	1998	1999	2000	2001
All									
UK	70.1%	71.1%	72.4%	72.7%	71.5%	69.9%	66.2%	61.2%	59.3%
US	98.1%	98.0%	97.6%	96.7%	95.6%	93.9%	91.4%	89.2%	87.4%
EURO	89.7%	88.7%	87.8%	86.4%	84.0%	82.3%	76.5%	71.1%	67.1%
Financial institutions									
UK	43.6%	46.4%	46.9%	51.0%	51.6%	51.5%	48.4%	41.6%	38.5%
US	93.2%	92.9%	92.1%	89.6%	87.4%	84.8%	81.4%	79.3%	77.3%
EURO	84.7%	82.2%	80.1%	76.6%	72.0%	68.9%	59.7%	52.2%	47.4%
Governments and state agencies									
UK	94.8%	94.8%	96.0%	96.5%	97.3%	97.5%	97.5%	97.4%	98.5%
US	100.0%	100.0%	99.7%	99.5%	99.4%	98.3%	96.6%	94.5%	92.9%
EURO	95.7%	95.7%	95.3%	95.3%	94.8%	94.5%	93.7%	92.8%	92.1%
Corporate issuers									
UK	44.7%	46.4%	47.0%	48.4%	50.1%	54.1%	54.1%	54.3%	56.7%
US	96.9%	96.8%	96.9%	96.6%	95.5%	94.9%	92.7%	91.3%	89.9%
EURO	62.4%	59.7%	59.1%	61.6%	60.0%	59.2%	58.4%	54.0%	48.1%

Source: BIS

4.3 Financial Integration and the Cost of Corporate Market Debt

4.3.1 Overview

To properly assess the impact of European financial integration on the cost of corporate market debt[47], it is important to consider the effects of the following fours factors separately:

- **The potential impact of European financial market integration on the risk-free rate.** Corporate market debt has to pay its holders at least this rate, plus some premium to induce investors to hold more risky corporate debt instead of the riskless (or practically riskless) sovereign debt. This is generally a benchmark rate for the entire corporate debt market, and issues are generally quoted in terms of yields over this benchmark[48].

- **The potential impact of European financial market integration on the credit spread.** This is the premium that investors require to hold corporate debt securities. Corporate debt carries risks, such as the risk of default on all or part of the payments promised by the bond. The credit rating represents the market perception of the likelihood of these risks and, naturally, the credit spread will be higher for corporations with lower credit ratings.

- **The potential impact of European financial market integration on issuance costs.** These are the various costs (underwriting fees, management fees and selling concessions) charged by financial intermediaries for bringing the new debt issue to the market and placing it with institutional and/or retail investors. This is a factor that does not affect the yield required by investors for holding bonds, but it impacts directly on a bond issuer's cost of debt.

- **The potential impact of European financial market integration on**

[47] The primary focus in this section is on the cost of debt capital for non-financial corporations as this has a direct impact on non-financial corporations' investment decisions. Financial institutions will obviously benefit as well from lower market debt costs. But, a priori, it is not obvious to what extent such gains will be passed on to their corporate clients in the short to medium term. However, as long as there is competition in debt markets, it is reasonable to assume that, eventually, any lower funding costs will be passed on by financial institutions to their clients.

[48] It should be noted, however, that in recent years financial market participants have also used the swap yield curve as a benchmark for corporate issues. This trend reflects the absence of a clear and consistent benchmark yield curve following EMU as the different segments of the sovereign benchmark yield curve are populated with issues from different sovereigns. For a more in-depth discussion of benchmark tipping in general see, for example, McCaulay 2001.

secondary market transactions costs. To the extent that investors plan to trade in the future their newly acquired bond holdings, the yield offered by a given bond has to compensate investors for the expected costs of their future trades on the bond. This is a factor which increases the required yield but that is not directly related to the credit worthiness of the issuing company.

In the following sections, we review how European financial market integration has affected so far, and will likely affect in the future, each the four components of the costs of debt capital.

However, before proceeding further, it is important to note three key characteristics of the European corporate bond market:

1. The size of the European corporate bond market is still very small compared to the U.S. corporate bond market. This reflects the fact that, for a variety of reasons, European corporations have relied so far mostly on loans by financial intermediaries rather than market debt;

- For example, the share of debt securities as a percentage of total liabilities of non-financial corporations stood at 2.4% in the euro-area versus 10.6% in the United States (ECB, 2001).

- Conversely, the share of loans as a percentage of total liabilities of non-financial corporations stood at 23.3% in the euro-area versus 5.4% in the United States.

2. So far there is little activity on the secondary market for European corporate bonds.

- The financial market participants[49] who we consulted in the context of this study confirmed that, at the present time, corporate bonds are largely held to maturity by the institutional and retail investors. While there may be a flurry of secondary market trading during the first days following a bond issue, this quickly dies down and after about a week there is very little trading.

- EuroMTS have added a limited number (14) of corporate bonds from 12 issuers to their trading platform and, in discussions with officials from EuroMTS, we have been informed that trading in these bonds has been very active. However, as this new service began only on March 11, 2002, it is still too early to predict with a high degree of confidence that the launch of such a platform, or the development of alternative platforms, will result in a more active and efficient secondary market for European

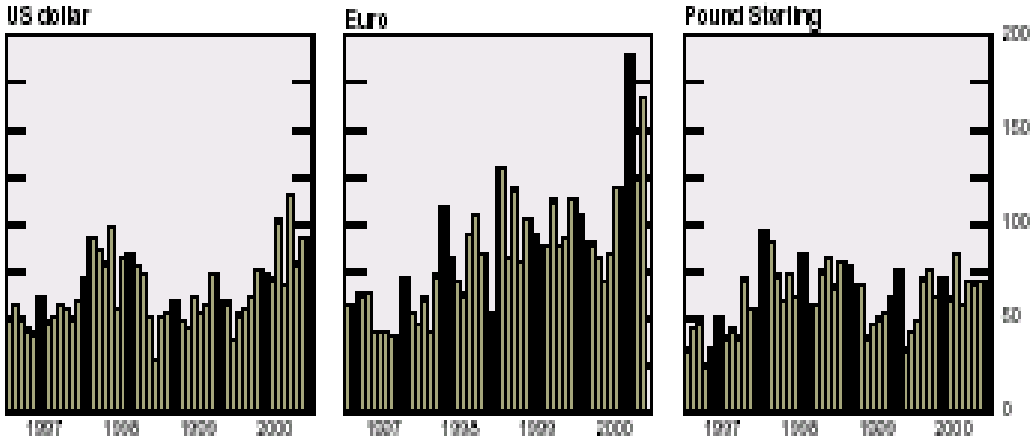
[49] We met with traders and representatives from ISMA and Euro-MTS.

corporate bonds. Nevertheless, these early signs are encouraging and the evolution of this new market place for European corporate bonds should be monitored closely in the future.

- Another tentative sign of an emerging "real" secondary market for Euro-denominated corporate bonds is the pick up reported by Euroclear in the average monthly turnover of the most active private bonds denominated in Euro (See Figure 4.4 - Galati and Tsatarounis, 2001). No such increase in secondary market activity is observed for corporate bonds denominated in US$ or £.

3. So far, most of the secondary market trading activity takes place over the counter, outside any central market place, and is not very transparent in terms of trading price and volume.

Figure 4.4: Turnover of Private Bonds



Source: Galati and Tsatsaronis (2001).

The process of European financial integration will improve the functioning of the euro-denominated bond market, not only because the market will be larger, more liquid and more competitive, but also because concurrent legislation is being developed with the objective of making cross-border capital movements in the euro-area truly seamless.

That being said, substantive work has yet to be done in terms of settlement and clearing systems. There is also a long way yet to go in terms of uniformity of corporate legislation, mainly in terms of bankruptcy regimes, hierarchy of stakeholders, speed and transparency of asset liquidations,

among others. Accountancy practices and disclosure laws still also differ widely across EU Member States.

All these discrepancies increase the costs for market participants. Uncertainty has a cost, and the need to learn many different types of national regulations constitutes a significant entry barrier. The fewer market participants there are, the more limited will be the amount of information flowing in the market. Investors will have difficulty identifying the correct price for the traded securities, and shy away from participating in the market. There will be overall less investment in market analysis. Thus, companies issuing debt will draw from a smaller than otherwise pool of investors and will likely pay for the fact that the market has poor information by offering correspondingly higher yields.

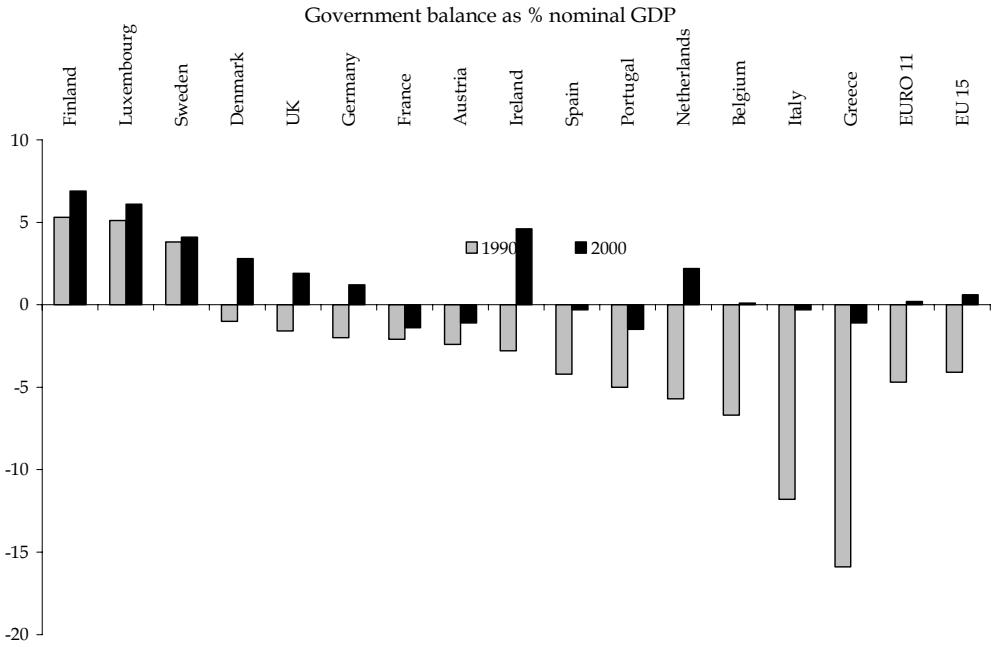
The gradual developments taking place will no doubt improve the flows of information in the market and thus improve the conditions under which firms can finance themselves in euro-denominated securities. Further and deeper financial market integration should result in improved market liquidity and market access conditions in terms of required yield.

4.3.2 Impact of European Financial Market Integration on Risk Free Debt Rate

The creation of the single currency, and the supporting macro-economic policies and rules, have so far had a significant impact on the risk-free rate (represented by the yield on government securities). Essentially, two main forces have been at play.

First, the Maastricht Treaty and Stability Pact have forced fiscally profligate and/or inflation prone countries to adopt tougher fiscal stances and more stringent monetary policies. As a result, government budget balances have improved significantly across the European Union (Figure 4.5).

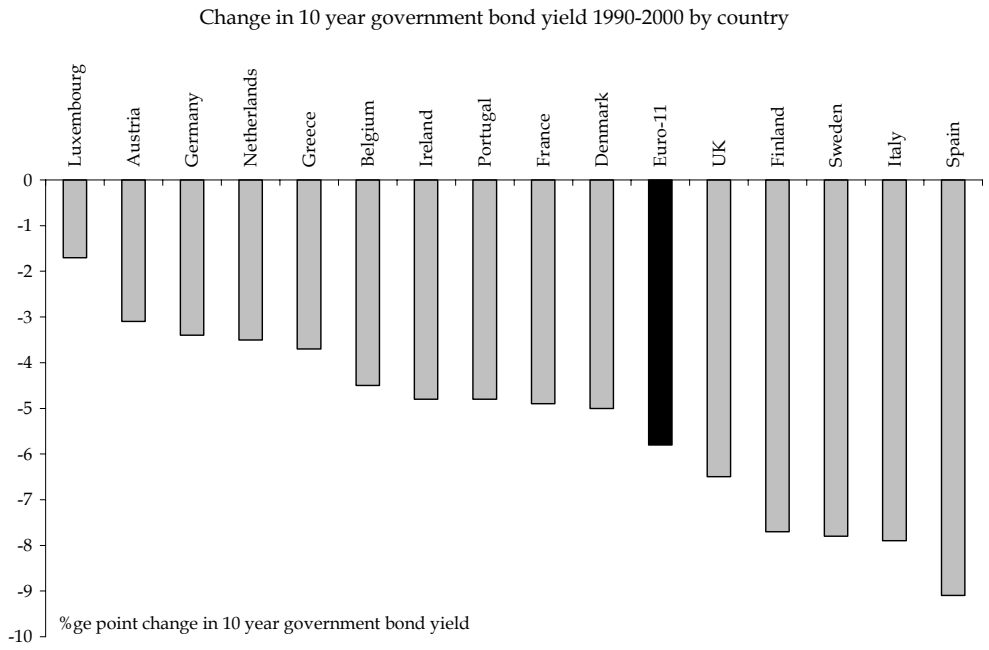
Figure 4.5: Lower Government Deficits across Europe



Source: ECB

This fiscal consolidation together with the pursuit of a distinctly anti-inflation monetary policy has resulted in a sharp fall of many countries' risk-free nominal interest rate. (See Figure 4.6) As high inflation is generally associated with uncertainty about future inflation and an uncertainty risk premium, it is most likely that risk-free real interest rates have also fallen in many EU countries.

Figure 4.6: Falling Government Bond Yields

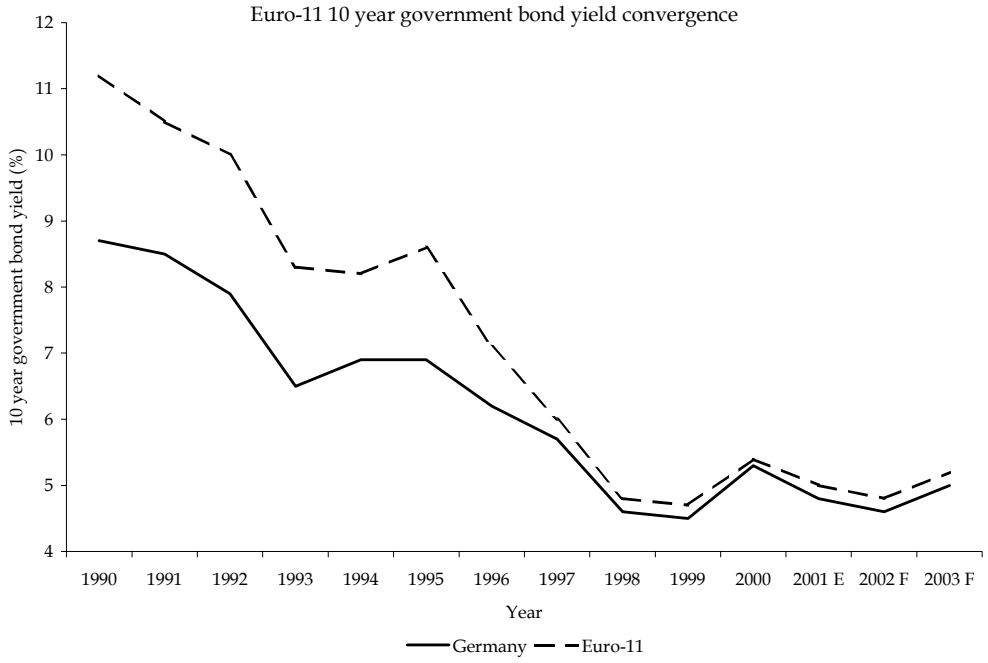


Source: ECB

The second impact is that, broadly speaking, the market has adopted the German government bond yield as its "reference rate", principally because it is the deepest and most liquid government security. [50] Spreads of 10-year sovereign debt relative to the German 10-year benchmark have fallen sharply (Figure 4.7) and recent empirical studies confirm that significant convergence has occurred in the post EMU period (See for example, Adam et al, 2002).

[50] As mentioned before, the swap yield curve is also used as a benchmark for Euro-denominated corporate bonds.

Figure 4.7: Convergence to German Bond Yields

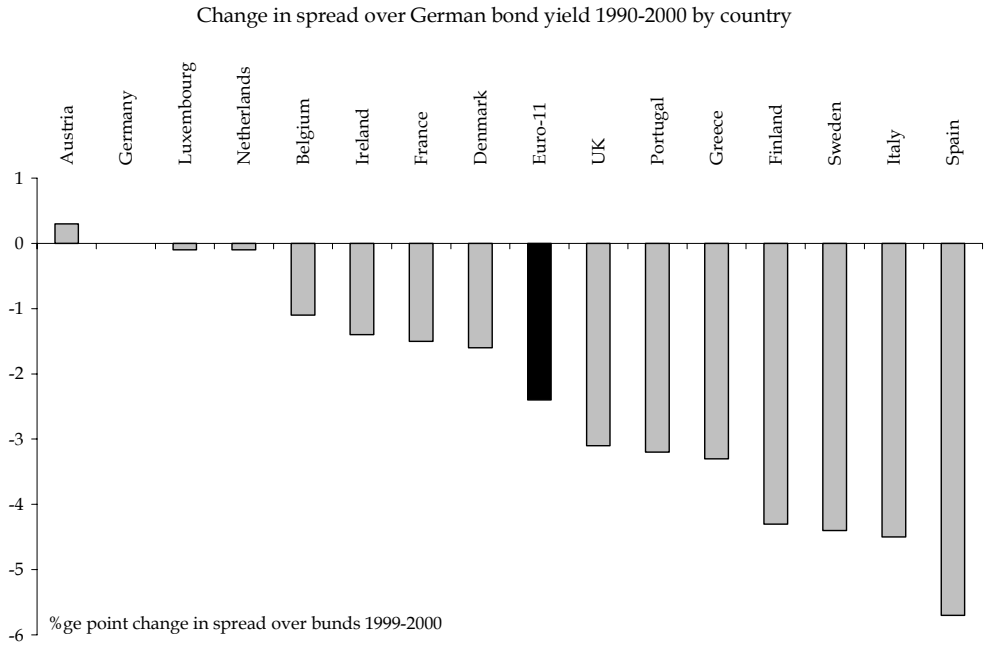


Source: ECB

Those countries with less prudent macro-economic policies in the early nineties (Spain, Portugal, etc) benefited most from the EMU-related declines in nominal yield spreads (Figure 4.8).

As noted above, there has been significant convergence of the spread between the 10-year domestic sovereign bond and the German 10-year Bund in the EU following EMU.

Figure 4.8: Changing Spreads over German Government Bonds



Source: ECB

For example, the standard deviation of the 10-year spreads fell from 85.9 basis point on average over the period January 1995 to December 1998 to 7.6 basis points on average over the period of January 1999 to June 2001. It should be noted that not all countries shared in these gains. Some, such as Luxembourg and the Netherlands, actually saw their spread increase (see Table 4.3 below).

Table 4.3: Average Spreads for Benchmark 10-yearYields*

Country	Spread relative to German 10-year, pre 1999 (1)	Spread relative to German 10-year, post 1999 (2)	Difference (2)-(1)
Austria	15.1	25.0	9.9
Belgium	31.8	31.0	-0.8
Denmark	85.5	37.3	-48.2
Finland	84.1	22.4	-61.7
France	20.8	12.6	-8.2
Greece	n.a.	n.a.	n.a.
Ireland	84.6	14.3	-70.3
Italy	261.9	32.2	-229.7
Luxembourg	-11.9	18.9	30.8
Netherlands	-0.60	14.2	14.8
Portugal	203.7	32.7	-171.0
Spain	207.6	27.7	-179.9
Sweden	171.3	26.7	-144.6
UK	130.4	19.4	-111.0
Standard deviation	85.9	7.6	--

NOTE: *Based on data for January 1995 – December 1998 for plc – 1999 spreads and data for Jan 1999 – Sept. 2001

Source: Adam et al. (2002)

The result in terms of the lower cost of corporate capital has been substantial for equity markets, bond markets, and bank finance alike. In all of these, the "risk free" rat**e** is the basis above which some form of risk premium is charged to compute the final required rate of return. The decrease in the risk free nominal and real interest rate is therefore directly reflected in a decrease in the nominal and real cost of corporate capital.

Are there further gains to be expected from deeper financial market integration? Our view is that the benefits in terms of reduction of the risk free rate that result from European financial markets integration have mostly already been achieved.

Therefore, we will assume in our macro-economic simulations that the risk-free will <u>not</u> fall further as a result of deeper European financial market integration. This may to some extent underestimate the potential impact of

financial integration. However, we do not envisage that this will be significant.

4.3.3 Impact of European Financial Market Integration on Credit Spreads on Corporate Bonds

Background

The main determinants of the credit spread or premium charged above the riskless benchmark typically are:

- The investors' risk assessment of a particular debt issue; and,
- The fit of the particular bond structure in the portfolios of major investors;

The risk assessment depends mainly on the risk of default on payments promised by the bond. There is no direct impact of financial integration on the probabilities of default. Projects involve risks and some projects will inevitably not succeed. However, it is possible that under financial integration the type of project that does not succeed is slightly different than under fragmentation. This potential effect has not, to our knowledge, been analysed in the literature.

That does not imply that European financial market integration has no impact on investors' risk assessment of European corporate bonds, as an additional and somewhat more subtle effect may also be at play as well. This point is addressed in greater detail below.

Financial integration may have an impact on the portfolios of major investors and on the way a particular issue affects the returns on those portfolios. In addition, as is well known by now, the return on a given asset should never be analysed in isolation but always as a component of a given portfolio.

As the European market becomes larger, investors will hold more European corporate debt and it is likely that new issues will have a better fit within these portfolios and be more easily priced. The potential for portfolio diversification is improved and investors will take advantage of these opportunities to improve the risk/return relationship in their portfolios.

The most substantial effect from European financial integration is likely to be on the size and the liquidity of the market. A market where issues are very thinly traded, if traded at all, is one where the pricing mechanism does not work effectively. Participants lack information to carry out their transactions, and intermediaries protect themselves from lack of information by charging large bid-ask spreads. Investors buying a particular issue will be concerned with the difficulty and costs involved if later on they were to sell their holdings.

This creates a vicious circle where market participants are few, transactions are costly and take place far apart, and the size of the market remains small.

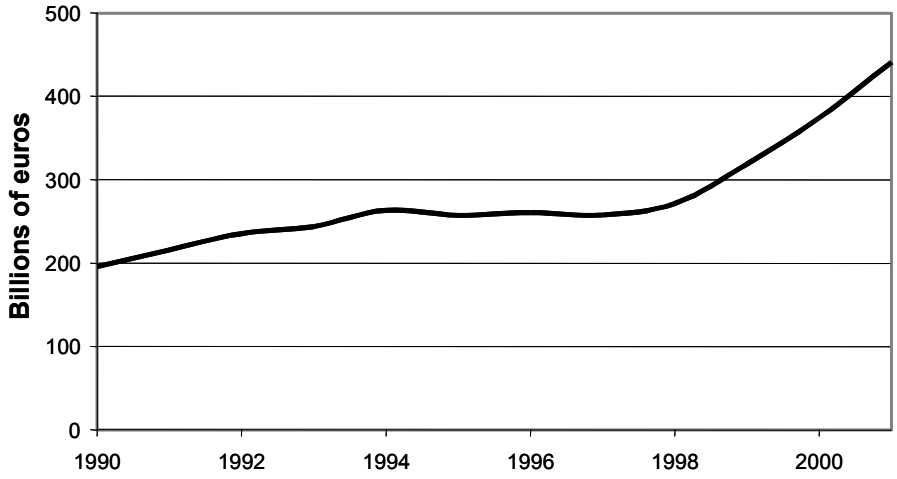
Financial integration creates the potential for a larger market and its impact is already being felt.

It is undoubtedly expected that the process of European financial integration will improve the attractiveness of the euro-denominated financial markets to both euro-zone nationals and international investors.

Corporate debt and sovereign debt are generally not considered by investors to be "in the same class" in terms of portfolio allocation. Therefore, from the point of view of euro-area corporations it is the market size with respect to the securities that are potential sources of risk diversification for their own corporate bonds that is relevant.

The increasing size of the non-financial private sector euro-denominated bond market is evidenced in Figure 4.9. We can see that the growth in importance of the non-financial private sector has been especially marked in the years after EMU and the move to irrevocably fixed exchange rates[51].

Figure 4.9: Euro-Denominated Non-Financial Private Sector Bonds Outstanding



Source: ECB

A larger market provides investors with wider diversification opportunities making each single issue more attractive, e.g. for a given risk level the required risk premium will likely fall.

Moreover, the diversification channel implies also that the market will be more receptive to higher yield risks, where the need for and gains from portfolio diversification will be most felt. It is possible that, as the total

[51] Some of the growth is attributable to the telecommunications sector that issued substantial amounts of debts to finance a wave of acquisitions and the UMTS licences (ECB, 2001).

volume of Euro-denominated corporate bonds grows, investors become more familiar with the risk characteristics of European corporations and are better able to properly assess such risk. Hence, they may require a somewhat lower risk premium in a deeper and more mature primary market than in a nascent primary market.

As noted above, the introduction of the Euro has given rise to a flurry of Euro-denominated corporate bond issues by Eurozone residents and non-residents and in the following section we will examine empirically whether the growth in the value of the stock of outstanding Euro-denominated corporate bonds issued by European corporations has reduced credit spreads over time. In other words, we will examine whether a type of "learning and familiarization effect" is at play in the developing market for Euro-denominated corporate bonds issued by European companies.

Does the growth in the stock of outstanding Euro-denominated corporate bonds issued by European companies affect the credit spreads?

The Gabbi and Sironi study

The starting point of our investigation is the very recent work by Gabbi and Sironi (2002) who examine which factors are the most relevant in determining corporate bond pricing. They analyse the issuance spreads of Euro-denominated corporate bonds completed by Canadian, European, Japanese and U.S. companies during the 1991-2001 period. For their work, they use databank[52] containing information on the characteristics of 3,403 Euro-denominated corporate bonds issued by such companies during the 11- year period.

Their key empirical findings are that, for their sample of Euro-denominated corporate bonds, the ratings of corporate bonds are the most important determinant of the spread between the yield to maturity of the Euro-denominated corporate bond and that of an equivalent Treasury security. Second, the importance of rating judgments has grown over time. Third, a bond's expected tax treatment matters and fourth, bond-specific primary market efficiency variable and expected bond-specific secondary market liquidity have little or no explanatory power.

Our model

We will apply the general spread determination model used by Gabbi and Sironi to the sub-sample of Euro-denominated corporate bonds issued by European non-financial companies from 1997 to 2001 in the their databank[53]

[52] The data are taken from two main sources: Capital Data BondWare and Moody's Corporate Default.

[53] We would like to thank Professors Gabbi and Sironi for having shared their databank with us.

and test the hypothesis that the cumulative stock value of Euro-denominated corporate bond issued since 1991 by all the European non-financial companies reduces the credit spread required by investors[54].

More precisely, the hypothesis that will be tested is whether there exists a negative, most likely non-linear, relationship between the cumulative stock and the credit spread.[55]

The model that will be estimated is the following[56]:

Credit spread = f (the credit rating of the issue, the size of the issue, the number of years to maturity, the coupon rate, the industry of the issuer, the year of the issue, and the cumulative stock of Euro-denominated corporate bonds)

All the Euro-denominated corporate bonds in the sample are fixed-rate bonds and there are 90 issues by 42 different European non-financial companies for which all the necessary data are available in the databank for the period 1997 – 2001.

The "credit spread" variable is the difference between the yield to maturity at the launch of a specific issue and the yield to maturity of a corresponding government debt instrument with a similar maturity.

The "credit rating" variable is a series of dummy variables that each takes the value of 1 for a specific Standard and Poors/ Moody's rating and 0 otherwise. The credit rating is the one given at the launch of the issue. There are 17 such dummies (see Table 4.4 for details)[57]. A lower credit rating is expected to result in a higher credit spread. The variable "size of the issue" aims to capture the effect of the issue's specific liquidity on both the primary and secondary market. A larger issue is anticipated to result in a more liquid market secondary market, if such a market were to develop, and hence may result in a lower credit spread. That being said, a larger issue may be more

[54] Our work focuses only on the euro-denominated bonds issued by non-financial corporations as financial institutions have been present for many years in the euro/ecu market and do not face a problem of inverstors' lack of familiarity with the bond issuer. Similalry, we omit from our sample older bonds in legacy currencies issued by non-financial European companies as only a limited number of such issues were made and they were almost entirely targeted at investors of the issuing entity's home country.

[55] As it is plausible to assume that the incremental effect of learning or familiarisation decreases with the growth in the stock of outstanding Euro-denominated corporate bonds, the stock variable will be used in logarithmic form in the equation.

[56] A number of other bond characteristics (the seniority of the bond, whether the bond is registered, the number of financial institutions involved in the bond issuance, the gross issuance fees, the nature (private or public) of the issue, etc) were found to be not statistically significant in preliminary investigations of the data in our sample and, hence, were not used in our model.

[57] Risk dummies are included in the model only for the risk rating categories of the bond issues present in our sample.

difficult to place in the primary market and may put upward pressure on the credit spread. The net effect of these opposing forces on the spread is thus uncertain.

Table 4.4: Number of Issues per Rating Class

Rating class – Standard and Poors	Number of issues
Risk 1: AAA	21
Risk 2: AA+	3
Risk 3: AA	9
Risk 4: AA-	7
Risk 5: A+	5
Risk 6: A	9
Risk 7: A-	7
Risk 8: BBB+	12
Risk 9: BBB	9
Risk 10: BBB-	0
Risk 11: BB+	0
Risk 12: BB	0
Risk 13: BB-	2
Risk 14: B+	1
Risk 15: B	7
Risk 16: B-	6
Risk 17: CCC+	1

Source: London Economics' estimates on Gabbi and Sironi data.

The variable "number of years to maturity" measures the expected life of the bond. Longer maturity bonds are more risky and, everything else being equal, will likely require a higher credit spread.

The "coupon rate" variable is the annual coupon paid by the bond. According to Gabbi and Sironi, a positive coefficient is expected because, everything being equal, bonds with lower coupons may be more valuable. This is because, if the bond is likely to be sold, some of the taxes (capital gains taxes) may be postponed until the time of the sale. That being said, a higher coupon may also simply reflect a higher credit risk.

The "industry" variable is a dummy variable capturing industry-specific effects on credit spreads and takes the value of 1 if the bond issuer belongs to a specific industry and a value of 0 otherwise. In total, there are 9 industry dummies -- chemicals, electronics, energy & utilities, engineering, food & drink, manufacturing, media & publishing, oil, coal & gas, and telecommunications.[58]

[58] The other industry dummies used by Gabbi and Sironi are not included as no European companies of these sectors are recorded in the databank as having issued Euro-denominated corporate bonds over

The "year " variable is a dummy variable capturing year-specific effects on credit spreads and takes the value of 1 if the bond issue occurs in a given year and 0 otherwise. Special year effects are included for the years 1998, 1999, 2000 and 2001.

Finally, the variable "cumulative stock of Euro-denominated corporate bonds" is the value in Euro of the cumulative amount of Euro-denominated corporate bonds issued by the non-financial European companies in the databank.

The original databank provided by Gabbi and Sironi contains information on 8,899 fixed rate international bonds issued from 1991 to 2001 (Table 4.5). European residents[59] issued 3,297 fixed rate bonds over this period, using a variety of currencies. Of this total, 855 bond issues were Euro/Ecu issued, with almost 88% of these bonds being issued over the period 1997-2001.

Table 4.5: Number of Bond Issues in the Databank 1991-2001

Total number of bond issues – all currencies	9049
Total number of fixed rate bond issues – all currencies	8899
Total number of fixed rate bond issues issued in all currencies by European residents	3297
Total number of fixed rate bond issues issued in Euros by European residents 1991-2001	855
Of which, by non-financial companies	260
Of which, by financial companies	536
Of which, by government institutions	59
Total number of fixed rate bond issues issued in Euro by European residents 1997-2001	750
Of which, by non-financial companies	247
Of which, by financial companies	465
Of which, by government institutions	59

Source: London Economics' estimates on Gabbi and Sironi data.

the period 1997-2001. These additional sector dummies used by Gabbi and Sironi are for the automotive, construction, computer and software, health care and pharmaceuticals, hotel and leisure, industrials, retailing and consumer goods, railways and transport sectors.

[59] E.g., the residents of the 15 EU countries.

Over the period 1997-2001, more than 60% of the Euro-denominated corporate bond issues undertaken by European residents were launched by financial sector companies and only 247 issues were undertaken by European non-financial corporations. Of the latter, detailed data on a number of bond characteristics are available only for 90 bonds. This is the sample set that is used in our empirical work.

A number of sample data summary statistics are reported in Table 4.6. The key facts to note are the following:

- The average credit spread in our sample is 204.33 basis points and ranges from 16 to 1014 basis points;
- The average nominal coupon rate is 6.63% ranging from 3.5% to 14.5%.
- The average number of years to maturity is 8.61 years and ranges from 3 to 20 years;
- The size of the average bond issue is €634.79 million and ranges from €50 million to €3500 million; and
- Finally, the risk ratings range from AAA to CCC+ in the sample. Table 4.4 above provides information of the full distribution of risk ratings across the corporate bonds in the data sample.

Our model was estimated cross-sectionally. The model was estimated first with only the risk rating dummies and a constant (model 1 in Table 4.7). The model was then re-estimated with all the other explanatory variables discussed above except that the cumulative stock is omitted (model 2). Model 3 includes the stock variable and the most parsimonious model (model 4) includes only the variables that were found to be statistically significant.

This stepwise approach to the empirical analysis of the key determinants of the credit spreads on non-financial European corporate bonds was adopted to better assess the relative influence of each of the three sets of variables.

Table 4.6: Sample Descriptive Statistics

	Sample mean	Sample Standard Deviation	Sample Minimum	Sample Maximum
Credit spread, in basis points	204.33	260.78	16	1014
Nominal amount of issue (millions of Euro)	634.79	621.22	50	3500
Nominal coupon rate, in %	6.63	2.75	3.5	14.5
Number of years to maturity	8.6	3.26	3	20
Cumulative stock of Euro-denominated corporate bonds issued (millions of Euro)	40974	--	13033.98	70840.8

Source: London Economics' estimates on Gabbi and Sironi data.

Table 4.7 contains the detailed estimation results from our credit-spread model in relation to euro-denominated corporate bonds issued by European non-financial corporations between 1997 and 2001.

A number of the estimation results displayed in that table are worth highlighting, as follows:

1. Credit risk rating is a key determinant of the credit spread. As shown by the results of model 1, the credit risk dummies alone explain 94% of the variation in observed credit spreads;

2. However, as shown by the F-tests reported in Table 4.8, it is only the lower credit ratings that do have an effect on credit spreads. This may reflect the fact that, for the better rated bonds, the credit rating did not add any information that is not already contained in the other explanatory variables of the model;

3. The results of the models 2 to 4 show that including additional explanatory variables increases the explanatory power of the model and reduces the root mean square error by about 50%;

4. The results of model 2 show that both the number of years to maturity,

and the level of the coupon rate are statistically and economically useful additional explanatory variables. These results hold for all models reported in Table 4.7:

- The sign of the "coupon" variable is positive as expected. A 100 basis point increase in the coupon rate widens the credit spread by about 50 to 60 basis points, depending on the model;

- However, the sign of the "years to maturity" variable is negative suggesting that, everything else being equal, a longer maturity bond requires a lower spread than a shorter maturity bond. According to the estimation results, doubling the maturity of a bond from 5 to 10 years would reduce the credit spread by about 21 to 27 basis points depending on the model. There exist no good, generally accepted, explanations for this result. One possible explanation is that, in a low inflation environment, some investors do not like having to deal frequently with asset re-investment issues and prefer investing, everything else being equal, in longer maturity securities.

5. The size of the bond issue is never a statistically significant explanatory variable;

6. Most of the industry dummies are not statistically significant.[60] This is confirmed by the F-tests reported in Table 4.8. The only two exceptions are the media sector and the telecoms sector. This suggests that, in general, investors do not impose an industry-specific risk premium over and above the risk that is already reflected in the credit rating. However, in the case of telecoms, it would appear that a small additional, sector-based, risk premium of about 20 to 28 basis points was required by investors while the media sector appears to have benefited from a significant goodwill factor, with a sector-specific reduction in the credit risk premium of more than 100 basis points;

7. The year dummies are highly significant, suggesting that general financial market conditions are also an important driver of credit spreads;

8. Finally, and most importantly, the cumulative euro-denominated corporate bond stock variable is statistically significant (models 3 and 4) and its addition increases the explanatory power of the model[61] and does

[60] To avoid problems with multi-collinearity, the dummy for the "other industries" was dropped. Similarly, there is no year dummy for 1997 in the model. Therefore, the constant is to be interpreted as the constant that applies to the "other industries" group in 1997.

[61] To avoid any possible reverse causality effect, the stock variable was entered in the model with a one-

not affect the statistical significance of the other explanatory variables. This clearly indicates that the "learning and familiarisation" factor is a statistically important additional determinant of the credit spreads observed over the period 1997-2001.

quarter lag.

Table 4.7: Estimation Results of Credit Spread Model - Euro-Denominated Corporate Bonds Issued by European Non-Financial Corporations1997 to 2001

Dependent variable = credit spread (in basis points)	Estimated coefficient (t-statistic in parenthesis)			
Explanatory variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Constant	34 (2.18)	-255.54 (4.70)	444.05 (1.61)	250.10 (1.08)
Risk Dummies				
Risk2	14.33 (0.38)	-18.59 (0.81)	-16.06 (0.73)	
Risk3	32.21 (1.17)	-12.02 (0.67)	-16.82 (0.98)	
Risk4	17.50 (0.60)	-1.57 (0.08)	-12.50 (0.67)	
Risk5	38.10 (1.22)	-1.93 (0.09)	-10.17 (0.50)	
Risk6	44.52 (1.75)	-7.79 (0.44)	-6.23 (0.37)	
Risk7	101.47 (3.68)	-7.44 (0.35)	-23.58 (1.11)	
Risk8	91.31 (3.91)	25.19 (1.30)	21.59 (1.17)	
Risk9	108.33 (4.26)	14.96 (0.76)	1.35 (0.07)	
Risk13	649.00 (14.29)	301.54 (6.04)	248.57 (4.79)	282.87 (7.32)
Risk14	514.00 (8.25)	170.41 (3.26)	142.83 (2.80)	178.84 (4.57)
Risk15	595.57 (21.57)	262.97 (5.50)	232.10 (4.91)	257.06 (7.80)
Risk16	801.67 (27.52)	355.33 (5.89)	308.59 (5.10)	343.74 (7.77)
Risk17	793.00 (12.73)	309.45 (4.57)	281.35 (4.29)	309.96 (5.91)
Years to maturity (number of years)		-4.27 (2.44)	-5.23 (3.06)	-4.85 (4.50)
Amount of the issue (€ millions, in logarithm)		-4.52 (0.74)	-5.20 (0.89)	
Level of coupon rate (in %)		52.55 (7.72)	57.89 (8.48)	54.54 (10.10)
Cumulative stock of Euro-denominated corporate bonds issued by non-financial European companies (€ millions, in logarithm)			-74.92 (2.58)	-53.23 (3.12)
Industry Dummies				
Chemicals		-13.33 (0.66)	-16.83 (0.86)	
Electronics		-18.33 (0.50)	-8.23 (0.32)	
Energy & utilities		-0.54 (0.05)	1.26 (0.11)	
Engineering		-26.21 (1.11)	-26.05 (1.15)	
Food & drink		-21.02 (0.82)	-24.73 (1.10)	
Manufacturing		9.24 (0.45)	15.97 (0.80)	
Media		-122.80 (3.21)	-102.60 (2.75)	-111.67 (3.12)
Oil, coal and gas		21.50 (1.19)	19.46 (1.13)	
Telecoms		27.83 (2.11)	23.94 (1.89)	21.01 (2.25)
Year dummies				
1998		86.35 (2.16)	91.40 (2.39)	51.04 (1.52)
1999		188.54 (3.38)	161.46 (4.32)	116.90 (3.45)
2000		86.29 (2.35)	159.68 (3.53)	103.11 (2.63)
2001		137.81 (3.80)	244.63 (4.53)	183.22 (3.97)
Summary statistics				
Number of observations	90	90	90	90
Adj. R-squared	0.9465	0.9864	0.9876	0.9871
Root MSE	60.31	30.44	29.09	29.59

Source: London Economics' estimates on Gabbi and Sironi data.

Table 4.8 below presents the results of the F-Test in relation to the joint statistical significance of the risk and industry dummy variables used in our model. The results show that 1) the risk dummies 2 to 9 are jointly not statistically different from zero and 2) the industry dummies other than the media and telecommunications dummy variables are jointly not statistically different from zero.

Table 4.8: Joint Statistical Significance of Risk Dummies and Industrial Dummies in model 3 - Result of F-test

Risk dummies		**Industrial dummies**	
Risk2 to Risk17	F = 4.54*	Chem. Ele, Eng. Food, Man. Media, Oil, Tel.	F = 2.27*
Risk2 to Risk9	F = 1.38	Chem. Ele, Eng. Food, Man. Oil,	F = 0.81

F test of hypothesis that risk dummies are jointly statistically different from zero.
* = statistically significant at 1%.

Source: London Economics' estimates on Gabbi and Sironi data.

How significant is the "learning and familiarisation" effect in recent years? The estimation results suggest that overall the impact has been very substantial as the rapid growth in the stock of Euro-denominated corporate bonds since January 1999 is estimated to have contributed to reduce the credit spread by about 90 basis points.

What about the future? Assuming that the "learning and familiarisation" continues to affect credit spreads in the future as it did in recent years, a doubling of the current stock of Euro-denominated corporate bonds issued by European non-financial corporations would reduce, everything else being equal, the credit spread paid by these corporations by a further 50 basis points and a tripling by about 90 basis points relative to the current level.

However, it may be unduly optimistic to assume that the "learning and familiarisation" effect will continue to affect credit spreads in the future with the same intensity as in the past, especially as some of the growth in the stock of Euro-denominated corporate bonds was due to a one-off and exceptionally large recourse to debt markets by telecommunications companies. We address this issue in greater detail in the next section.

Impact of further European financial market integration on corporate debt in the macroeconomic simulation

A key issue is how to define further financial market integration in the case of the Euro-denominated corporate bond market.

One possibility would be to assume the lifting of all legal and regulatory restrictions that currently prevent or make it more difficult for institutional and retail investors to invest freely in Euro-denominated corporate bonds issued by companies from outside their home country. This should result in a deeper, pan-European market for European corporate bonds.

At the same time, one can plausibly envisage that the current heavy reliance on bank financing would gradually decrease as corporations find it easier to access to the bond market as the market develops and matures.

In Table 4.9 we compare the current structure of non-financial corporate debt liabilities in the EU and the United States, and develop a number of scenarios in relation to the gap between the EU and the US in terms of the share of debt securities in total corporate debt liabilities.

Table 4.9: Structure of Non-Financial Corporate Debt Liabilities in the EU and United States

	1997	1998	1999	2000	2001
USA					
Share of debt securities in total debt liabilities[1] (in %)	61.5	61.9	62.8	67.3	64.2
EU					
Total debt liabilities (in billions of €)	2707	2848	3042	3440	3980[2]
Share of debt securities in total debt liabilities (in %)	11.2	11.5	11.4	11.4	11.4[2]
Scenarios					
Debt securities (in billions of €) in EU if gap between share of debt securities in total corporate debt liabilities in EU and US were closed by (%)					
0%					453
25%					997 (+120%)[3]
50%					1523 (+236%)
75%					2067 (+356%)
100%					2602 (+474%)

Source: FRB (2002) and ECB (2002d and e)

1. Excluding trade payables and tax payable
2. Forecast
3. Percentage increase relative to base level of 453

Source: London Economics' estimates on Gabbi and Sironi data.

Our central scenario will assume that over the medium-term, say the next ten years, the structure of debt financing of European companies will move gradually towards the typical U.S. structure, closing the gap by perhaps a quarter or half.

As the estimates reported in Table 4.9 show, closing the gap by 25% would require a 120% increase in the stock of outstanding non-financial corporate bonds and a 236% increase in the stock would be required to close the gap by 50%.

According to the credit spread model estimation results reported in Table 4.7 such an increase in the stock of outstanding non-financial corporate bonds would result in a drop of about 60 basis in the credit spread if the gap were

closed by 25% and a drop of about 90 basis points if the gap were closed by 50% (Table 4.10).

As a test of the sensitivity of the estimates of the reductions in the credit spread, the same exercise was repeated using this time the lower bound of the confidence interval around the estimated coefficient of the stock variable in model 3. The corresponding projected reductions are 13 basis points and 21 basis points respectively.

Table 4.10: Impact on Credit Spread of Increases in Stock of Bonds[1, 2]

	Estimated impact on credit spread in basis points, using the model 4 coefficient reported in Table 4.7	**Estimated impact on credit spread in basis points, using the lower bound of the confidence interval around coefficient reported in Table 4.7**
Increase in the stock of euro-denominated corporate bonds		
120%	-59	-13
236%	-92	-21
356%	-113	-25
474%	-130	-29

1. Using the estimation results reported for model 4 in Table 4.7
2. Total reduction of credit spread relative to credit spread level that would prevail at current level of the stock of euro-denominated corporate bonds

Source: London Economics' estimates on Gabbi and Sironi data.

Overall, it would thus seem reasonable to assume that a further deepening of European financial market integration, accompanied by a slow convergence of EU and US corporate debt structures and a rapid growth of the market for Euro-denominated corporate bonds issued by European non-financial corporations[62], could result in a further decline in the credit spread on such bonds of about 40 basis points.[63] As noted in the discussion above, this is based on the assumption that the share of bond finance in total debt finance

[62] It is important to note that the growth in the market is assumed to arise because of the market deepening. Without further financial market integration and further widening of the investor base, the growth in the stock in euro-denominated corporate bonds would not be as strong as expected in our scenario. Thus, further financial market integration is a necessary condition for the continued rapid expansion of the euro-denominated corporate bond market.

[63] This is the rounded average of the central and lower-bound estimates of the reduction in credit spread that would arise from a 25-per-cent reduction in the gap between the EU and US shares of bonds in total debt liabilities of non-financial corporations.

would grow so as to reduce by 25% the current difference between the U.S and the EU shares of bond finance in total finance.

Because, the primary bond market is already largely pan-European in scope, we will assume that all corporations from EU Member States will benefit equally from such a reduction in the required yield on new bond issues.

It should be noted that the assumption of a 40 basis points reduction in the costs of new corporate market debt is somewhat more conservative than the results of the survey of financial market participants on the their views of the likely impact of financial market integration on corporate bond yields (details in Section 5 of this report). Of those who felt that bond yields would decrease, 85% expected a reduction of 50 basis points or more.

4.3.4 Impact of European Financial Market Integration on Bond Issuance Costs

In principle, a larger market will also bring efficiencies in terms of financial intermediation. This is because economies of scale can justify investments in more efficient trading technologies. Moreover, a larger market will attract more intermediaries to start operations there, enhancing the competitive pressures that may bring intermediation fees down.

At issue, therefore, is whether EMU and the introduction of the Euro have resulted in lower Euro-denominated corporate bond issuance costs for European non-financial companies.

A recent study by Santos and Tsatsaronis (2002) concludes that the arrival of the Euro has led to a reduction in the underwriting fees of corporate bonds issued in Euros[64].

They find that average gross fees (as a percentage of the amount raised) have fallen from 1.55% in 1994 to 0.43% in 2001 for issues in Euros while similar fees for issues in US$ have fallen from 1.30% to 0.59%. Thus, gross Euro issuance costs are now slightly lower than US$ issuance cost while the opposite was true in the mid-1990s.

According to the authors, this reduction is largely due to the greater contestability of the investment banking business in the post-EMU European market. The new currency made it easier for investment banks to benefit from scale economies in the provision of underwriting services, lowered the barriers to entry to this industry and made it easier for European borrowers to benefit from scope economies by combining their purchasing of commercial and investment banking services.

We will now examine whether a similar conclusion can be drawn from the information on gross issuance costs available in the databank used for the

[64] The study by Santos and Tsatsaronis is based on an analysis of 3110 international bond issues over the period 1994-2001. The data are taken from the IFR Platinum bond database compiled by Thomson Financial Securities.

estimation of the impact of European financial market integration on credit spreads.

In general, one observes that gross issuance fees have **d**eclined sharply in the late 1990s and this trend continued in 2000 and 2001 (Table 4.11). This is true for all issues as well as for issues in Euros by European companies and in US$ by U.S. companies.

A second interesting fact is the sharper decline in gross issuance costs faced by European non-financial companies issuing Euro bonds than in the issuance costs faced by their U.S. counterparts issuing international bonds in US$.

The third observation is that the fall in issuance costs is more pronounced for non-financial European corporations than for European financial sector corporations.

Finally, the difference between the issuing costs of European and US companies is much more pronounced for non-financial companies than for financial sector companies.

Table 4.11: Gross Issuance Fees 1991 – 2001
(As a percentage of amount issued)

Year	Average of all issuers in all currencies	Issues by European companies in Euro		Issues by U.S. companies in US$	
		Non-financial companies	Financial sector companies	Non-financial companies	Financial sector companies
1991	1.28	1.30	n.a.	1.65	1.23
1992	1.28	1.07	1.53	1.77	1.48
1993	1.37	2.00	1.77	1.94	1.12
1994	1.43	2.00	1.39	1.61	1.21
1995	1.60	2.00	1.52	1.56	1.27
1996	1.54	1.92	1.73	1.60	1.22
1997	1.48	2.00	1.77	1.88	1.47
1998	1.26	1.24	1.29	1.90	1.01
1999	1.01	0.87	1.01	2.31	0.96
2000	0.85	0.73	0.86	1.47	0.79
2001	0.67	0.53	0.63	0.83	0.58

Source: London Economics' estimates on Gabbi and Sironi data.

Our analysis suggests that Euro gross issuance costs are by now broadly similar to, or slightly lower than, US$ issuance costs. This suggests that, even if European financial market integration deepens, there is probably little scope for further significant decreases in issuance costs.

Therefore, in our simulation scenarios of the macro-economic impact of financial market integration, we will assume that issuance costs will not fall further with deeper integration.

4.3.5 Impact of European Financial Market Integration on Secondary Market Trading Costs

Background

The detailed discussion of secondary market trading costs in relation to equity markets in Section 3 of this report highlighted that the major determinant of the bid-ask spread in the secondary market is the depth of the market for that particular issue, which itself is a function of the size of the issue, the average volume of trade on the issue, as well as that in similar issues.

Additionally, the level of competition among financial intermediaries, in particular among dealers and market makers trading, will also have an impact on the average bid-ask spreads charged. Given the mostly over-the-counter nature of the secondary bond market, it is generally believed that significant price discrimination takes place in terms of bid-ask spreads. Market makers will offer smaller spreads to traders and investors with whom they have a long-standing relationship and a history of high volumes of trade.

As was already noted, secondary European corporate bond markets are still thin and not very transparent, and only few data are available.

We will therefore start our analysis with a review of recent key findings for U.S. markets. We will then briefly analyse the limited set of publicly available data on secondary trading costs of European corporate bonds[65]. Finally, we will discuss how deeper financial market integration may affect secondary trading in the future and the impact it may have on the cost of debt capital.

Results from recent studies

The Chen and Wei study – secondary market liquidity and corporate bond yields

Chen and Wei (2001) investigate how liquidity (or illiquidity) affects corporate bond yields. Their study focuses on the US corporate bond market and covers 700 corporations over the 10-year period 1990-1999.

Bonds with a smaller outstanding amount tend to be associated with lower rating quality, and exhibit a higher spread over riskless bonds. Thus, the

[65] A number of recent papers (Jankowitsch and al. (2002) and Houweling and al. (2002)) focus on the impact of security specific liquidity on the price of EMU government bonds Euro-denominated corporate bonds. But, so far no study has examined the impact of European bond market liquidity as the market is next to impossible to define.

impact of credit risk and illiquidity are intertwined. It is important to know how each component contributes to the overall spread. This knowledge is particularly important in analysing the impact of financial integration on a particular bond's spread, because financial integration is likely to have a large impact on liquidity but a small and undetermined impact on credit quality.

In Chen and Wei's study of the US corporate bond market, the authors fit the following regression:

$$y_i = c_0 + c_1 x_{1i} + c_2 x_{2i} + \varepsilon_i$$

Where y_i is the total yield spread (the difference between the bond's yield to maturity and that of its risk free counterpart), x_{1i} represents the bond rating, x_{2i} is the trading frequency, and ε_i is an error term.

The resulting coefficient on trading frequency is negative and statistically significant and equal to –0.0053. Trading frequency is given in terms of the proportion of turnover over outstanding value. If this proportion is 1, this is a very liquid issue, while if it is zero this would be an issue that has not been traded at all in the given year. The bond-specific liquidity can thus explain up to 53 basis points of the yield spread.

In the Chen and Wei's sample, the median trading proportion is 0.72 and the median yield spread is 1.59%. The regression predicts that if liquidity were highest, the yield would reduce to 1.44%. Thus illiquidity is responsible for a 15 basis-point higher median spread, or 9.4% of the total spread.

For the European market, where the current level of liquidity is likely to be much lower than that in the US, the weight of illiquidity on the median spread would probably be much higher.

Their final estimate for the median roundtrip trading costs for a sample of US corporate bonds in the years 1990-1999 is 0.59%. However, when only the more liquid half of the data sample is considered, this estimate becomes 0.23%. This illustrates the significant impact that liquidity is likely to have on trading costs.

The Chakravarty and Sarkar study – secondary market yield and corporate bond trading costs

Chakravarty and Sarkar (1999) also found that liquidity is an important determinant of the bid-ask spread in the US corporate bond market. Their study is based on a sample of bond dealer markets transactions data for the years 1995-1997. They proceed to estimate by GMM the following specification:

$$S_t = a_0 + a_1 M_t + a_2 A_t + a_3 BV_t + dummies + \varepsilon_t$$

Where S_t is the daily bid-ask spread for the bond, M_t is the time-to-maturity for the bond measured in years (a higher value is likely to increase volatility and therefore spreads), A_t is the age of the bond, or the time measured in years between the transaction date and the bond issue date, BV_t is the logarithm of the daily value of the purchases for the bond. The additional dummy variables that could be included in the regression should control for other factors that may affect bid-ask spreads, such as other bond-specific and market-specific characteristics.

The main resulting estimate of interest to the present work is that the estimated coefficient on the transaction volume variable is -0.07, which implies that an additional $1 million of bond purchases in the secondary market decreases the bid-ask spread by 7 cents.

A European study on the impact of liquidity on the pricing of euro-denominated corporate bonds.

A recent study by Houweling and others (2002) examined the impact of bond-specific liquidity measures on bond yields of euro-denominated corporate bonds. The liquidity measures used by the authors of the study are the issued amount, the age of the issue, the number of dealer quotes and the dispersion of dealer quotes. They find that the yield premium between liquid and illiquid bonds ranges from 0.2 to 47 basis points depending on which liquidity indicator is used.

What can be learned from available data?

To investigate the impact of total market size, as opposed to issue size, on trading costs, the following equation[66] has been estimated cross-sectionally:

$$Spread_{t,j,i} = a_0 + a_1 * \text{Size of bond issue}_{t,j,i} + a_2 * \text{Size of market}_{t,i} + \sum a_n * Dummies_n$$

Where $Spread_{t,j,i}$ is the average monthly spread[67] on bond j listed on stock exchange i in month t, Size of $issue_{t,j,i}$ is the average monthly amount outstanding of bond j listed on stock exchange i in month t, Size of $market_{t,i}$ = average monthly aggregate amount outstanding of all the bonds listed on stock exchange i in month t.

The bid-ask spreads for a number of financial and non-financial corporate bonds listed on five stock exchanges (EBS (Switzerland), Euronext-Amsterdam, Euronext-Paris, Frankfurt and Vienna) were retrieved from the

[66] Due to data limitations, it is not possible to estimate for bonds a trading costs model that is as rich in details and information as the one that is reported in Section 3 for equities.

[67] The spread is defined as (ask price-bid price)/effective transaction price.

Bloomberg information system[68] for the period of January 1999 to December 2001.

The dummies that are used in the model are fixed-year effects, fixed-industry effects and fixed stock exchange effects. Both the "Size of the issue" and "Size of the Market" variables were entered in log form in the equation whose estimation results are reported in Table 4.12.

A priori, on the basis of the U.S. results one expects that the variable "Size of the issue" to have a negative coefficient in the equation provided that the volume outstanding is a good proxy for actual secondary market liquidity of the bond. If the correlation between the volume outstanding and the volume actually traded is weak, it is possible that the opposite result can be obtained with bonds from larger issues being more difficult to trade in secondary markets as investors are already fully loaded up in such bonds.

A negative coefficient is expected for the "Size of the market" variable as a broader market with many listed and traded issues should generally be more liquid as they reduce trading and holding risks for market makers and other providers of immediacy.

The estimation results reported in **Table 4.12** show that the fixed effects variables are generally statistically significant and that the coefficient of the "Size of the issue" variable is statistically significant, but positive.

In contrast, the coefficient of the "size of the market variable" is negative (as expected), but not statistically significant, providing no solid evidence that market size matters. We would, however, advise against putting much emphasis on these empirical results as they are based on a small sample of stock exchanges and abstract from the much more important, and probably more representative, OTC corporate bonds trade.[69]

[68] These are the only bonds in Europe for which bid-ask prices are available on the Bloomberg information system.

[69] Unfortunately, no detailed data on secondary market corporate bond trades are available.

Table 4.12: Empirical Model of Bond Trading Spreads

Dependent variable = Quoted Percentage Spread[70]		
Explanatory variables	Estimated coefficient (t-statistic in parenthesis)	
	Model 1	Model 2
Constant[1]	-0.32 (0.69)	-0.33 (0.71)
Size of issue	0.04 (8.59)	0.04 (6.93)
Size of market	-0.01 (0.57)	-0.01 (0.46)
Stock Exchange Dummies[1]		
EBS (SWISS) (60 issues traded in 2001)	0.16 (4.97)	0.16 (4.73)
EURONEXT-AMSTERDAM (156 issues in 2001)	0.12 (2.07)	0.11 (1.89)
EURONEXT-PARIS (144 issues in 2001)	0.14 (2.20)	0.14 (2.27)
FRANKFURT (120 issues in 2001)	0.02 (0.33)	0.02 (0.30)
Year Dummies[1]		
2000	0.04 (3.42)	0.04 (3.46)
2001	0.05 (3.10)	0.05 (3.24)
Industry Dummies[1]		
Basic Materials	--	0.02 (1.00)
Communications	--	0.02 (1.30)
Consumer, Cyclical	--	-0.03 (1.46)
Consumer, Non-cyclical	--	0.01 (0.39)
Diversified	--	0.06 (3.14)
Energy	--	0.02 (0.88)
Industrial	--	-0.05 (3.45)
Summary statistics		
Number of observations	1275	1275
Adj. R-squared	0.2156	0.2495
Root MSE	0.13	0.13

(1) To avoid perfect multi-collinearity the Vienna stock exchange dummy has been dropped (27 issues traded in 2001), the 1999 year dummy is omitted and the utilities dummy is omitted from the industry dummies. The constant term should be interpreted, therefore, as the constant applicable for the Vienna stock exchange in 1999 for the utilities sector.

Source: London Economics' estimates on Gabbi and Sironi data.

[70] Defined as (ask price-bid price)/effective transaction price.

Potential Impact of European Financial Market Integration

As discussed above, we have found no evidence that trading spreads of European bonds are significantly affected by regional fragmentation of market liquidity.

This may simply reflect the fact that so far relatively little active secondary trading in European corporate bonds is taking place[71]. Deeper financial market integration, the lifting of any restrictions on cross-border holdings of corporate bonds and a more mature primary bond market may result in a more active secondary market. Top rated corporate bonds may replace sovereign bonds in investors' portfolios if prudent fiscal policies continues to be pursued and public debt continues its downward trend. Deeper and more diversified corporate bond markets may also induce investors to manage more actively their bond portfolios.

While a deeper and more liquid secondary market would likely result in somewhat lower trading costs, so far there is little hard evidence to support this hypothesis. Therefore, in our macroeconomic simulations of the impact of deeper financial market integration we will assume that bond-trading costs remain broadly unchanged.

[71] It would appear, however, that a very small number of corporate bonds are more actively traded.

4.4 Conclusions

In this section, we have examined how European financial market integration may lower the cost of market debt for non-financial corporations. In contrast to equity financing, we believe that the most pronounced impact of financial market integration will be felt on the primary bond markets. Financial market integration will result in a deeper and even more liquid market, and should lead to further reductions in the credit spread (or risk spread relative to a comparable risk-free security) required by investors.

We have found that the recent growth in the stock of Euro-denominated corporate bond issues by European non-financial corporations has resulted in a significant decrease in the credit spread as investors in Europe and elsewhere in the world have become more familiar with European non-financial corporate debt.

For example, our estimation results suggest that the rapid growth in the stock of Euro-denominated corporate bonds since January 1999 has reduced the credit spread by about 90 basis points.

In the macro-economic simulations of the effects of financial market integration, we assume that this effect continues and that it will reduce the costs of market debt by about 40 basis points for all non-financial European corporations alike.

We do not expect the risk-free rate to fall much further as a result of deeper financial market integration. Furthermore, as gross debt issuance costs have already fallen significantly to a level broadly similar to that prevailing in the United States, we will assume that gross issuance costs will not fall further with continued financial market integration.

Finally, as was highlighted earlier in this section, the secondary market for European corporate debt is still very much in its infancy. Trading volume is still relatively low and, presently, many investors prefer to hold their bonds to maturity. This will likely change in the future as the primary market grows and new, more transparent and more liquid, trading platforms develop. Our empirical analysis finds no support for the hypothesis that a larger market (in terms of overall liquidity) should significantly reduce trading costs. Nevertheless, it is not obvious that, at the present time, secondary market trading costs are taken into account by investors in their bond investment decisions as most bonds are typically held to maturity. Therefore, we do not believe it is appropriate to incorporate a trading cost decline in our simulations.

5 European Financial Integration – Survey of Financial Market Participants

In this section we present the main results of our survey of European financial market participants. The survey was developed by London Economics and undertaken by PricewaterhouseCoopers' International Survey Unit in May 2002. A copy of the questionnaire used for the survey and all tabulated answers are contained in the annexes to this report.

5.1 Background to Survey

The objective of the survey of European financial market participants was to identify the views of a range of market players in relation to the likely magnitude of financial integration impacts. Specifically, the survey examined the views of market participants in relation to the following aspects of financial integration:

- Views on whether, and to what extent, full integration of European financial markets would lower trading costs (by type of cost);
- Views on whether, and to what extent, equity financing costs are likely to fall as a result of full integration of European financial markets
- Views on whether, and to what extent, bond financing costs are likely to fall as a result of full integration of European financial markets
- Views on the importance of predicted benefits to consumers and investors of full integration of European financial markets;
- Views on the likelihood of different types of benefits occurring as a result of full integration of European financial markets

The survey covered a sample of 203 market participants across six European countries, France, Italy, Spain, Portugal, the UK, and the Netherlands. The sample captures a broad range of market types reflecting different size and institutional characteristics. It includes institutional investors; stockbrokers; market makers; stock exchange employees and alternative trading systems operators.

5.2 Analysis of Survey Findings

In presenting the survey findings, it is useful to divide the analysis into the following areas:

- Financial integration and trading costs;
- Financial integration and equity financing costs;
- Financial integration and bond financing costs;
- Potential benefits of integration to consumers and markets.

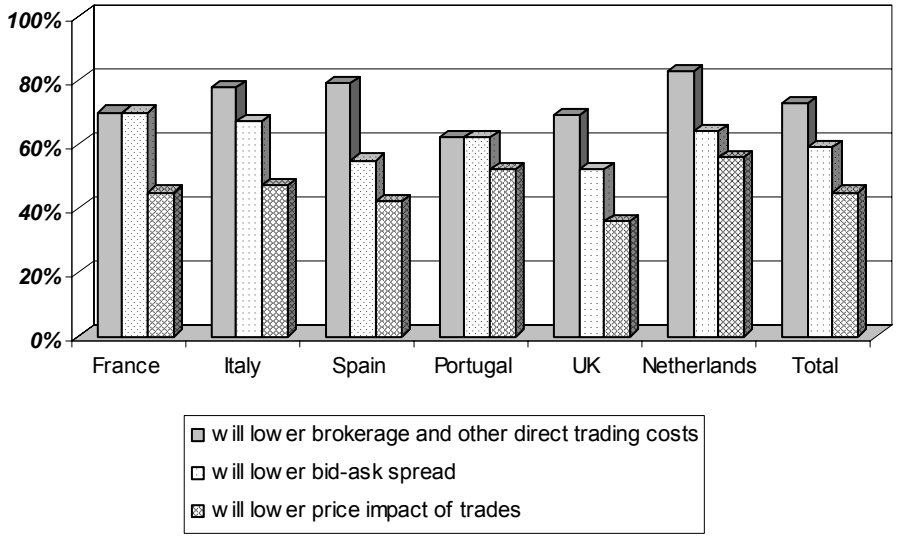
5.2.1 Financial integration and trading costs

The first two survey questions sought participants' views on whether, and to what extent, full European financial market integration would lower several types of trading costs. Figure 5.1 and Figure 5.2 present the results. Respondents were asked specifically about three elements of trading costs:

- Brokerage commissions and other direct/explicit trading costs
- Bid-ask spread
- Adverse price impacts[72]

[72] Typically buying orders cause the security price to increase and selling orders cause it to decrease. These are adverse price movements that can be larger or smaller depending on a number of characteristics of the market.

Figure 5.1: Views on Impact of European Financial Market Integration - Percentage of Total in Agreement With Each Statement



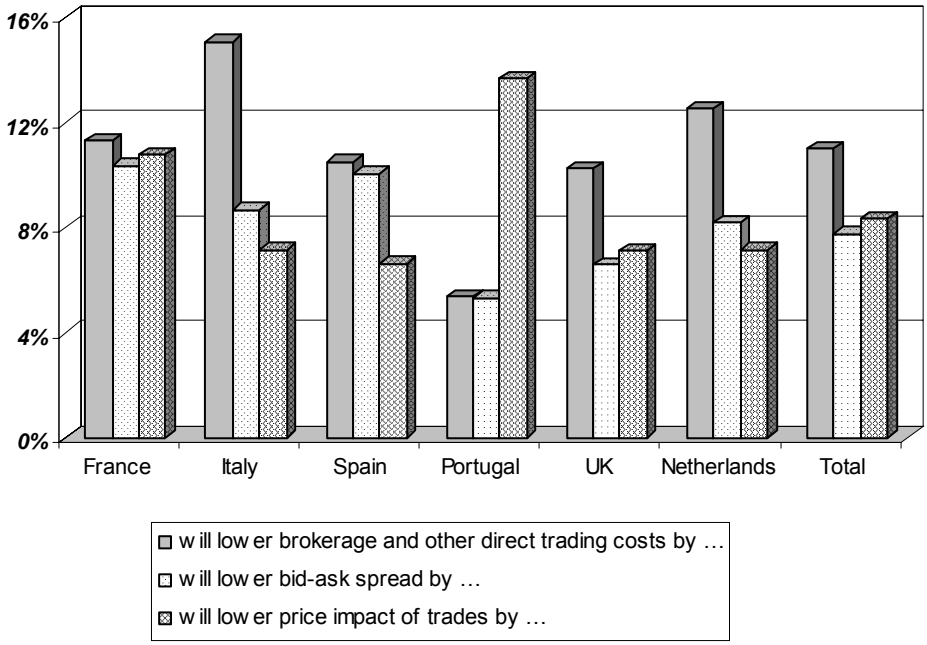
Source: London Economics' elaborations on LE-PwC survey.

We found very similar views on these issues across the countries in our sample. Overall, 73% of interviewees expected full integration of European financial markets to result in lower brokerage commissions and other direct/explicit transactions costs; 59% believed that it would lower bid-ask spreads and 45% that it would decrease the price impact of trades.

Respondents were asked to estimate by how much these different costs could be expected to decrease. We have estimated an "expected decrease" per country by taking a weighted average: the midpoint of each of the ranges of cost reductions specified times the percentage of respondents that chose that range. Figure 5.2 below presents the results of this calculation.

Overall, our sample of European financial markets operators expect brokerage and other direct costs to go down by 11%, and the price impact of trades and bid-ask spread by 8%. We may also note that in France, Italy and Spain, market participants seem to be more optimistic than in the UK, Portugal and the Netherlands about the likely magnitude of these effects.

Figure 5.2: Views on Impact of European Financial Market Integration -



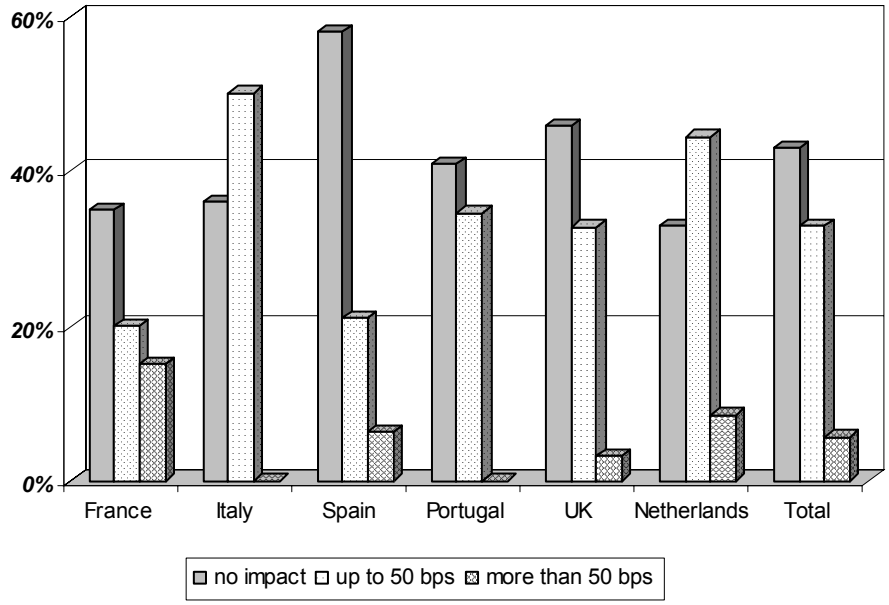
Source: London Economics'elaborations on LE-PwC survey.

5.2.2 Financial integration and equity financing costs

The next two questions in our survey focused on the likely impact of financial market integration on equity financing costs, as measured by equity yields. Figure 5.3 presents the results. Overall, 43% of respondents reported that they expected no impact of financial market integration on equity financing costs. 33% however believed that the impact could be a decline between 0 and 50 basis points and 6% expected that decline to be higher than 50 basis points.

Respondents from Italy and the Netherlands were relatively more optimistic than the average of those interviewed across the 6 countries. Spain reveals the largest proportion of financial market participants, 58%, who expect to see no decrease in equity financing costs following full financial integration.

Figure 5.3: Views on Impact of European Financial Market Integration - Impact on Equity Financing Costs - Percent of Total Respondents



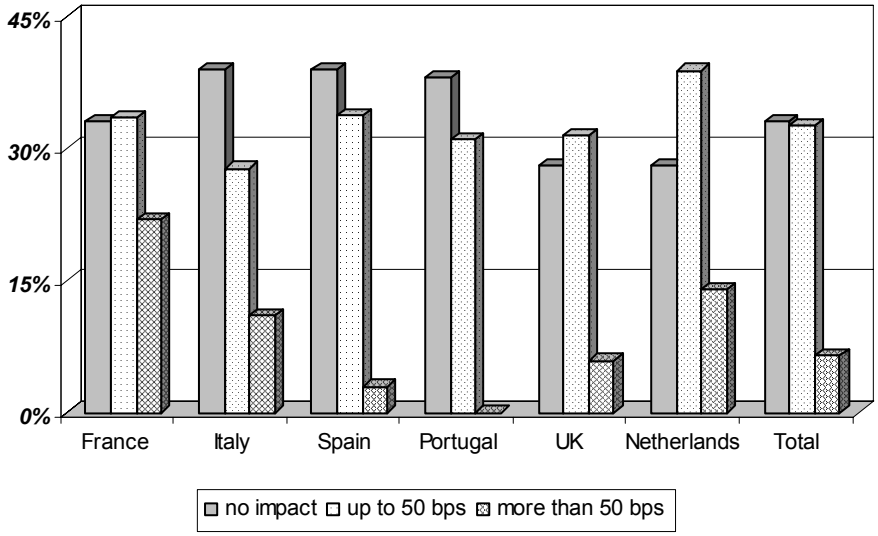
Source: London Economics'elaborations on LE-PwC survey.

5.2.3 Financial integration and bond financing costs

Figure 5.4 below indicates the views of market participants on whether and to what extent bond financing costs – measured by bond yields - would fall following full integration of financial markets in Europe. In this case, only 33% of market participants interviewed stated that bond yields would not be likely to decrease following integration. It is notable, however, that 21% of those surveyed did not express a view on this issue. Of total respondents, 33% believed the decrease would be below 50 basis points and 6% that it would be larger than 50 basis points.

Interviewees in the Netherlands and France expected relatively larger gains from integration for the cost of bond financing than those in Italy, Spain, Portugal and the UK.

Figure 5.4: Views on Impact of European Financial Market Integration - Impact on Bond Financing Costs - Percent of Total Respondents



Source: London Economics'elaborations on LE-PwC survey.

5.2.4 Potential benefits of integration to consumers and markets

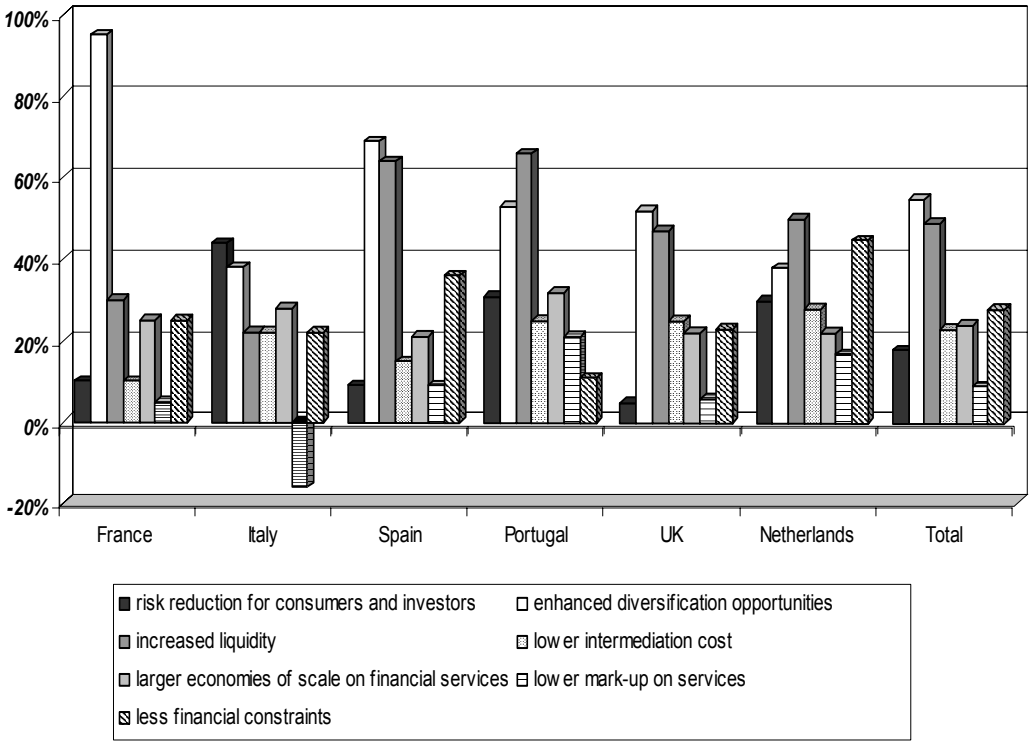
In this section we report on the views of financial market participants of the potential benefits that could accrue to consumers and investors, and in terms of the functioning of markets, following full integration of European financial markets.

Respondents were asked to rate, on a scale of 1 to 5, the importance of the following possible gains from integration:

- Risk reduction for consumers and investors
- Enhanced opportunities for diversification/portfolio choices
- Increased liquidity
- Lower cost of intermediation
- Higher economies of scale/scope for financial services
- Lower mark-up on services
- Fewer financial constraints.

In Figure 5.5 we present the views of market participants on the relative importance of potential benefits. We show for each country and each topic the difference between those who considered it "quite important" or "very important" and those who considered it "not at all important" or "not really important". We call this the "balance of opinions".

Figure 5.5: Views on impact of European financial market integration - Balance of opinions: difference "quite important" and "very important" minus "not at all important" and "not really important"



Source: London Economics' elaborations on LE-PwC survey.

The benefits considered the most important by the respondents are the enhanced diversification opportunities and the increased liquidity. On the other hand the possibility of lower mark-ups and risk reduction for investors are considered relatively less important.

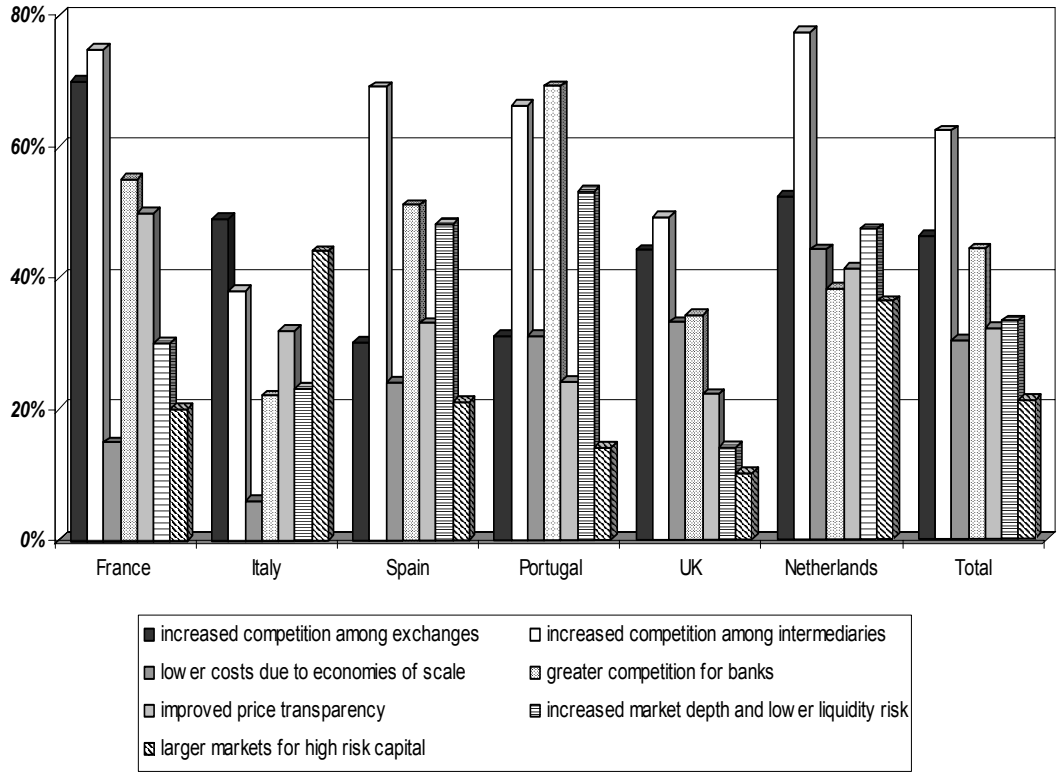
In Spain, Portugal and the UK, increased liquidity and enhanced diversification benefits are considered the most important benefits from financial integration. Enhanced risk diversification receives the most attention from interviewees in France with a positive balance of opinion of 95%. Italy stands out as the only country where risk reduction is considered the most important benefit from integration and where an eventual reduction of mark-ups on services is considered relatively unimportant.

We next turn to the issue of the benefits accruing from integration in terms of the functioning of financial markets. Our survey of market participants asked interviewees to give their views on the likelihood of financial integration resulting in a variety of market operational benefits:

- Increased competition among exchanges
- Increased competition among financial intermediaries
- Lower costs due to economies of scale
- Greater competition for banks and other more traditional sources of corporate finance
- Improved price transparency
- Increased market depth and lower liquidity risk
- Larger markets for high risk capital.

Respondents were asked to rate likelihood of each of these benefits on a scale of 1 to 5. As in the previous case we have constructed a "balance of opinions" index, which computes the difference between those who considered it "quite likely" or "very likely" and those who considered it "not at all likely" or "not really likely". We present the results in Figure 5.6.

Figure 5.6: Views on Impact of European Financial Market Integration - Balance of Opinions: Difference "Quite Likely" and "Very Likely" Minus "Not At All Likely" and "Not Really Likely"



Source: London Economics' elaborations on LE-PwC survey.

The impacts that are considered most likely by the interviewees are increased competition among financial intermediaries and exchanges and greater competition facing banks and other more traditional sources of corporate finance. Relatively less likely, according to the respondents, are decreases in trading costs due to economies of scale and the appearance of larger markets for high risk capital.

Respondents from France, Spain, Portugal and the Netherlands are relatively more optimistic on the likelihood that financial integration will contribute to increased competition among intermediaries. Respondents from Italy and the UK lag behind the others in overall optimism regarding the likelihood of any of the considered benefits from integration.

5.3 Conclusions

In this section we presented the findings from the PwC/London Economics' survey of European financial market participants, which surveyed the views of a range of market players in relation to the likely magnitude of financial integration impacts. It is useful to summarise the main conclusions from the survey, as follows:

- 73% of participants surveyed were of the view that integration of financial markets would result in lower brokerage commissions and other direct/explicit transactions costs. 59% stated that they expected bid-ask spreads would decrease following integration, and 45% of that they would expect price impact of transactions to decrease.

- The expected magnitudes of these impacts were 11% in terms of lower brokerage fees and other direct trading costs, and 8% in terms of lower bid-ask spread and lower price impact of trades.

- 47% of interviewees across the six countries were of the view that equity yields would decrease as a result of full integration of markets. Of these, 70% were of the view that equity yields could decrease by up to 50 basis points and 10% by between 51-100 basis points. This implies that of all respondents 33% expect the decrease to be between 0 and 50 basis points and 6% above 50 basis points.

- 46% of market participants were of the view that bond financing costs would fall following full integration of markets. Of these, 71% expected that bond yields could fall by up to 50 basis points, and 14% by between 51-100 basis points. This implies that, of all respondents 33% expect the decrease to be between 0 and 50 basis points and 6% above 50 basis points.

- Among the important benefits of market integration cited by market participants are enhanced opportunities for diversification/portfolio choice and increased liquidity.

- Among the more likely benefits of market integration cited by market participants are increased competition among exchanges and financial intermediaries and greater competition facing banks and other more traditional sources of corporate finance.

6 Macroeconomic Impact of European Financial Market Integration

6.1 Introduction

In this section we assess the economic impact of the changes in the costs of equity and bond financing that, in Sections 3 and 4, we estimated would result from full European financial market integration.

The reduction in the cost of equity and bond financing reduces the cost of capital (in real terms) and, hence, stimulates investment and raises the stock of productive capital. As a result GDP and standards of living increase.

This section is structured as follows. We first describe briefly our model, focusing in particular on the investment equations used in the model. Next, we describe the various simulation scenarios. Finally, we present the simulation results.

6.2 The Global Macroeconomic Model

6.2.1 Overview of the Model

The model we use in this study to estimate the macro-economic impacts of integration of European financial markets is the Oxford Economic Forecasting global system of interlinked macroeconomic country models covering all the major economies – some 40 economies are treated in considerable detail (including all the EU economies) and many more in simplified form (10-20 equation models versus 100-300 equations for the detailed countries).

The total for world trade is completed by the treatment of the remaining countries as blocks and there are also definitions for world prices and the global energy market.

Its structure is very typical of mainstream econometric models (detailing GDP and its demand components, the supply side, the labour market and prices, financial variables and key country inter-linkages) and it broadly reproduces the type of behaviour patterns that have become more or less accepted features of the OECD economies and, indeed, of the global economy.

The individual country models of the system are very similar in specification but maintain important key differences, largely through varying parameter values in the functional forms.

It is widely acknowledged that structural differences (in terms of trade links, sectoral production structure, employment structure, tax systems etc.) among European economies largely explain the observed variations in model results

across countries (and these are reflected in actual outcomes for the economies as well).

Many other country models (for example those maintained by national governments and international institutions) have been operating now for 20-30 years and there has been a considerable build-up of expertise over this time frame, and we draw on this expertise in judging the acceptability of the model.

The model's system was first set up 20 years ago, in the early 1980s, although there has been extensive re-estimation as well as additions to the global system since then (e.g. the incorporation of key emerging market economies such as Mexico, China and Korea but also the major EU candidates as well as Russia and Turkey).

Whilst history, model comparisons and staff expertise lend credibility to the system, we are also aware of the limitations of models, especially where the macro model approach adopts convenient simplifying assumptions, which may be acceptable for most purposes but appear to limit the immediate use of the model for certain studies.

Frequently, simplifications need to be reconsidered, and modified or enhanced in specific case studies. Indeed, in the particular work undertaken here we need to implement a more refined approach to the definition of the cost of capital (as described below) in contrast to the typical macro model simplification (i.e. using an interest rate proxy for the cost of capital).

There is also scope to make use of 'off-model' studies to confirm or reconsider certain key functions and their implications for economic results. In this study, we rely on the results of a number of recent studies on the behaviour of European investment and the impact of the cost of capital[73].

The studies suggest that investment functions are broadly similar for all the major EU economies and that is investment in the UK and US is not more sensitive to the cost of capital than in the major Eurozone countries.

Some studies indicate that Eurozone business investment could be more sensitive to the cost of capital than the UK. For example, the Whitley and Britton (1997) study reports a unitary elasticity of domestic demand with respect to real interest rates for the UK but as high as 1.2-1.4 for France and Germany. It also suggests that this elasticity is possibly higher for business investment alone.

6.2.2 The Cost Of Capital and its Impact On Investment

Along with most mainstream macroeconomic models, our model uses interest rates as a proxy for the user cost of capital (UCC), typically taking an

[73] For example, Chatelain and al. (2001), Gaiotti and al. (2001), Generale and al (2001) and von Kalkreuth (2001) and Whitley and Britton (1997).

average of the two key rates in the system, the 3 month short-term rate and the 10-year government bond yield (or closest available).

In the standard model, the real UCC (RUCC) is used in the calculation of a Tobin 'Q' style investment ratio (QR=relative return on capital employed versus risk-free short-term market interest rates). The QR variable then determines long-run business investment trends (or total investment for small countries for which a breakdown of investment is not available).

The short-term behaviour of the investment function is largely an accelerator mechanism, linked to GDP fluctuations[74]. However, the short-term dynamics are less important for the purpose of this study than the medium- to long-run results. We will therefore focus the discussion on this aspect of the model.

Specific test versions of the model (used for studies of the US cost of capital and its impact) have already introduced a more elaborate model to calculate the UCC, taking into account a weighting of the costs of short-term financing (bank lending including a corporate premium), bond financing (also allowing for a corporate risk premium) and stock market financing (including the costs of dividend pay-outs and other associated expenses of market listings, such as stock exchange fees etc).

Theoretically, at least in the long run, financial market arbitrage is supposed to reduce if not eliminate differences across financing methods (althou**u**gh still allowing for the possible persistence of risk premia based on investor preferences and different tax treatment of the various sources of corporate finance). In addition, because investment and the UCC are viewed on a long-term basis, short-term fluctuations in the UCC should have very little influence on investment decisions. Nevertheless, in practice, investment decisions may be well influenced in the short term by fluctuations in the UCC and arbitrage may be imperfect.

For example, imperfections may be due to issues relating to the functioning of capital markets, liquidity and market depth and these factors may be persistent. Short-term cash-flow considerations may also play a part in the observed impacts on companies and a number of studies have tried to examine some of these factors[75]). Detailed studies indeed suggest that the overall impact of changes in financial conditions, which may be proxied by real interest rates, could be larger than many macro model estimates might imply.

Apart from wedges due to imperfect market operations, the UCC for different countries will also be affected by regional investor preferences and regulations governing the percentage of investment that must be held

[74] GDP growth may be seen as a demand stimulant, a capacity shortage indicator and/or a profit indicator – all of these variables exhibit correlated cycles.

[75] For example , see Whitley and Britton (1997), Chatelain and al. (2001), Gaiotti and al. (2001), Generale and al (2001) and von Kalkreuth and al. (2001).

domestically versus abroad or in equities versus other instruments (e.g. pension fund regulations).

Whilst these factors may play a role in the markets, we will not attempt to treat such issues here. This Section will focus on assessing the impact of specified changes in the main components of the UCC on EU investment and GDP.

6.2.3 The User Cost of Capital and Investment in the Simulations of European Financial Market Integration

The user cost of capital

In the simulations, we utilise an enhanced (and harmonised) definition of the UCC that separately identifies the main components of external finance, as described below.

Total financing costs is equal to the sum of 1) equity finance, 2) bond finance and 3) bank lending and other interest-sensitive financing sources such as trade finance, etc.

Therefore, the nominal user cost of capital (UCC) is equal to the average nominal cost of finance in model or the weighted sum of the cost of bank lending[76], bond finance and equity finance (see Equation 6.1).

Equation 6.1: UCC = UCCW1*(PCORP1) + UCCW2*(PCORP2) +UCCW3*(PCORP3)

where:

PCORP1= bank lending rate to the corporate sector

PCORP2= corporate bond rate

PCORP3= cost of equity finance

UCCW1, 2 and 3 are the respective weights for each type of finance. By construction, their sum is equal to 1.

In theory, one should define the real user cost of capital in full, taking account of differential tax rates and relative prices and, possibly, short-term liquidity constraints etc).

However, in the simulation scenarios described below, the only changes to the user cost of capital arise from changes in financing costs. Therefore, it is

[76] It is implicitly assumed that the interest rates on all interest-sensitive sources of corporate finance other than bond finance will move broadly in line with the cost of bank finance. Thus, in the macroeconomic simulations, the interest rate on bank loans is representative of all non-bond interest-sensitive sources of funds.

possible to use a simplified definition, given by equation 6.2, of the real user cost of capital (RUCC) that explicitly assumes that all other variables (taxes, etc) affecting the RUCC remain constant.

Equation 6.2: RUCC = UCC – inflation + the economic depreciation rate

Our models typically use this RUCC in defining an investment ratio (the real rate of return on investment versus the risk free rate), which is then, in turn, used to drive the business investment function.

However, in the models used for simulating the impact of European financial market integration the newly defined RUCC variable is introduced directly into the business investment equations[77].

The use of the RUCC as the real user cost of capital implies that all three forms of finance are perfect substitutes in terms of the *real investment* decision.

Business investment and the user cost of capital in the simulations

The real user cost of capital (RUCC) drives real business investment (IPNR) through the relationship given by equation 6.3.

Equation 6.3: IPNR = f (Y, K(-1), RUCC)

Where,

Y=real GDP, and

K=capital stock.

An investment equation of the form given by equation 6.3 is typically derived from the underlying production function, as described in many standard macroeconomic textbooks.

Assuming that firms optimise their use of resources, the marginal product of capital (dY/dK) will be equal to the real user cost of capital. That is,

Equation 6.4: dY/dK = RUCC

The marginal product of capital (dY/dK) is given by equation 6.6 if the underlying production function is a simple Cobb-Douglas production function such as shown in equation 6.5.

[77] This approach yields an investment equation that is comparable to those used in many other studies which, typically, utilise the real user cost of capital and not an investment ratio concept.

Equation 6.5: $Y = AL^{a}K^{(1-a)}$

Equation 6.6: $dY/dK = (1-a)*Y/K$

Combining (6.6) with (6.4) shows that, in equilibrium and provided firms are optimising, the real user cost of capital is equal to the capital productivity (Y/K) times the labour income share a,

Equation 6.7: $RUCC = (1-a)*Y/K$

It is then possible to solve equation (6.7) for the equilibrium or long-run optimal level of the capital stock KSTAR. In other words, KSTAR can be defined as:

Equation 6.8: $KSTAR = ((1-a)/RUCC)*Y$

This is the same form as the optimal capital stock equation (6.9) used in numerous studies.

Equation 6.9: $Ln(KSTAR) = Ln(1-a) - b*Ln(RUCC) + c*Ln(Y)$

In a Cobb-Douglas (CD) production function, the parameters b and c are by definition equal to 1. In such a case, the usual approach is to derive an investment equation of the form given by equation 6.10.

Equation 6.10: $(IPNR/K(-1)) = const + x*Ln(RUCC) + y*Ln(Y) +$ other terms and lags

However, this is not the most convenient formulation for use in a macroeconomic model as its functional form may cause excessive volatility in the short-term solutions and, more importantly, the equation parameters (such as x, the parameter of the term Log(RRUC)) cannot be immediately interpreted as elasticities.

Thus, in the model, a modified form of this equation has been adopted, implementing a log linear function for equation 6.3 that can be derived in a number of ways. For example, from equation 6.8, we can derive an adjustment equation for K to KSTAR and derive IPNR from this adjustment equation.

The model technically already defines the short-term change in the actual capital stock as investment less the economic depreciation rate (depr). That is,

Equation 6.11: $K = (1 - depr)*K(-1) + IPNR$

But, we may also assume

Equation 6.12: K = (1-depr)*K(-1) + f(KSTAR, K(-1), other terms...)

Or,

Equation 6.13: (K - (1-depr)*K(-1)) = f[(((1-a)/RUCC)Y), K(-1), other terms…]

Therefore, after substituting IPNR into equation 6.12, the following investment equation is obtained:

Equation 6.14: IPNR = f(RUCC, Y, K(-1), other terms….)

In other words, equation 6.13 is similar to equation 6.3. Alternatively, one can also derive IPNR directly from equation 6.9. Suppose that investment is equal to the capital formation required to achieve the desired capital stock level. Or,

Equation 6.15: IPNR = KSTAR – (1-depr)*K(-1)

Therefore, substituting equation 6.8 into equation 6.14, the following investment equation can be obtained,

Equation 6.16: IPNR = ((1-a)/RUCC)*Y – (1-depr)*K(-1)

To simplify, if one assumes that, in the short term, output is proportional to the capital stock in place, i.e. that,

Equation 6.17: Y=gK(-1)

Then,

Equation 6.18: IPNR = ((1-a)/RUCC)*g(K(-1)) – (1-depr)*K(-1)

Equation 6.19: IPNR = (x/RUCC)*K(-1)

Equation 6.20: Ln(IPNR/K(-1)) = Ln(x) – Ln(RUCC)

Clearly, various convenient forms of the investment relationship can be derived, adopting some simplifying assumptions. Allowing for adjustment lags, the form of the equation implemented in the model is:

Equation 6.21: D(Ln(IPNR)) = constant + x*D(Ln(GDP)) + other lagged terms in {D(Ln(GDP)) and Ln(K(-1))} + y*(Ln(IPNR(-1)) + z*Ln(RUCC(-1))

Where y is the speed of adjustment to the long run equilibrium. As already noted, the key innovation introduced in the model[78] used to simulate the impact of financial market integration is the use of the new, expanded RUCC definition instead of the investment ratio derived from the real interest rate.

The most critical parameter for the purpose of this study is that of the RUCC term. In the equation above, the elasticity of business investment with respect to RUCC can be measured directly as the coefficient z, which, as shown before, should be equal unity on theoretical grounds if one assumes a long-run Cobb Douglas type production function.

We note that, according to equation (6.20), a 1% change in RUCC will cause a z% change in IPNR in the long run, ceteris paribus. This means that the impact of a given change in RUCC on IPNR will be affected by the size of RUCC.

For example, a *one percentage point* increase in RUCC represents a 10% change in RUCC if RUCC itself is 10% but a 100% rise in RUCC if RUCC is as low as 1%. In practice, we find that all countries have RUCCs tightly clustered in the 9-10% range.

From previous estimation work, and estimates from other models, it appears reasonable to assume a Cobb Douglas technology (i.e. that z=1) for the long-run model of the US, UK and many EU countries.

Older econometric estimates in the OEF model and similar macroeconomic models of the coefficient (z) on the RUCC term (or real interest rates as a proxy) in the long-run investment relationship were often lower than unity for some important countries, especially Germany, France and Italy, the three largest Eurozone economies. Prima facie this would suggest that the Cobb-Douglas technology may not represent very well the underlying economy-wide production function.

However, the recent studies cited earlier in this section suggest that the low parameter values found in some macro-economic business investment equations for Eurozone economies may underestimate the total impact of the cost of capital (or interest rates) on investment decisions. Certainly the elasticity is highly unlikely to be less than 0.5 and may even be larger than 1. One study indicated that a one-percentage point rise in interest rates could imply a 4% change in business investment in Germany.

Therefore, we believe that, on the basis of the most recent empirical work, it is reasonable to assume a unitary elasticity (i.e., a Cobb-Douglas production technology) even in the case of countries that in older studies did not exhibit such properties. In fact, recent estimates for the impact of the cost of capital may point to yet higher effects than we assume here.

In order to be able to simulate changes in the various components of the user costs of capital, we introduce the new concept of RUCC in the investment

[78] Relative to the standard OEF model.

equations used in the simulations reported in this study. We also assume that all the EU country investment equations are of the same form.

The elasticity of investment to the user costs of capital in the modified equations is essentially in-line with the existing equations for the US and UK – i.e., that it is unitary in the long run for all EU countries.

In the absence of any strong indications to the contrary, adopting homogenous investment equations for each of the countries in the EU is advantageous as it avoids a) introducing variations across countries that may not be well supported by econometric evidence and b) the need for disentangling the effect of changes in the components of the use cost of capital from structural differences in any cross-country comparison of the simulation results. That being said, the actual changes in the user cost of capital will vary across countries as the impact of financial market integration varies across countries

6.3 Background Details on Macroeconomic Simulations

As we have shown in Sections 3 and 4, deeper European financial market integration would reduce:

1. Equity trading costs and thus the cost of equity capital. We estimate that the costs of equity capital could fall by between 10 and 50 basis points across Europe (see Table 3.6 in Section 3). Moreover, improvements in the cross-border settlements system could shave another 10 basis point of the cost of new equity capital; and,

2. The credit spread on new issues of Euro-denominated corporate bonds and thus the cost of new bond finance. However, this reduction in the cost of new Euro denominated corporate bonds is dependent on a further increase in the overall value of outstanding Euro-denominated corporate bonds that, in turn, requires a shift away from bank finance towards corporate finance[79].

In Section 4, we have shown that, if European companies increased their stock of outstanding bonds by an amount sufficient to reduce by 25% the difference between the EU and US shares of bond finance in total debt finance, then the credit spread on new Euro-denominated corporate bonds could fall by 40 basis points.

[79] The underlying assumption is that only the composition of debt finance changes and that there is no overall change in the mix of equity and debt finance.

For the sake of completeness, we will furthermore also assume in one of the simulations that the cost of bank lending to companies will fall by 20 basis points as a result of competitive pressures from the debt market[80].

To quantify the macroeconomic impact of these changes in the cost of capital we run four simulations that each reduces the cost of capital by a successively larger amount. This sequential approach allows one to disentangle the effects of the various changes being simulated and, thus, assess the relative importance of each.

- The first simulation reduces the costs of equity finance only.
- The second simulation reduces the cost of equity finance and bond finance but keeps the share of bond finance unchanged
- The third simulation reduces the cost of equity and bond finance, and increases the share of bond finance.
- Finally, the fourth and last simulation adds a reduction in the cost of bank finance to the reduction in the cost of equity and bond finance and the increase in the share of bond finance.

The effects of each of these changes are assessed relative to 10-year baseline scenario that has been created using the modified model and detailed information on the three components of the user cost of capital described below.

Each of the changes in the user cost of capital is introduced gradually over a three-year period and the simulation was run over ten years.

It is important to note that, by construction, the model converges to equilibrium towards the end of a 10-year projection period[81]. In other words, at the end of the projection period, it is assumed that there is no excess

[80] We have used monthly data from the Federal Reserve Statistical Release (http://www.federalreserve.gov) to test the relationship between the cost of bank loans and the cost of bond finance in the US. We first performed Granger-causality tests to understand the direction of causality between "Bank loans to business" and "Average yield to maturity on selected long-term bonds of all private industries rated Aaa in Moody's rating". There is evidence that bank loans rate follow bond yields but there is no evidence of causality the other way around (from to bank loans rates to bond yields). We then estimated the following Granger causality equation (the model was estimated in first differences using three lags for bank loans rates and bond yields, but is remarkably robust to other lag specifications):

Bank loans rate = CONST + 1.24 Bond yields

According to the above equation, a 40 basis point decrease in bond yields will lead to a decrease of 49.6 basis points in the bank finance rate. In our macroeconomic simulations we prefer to err on the conservative side and therefore assume that the cost of bank finance would fall of only 20 basis points following a reduction of the cost of bond finance of 40 basis points.

[81] This equilibrium condition arises from terminal conditions imposed exogenously by the model-builders in the models.

physical productive capacity that could be used without generating inflationary pressures and the unemployment rate is at Nairu.

In order to generate the baseline scenario and simulate the changes in the user cost of capital, detailed information on the shares of different types of corporate finance and the cost of equity, bond and bank finance is required. This information is reviewed below.

Shares of bank, bond and equity finance

A major challenge is preparing the simulations of the impact of changes in the cost of various sources of external corporate finance is that, at the present time, there exist no comprehensive data sources that would provide the necessary information for all EU countries in a consistent manner.

The early literature on the nature of corporate finance in Europe aimed to test the hypothesis that companies in capital market-dominated financial systems will use less bank loans as compared to equity in order to finance their business than companies in bank dominated systems. Such studies (Rutterford 1988, Berglöf 1990, Borio 1990) indeed found evidence for this view in cross-country comparisons of corporate capital structure. However, subsequent studies (Mayer 1990, Edwards and Fischer 1994), employing a flow of funds approach found very little differences in the financing of companies across countries. The only significant difference they found is that internal financing is more important in capital market-dominated countries than in countries with bank-dominated financial systems.

The view that cross-country differences are not substantial has since been corroborated by further studies of corporate capital structure. These studies (Deutsche Bundesbank 1994, Rajan and Zingales 1995) attribute the cross-country differences found in older studies to the fact that differences in accounting standards have been neglected.

Other studies (Delbreil et al. 2000[82], Coeurderoy 2001, Friderichs 2001) aim to provide answers to the question whether there are differences in corporate capital structures across countries or not, and whether any observed differences depend on the size of the companies in question. They find that capital structure differs significantly for companies of different sizes. Although there seem to be no significant cross-country differences in the financing of large companies, evidence has been found which supports the view that there are huge cross-country differences in the capital structure of small companies. In particular it has been shown that bank loans are a much more important source of financing for small companies in Germany than in other countries.

[82] To large extent the work by Debreil et al. extends the work undertaken previously by central bank officials and reported in Borio (1995) and Kneeshaw (1995).

A second result of the most recent literature is the observation that there are significant differences in capital structure between equity issuing companies and non-equity issuing companies (Ramb 2000).

For the purpose of the present study, we make the simplifying assumption that at the macro-economic level it is possible to work with aggregate information on the shares of different types of corporate finance.

As there exist no comprehensive data sources on the structure of corporate financing in Europe we use the most recent information available from either the European Commission Bach databank[83] or the OECD (1996) Financial Statements of Non-Financial Enterprises.

The advantage of the Bach databank is that it provides relatively recent data, in most instances for the year 2000. But, its major disadvantage is that it covers only the manufacturing sector and not the economy as a whole. Therefore, whenever the Bach information is used, an implicit assumption is made that the structure of corporate finance of the whole economy is identical to that of the manufacturing sector.

The OECD data suffer from the opposite problem. While they provide information for the economy as a whole, the latest year for which they are available is 1996.

In the absence of any better data source[84], we used a combination of these two databanks for our macroeconomic simulations. We used information from the OECD only in those cases where no data were available in the Bach databank.

It is important to note that, while equity and bond financing clearly defined concepts, the variable "bank financing" in the modified model includes not only bank short- and long-term bank loans but also financing sources whose cost will generally move in line with bank rates such a trade financing, loans by non-bank financial intermediaries, etc.

Table 6.1 below provides for each EU Member State the share used in the baseline scenario of each the three types of corporate financing and the source.

[83] See, for example, Rivaud-Danset and others (2001) for studies using the Bach databank.

[84] Morover, the data from these two databanks do not appear to be entirely consistent with the EU-wide aggregates reported by the ECB and discussed earlier in Section 4.

Table 6.1: Share of Equity, Bond and Bank Financing in Total Corporate Financing

Country	Source	Year	Percentage share of		
			Equity	Bonds	Bank Loans
Austria	OECD	1995	48.5	5.5	46.0
Belgium	OECD	1995	42.8	1.7	55.5
Denmark	OECD	1995	46.5	2.0*	51.5
Finland	EC-Bach	2000	46.2	2.5	51.3
France	EC-Bach	2000	32.1	7.9	60.0
Germany	EC-Bach	2000	32.3	1.2	66.5
Greece	Not available	--	49	3	48
Italy	EC-Bach	2000	32.2	0.9	66.8
Ireland	Not available	--	49	3	48
Luxembourg	Not available	--	43	3	54
Netherlands	OECD	1995	45.6	3.5	50.9
Portugal	EC-Bach	2000	49.2	3.2	47.6
Spain	EC-Bach	2000	40.4	2.7	56.9
Sweden	OECD	1995	39.4	2.0*	58.6
UK	OECD	1995	54.8	2.0*	43.2

Luxembourg's shares are assumed to be identical to those of Belgium, and the shares of Greece and Ireland are assumed to be identical to those of Portugal

Sources: OECD (1996) and the EC Bach (Bank for Accounts of Companies harmonised) databank

Changes in the cost of business finance and in the share of bond finance in total debt finance

The level and simulated change in the cost of each source of business finance are presented in Table 6.2 and the simulated changes in the shares of each finance source are shown in Table 6.3.

The baseline scenario assumes that the funding costs remain constant over the simulation horizon at the level shown under base case scenario in the table below. As noted above, in the simulation scenarios of European financial market integration, the cost reduction is phased in three equal steps in years 2, 3, and 4 of the simulation period so that the new funding cost level is reached in year 4 and stays at that level for the remainder of the simulation horizon.

For simplicity, we will assume that the share of equity financing remains unchanged over the whole simulation period and that the only changes arise in the composition of debt financing with bond financing increasing at the expense of bank financing. The share in bond financing grows in line with the reduction in the cost of bond financing and the share of bank financing falls commensurately.

For example, in Austria the share of bond financing in total corporate financing will rise from 5.5% to 12.3%, an increase of 6.8 percentage points, and the share of bank financing will fall by the same percentage points, i.e. 6.8 percent point.

Table 6.2: Level and Change in Funding Costs to be Used in the Simulations Scenarios

	Equity financing in %		Bond financing in %		Bank financing in %	
	Level	**Change (in bp)**	**Level**	**Change (in bp)**	**Level**	**Change (in bp)**
Austria	4.60	-60	5.85	-40	6.60	-20
Belgium	5.30	-59	5.85	-40	7.20	-20
Denmark	4.30	-57	5.90	-40	6.60	-20
Finland	5.30	-56	5.85	-40	4.50	-20
France	5.60	-59	5.85	-40	5.10	-20
Germany	3.40	-56	5.85	-40	6.60	-20
Greece	5.40	-32	5.85	-40	7.70	-20
Ireland	5.60	-59	5.85	-40	8.10	-20
Italy	5.50	-47	5.85	-40	4.80	-20
Luxembourg	4.60	-59	5.85	-40	6.60	-20
Netherlands	5.10	-51	5.85	-40	6.60	-20
Portugal	6.60	-59	5.85	-40	6.00	-20
Spain	5.50	-23	5.85	-40	6.00	-20
Sweden	4.50	-55	5.90	-40	5.40	-20
UK	4.20	- 37	5.90	-40	6.50	-20

Source: London Economics estimates

Table 6.3: Share of Each Type of Funding Source and Changes in Financing Shares to be Used in the Simulations Scenarios

	Equity share in % of total liabilities		Bond share in % of total liabilities		Bank share in % of total liabilities	
	Level	Change (%)	Level	Change (%)	Level	Change (%)
Austria	48.5	0	5.5	+6.8	46.0	-6.8
Belgium	42.8	0	1.7	+7.6	55.5	-7.6
Denmark	46.5	0	2.0	+6.9	51.5	-6.9
Finland	46.2	0	2.5	+7.0	51.3	-7.0
France	32.1	0	7.9	+9.0	60.0	-9.0
Germany	32.3	0	1.2	+9.0	66.5	-9.0
Greece	49	0	3	+6.9	48	-6.9
Ireland	32.2	0	0.9	+8.9	66.8	-8.9
Italy	49	0	3	+6.7	48	-6.7
Luxembourg	43	0	3	+7.9	54	-7.9
Netherlands	45.6	0	3.5	+7.2	50.9	-7.2
Portugal	49.2	0	3.2	+6.7	47.6	-6.7
Spain	40.4	0	2.7	+7.8	56.9	-7.8
Sweden	39.4	0	2.0	+8.0	58.6	-8.0
UK	54.8	0	2.0	+6.0	43.2	-6.0

Source: London Economics

Fiscal and monetary policy assumptions in the simulations

Fiscal policy is assumed to remain unchanged from the baseline scenario in the various simulations described below. In other words, tax revenues[85] rise in line with level of economic activity and the budget balance improves.

The monetary policy objective remains low inflation and when, relative to the baseline scenario, inflation increases marginally by 0.1 or 0.2 percentage point towards the end of the simulation period, interest rates in the euro-zone rise slightly.

In the simulations we assume that monetary authorities in Denmark, Sweden and the U.K. follow a similar policy stance and interest rates in these three countries rise in tandem with those in the euro-zone.

[85] The only exceptions to this general rule are Greece, where tax revenues are fixed in the OEF model, and Ireland where tax revenues are only paruially linked with economic activity in theOEF model.

Finally, it is assumed that the euro/$US exchange rate remains stable at its baseline line level in the simulations.

6.4 Simulations Results

Summary simulation results are reported in Tables 6.4 to 6.7 and the detailed simulation results are appended at Annex 1. In this section we focus on the long-term simulation results, i.e. the macroeconomic impact of the changes in the user cost of capital in the tenth year of the simulation, while in Annex 1, detailed year-by-year simulation results are presented.

The economics of the simulations indicate that the decrease in the user cost of capital brought about by a reduction in corporate funding costs stimulates investment and hence aggregate demand. The additional investment increases also the stock of productive capital. This in turn increases aggregate supply[86]. Eventually, the increase in aggregate supply is sufficient to meet the increase in aggregate demand and the economy returns to equilibrium.

While, the equilibrium level of output increases in the simulation, there is no change in the long-run growth path of the economies as we do not assume in the simulations reported in Table 6.4 that the change in the user cost of capital would boost productivity.

A case could be made that, as a result of externalities associated with the higher capital stock or a more efficient allocation of capital caused by the full integration of European financial markets, productivity growth may also be permanently boosted by European financial market integration. However, in the absence of robust statistical evidence about such a phenomenon, we have not allowed for such a change in the simulations reported here. The issue of financial market integration and productivity growth is discussed in greater details in Annex 1.

6.4.1 EU-wide simulation results

The key results are that, as a result of the combined reduction in the cost of equity, bond and bank finance together with the increase in the share of bond finance in total debt finance:

- The level of EU-wide real GDP is raised by 1.1%, or €130 billion in 2002 prices, in the long-run;

- GDP per capita in current prices is €600 higher in the EU and GDP per capita at 2002 prices is €350 higher;

[86] The reduction in the user cost of capital also induces some substitution away from labour towards capital in the production process as the price of labour relative to that of capital increases when the user cost of capital declines. But the net effect on employment in the simulations is positive as the demand expansion effect dominates the substitution effect.

- Total business investment is almost 6.0% higher and private consumption is up by 0.8%;

- Total employment is 0.5% higher[87].

Inflation increases marginally in the outer years of the simulation horizon but this is only a temporary phenomenon reflecting the lagged effect of the fact that aggregate demand temporarily exceeds normal capacity during the middle years of the simulation.

The investment shock produces no inflationary pressures in the short run as, in the baseline scenario, EU countries are assumed to still have some excess capacity and unused labour resources in the near term. However, the model assumes that productive resources are fully utilised in the longer run. Therefore, any aggregate demand shock will eventually result in some inflationary pressures over the longer run.

However, in the case of the user-cost-of-capital shock these inflationary pressures manifest themselves only temporarily as the increase in capacity resulting from the boost to investment increases aggregate supply. Eventually the increase in aggregate supply will be large enough to meet the increase in aggregate demand, and inflationary pressures abate, but only with some lag.

A decomposition of the contribution of the various changes in the user cost of capital shows that:

- The reduction in the cost of equity finance is the most important. It accounts for 0.5 percentage point (or 45%) of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices;

- The impact of the reduction of 40 basis points in the cost of bond finance alone is marginal, explaining a further 0.1 percentage point of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices;

- The combination of the reduction in the cost of bond finance together with the increase in the share of bond finance in total debt finance, however, results in a more substantial boost to output. Together these two changes account for 0.3 percentage point of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices.

[87] Total unemployment falls by less than the increase in employment as more people enter the labour market as a result of improved labour market conditions. Moreover, NAIRU is partially dependent on past actual unemployment rates and thus drifts down over the simulation horizon in line with the reduction in the unemployment rate.

Finally, the assumed reduction in the cost of bank finance of 20 basis points also explains 0.3 percentage point of the 1.1 percentage point increase in EU-wide real GDP. While the reduction in the cost of bank finance is only half as large as the fall in the cost of bond finance, the macroeconomic impact of the two changes is identical. This is due to the fact that share of bank finance in total debt finance is much larger than the share of bond finance. Thus, the effects on the user cost of capital of the reductions in the cost of bond finance and bank finance are broadly identical despite being of different magnitude.

Table 6.4: Long-run Impact for the European Union of a Reduction in User Cost of Capital resulting from European Financial Market Integration

	Simulation 1: reduction in the cost of equity finance only	Simulation 2: reduction in the cost of equity and debt finance	Simulation 3: reduction in the cost of equity and debt finance, and increase in share of debt finance	Simulation 4: reduction in the cost of equity, debt and bank finance, and increase in share of debt finance
Absolute change* in the level of:				
- GDP in constant 2002 prices (€ billion)	58.9	66.5	93.6	130.0
- GDP in current prices (€ billion)	105.1	116.4	173.4	224.5
- GDP per capita in constant 2002 prices	157.4	177.7	249.8	347.1
- GDP per capita in current prices	280.5	310.8	461.8	599.1
Percentage change in:				
- GDP in constant prices	0.5	0.6	0.8	1.1
- business investment in constant prices	2.7	3.0	4.4	5.9
- private consumption in constant prices	0.3	0.4	0.5	0.8
- employment	0.1	0.2	0.3	0.5
Absolute change in percentage points of:				
- user cost of capital	-0.2	-0.2	-0.3	-0.4
- unemployment rate	-0.1	-0.1	-0.1	-0.2
- inflation rate	0.1	0.1	0.1	0.2

NOTE: *simulation versus baseline scenario

Source: London Economics and Oxford Economic Forecasting

6.4.2 Detailed country results

The country results of the simulations are presented in Table 6.5. The general pattern that was observed at the EU-wide level is also reflected at the country level.

The most important change is always the reduction in the cost of equity finance while the effect change in the cost of bond finance alone is minimal.

The combined impact of the four changes in the user cost of capital (i.e., the reductions in the cost of equity, bond and bank finance and increase in the share of bond finance in total debt finance) varies somewhat across countries.

The increase in the level of real GDP ranges from 0.3% to 2.0%. But, to some extent, these results are outliers and the majority of EU Member States show an increase in the range of 0.9% to 1.2%.

Among the larger EU Member States, Germany shows an increase of 0.9%, France of 1.4%, Italy of 1.1%, Spain of 1.2% and the U.K. of 1.0%. The slightly larger increase in the case of France reflects the fact that the increase in potential supply pushes prices down more sharply than in the major EU Member States. This is due to the fact that a large proportion of employment in France is in the public sector and public sector wages remain fixed. Thus the aggregated increase in wages arising from the increase in employment is smaller and allows for larger real output gain.

Smaller EU Member States show a larger range of responses, exhibiting in some cases significantly larger/smaller responses: Austria posts an increase in the level of real GDP of 1.1%, Belgium 0.3%, Denmark 1.8%, Finland 1.9%, Greece 0.2%, Netherlands 1.2%, Portugal 1.2% and Sweden 0.8%.

With the exception of Greece, the larger/smaller responses are directly related to trade gains/losses. Denmark and Finland benefit greatly from an increase in net trade with Sweden, in line with the growth in Swedish GDP[88]. This increase in Swedish net imports from Finland and Denmark also dampens somewhat the effect of the reduction in the user cost of capital on the Swedish economy.

The cases of Belgium, and to a lesser extent, Ireland, are the opposite ones. Extremely high import leakages dampen the economy's response to the reduction in the user cost of capital.

Finally, the Greek result is caused largely by the model assumption that taxes for Greece are flat in the model. Thus the net impact of any aggregate demand shock is somewhat more stimulative than in other economies.

The key point to note of this review of the country-specific simulation results is that, while the impact of the reductions in the user cost of capital varies somewhat across countries, it is economically significant in all.

[88] Denmark and Finaland also benefit from an increase in exports to Norway as Norway's GDP is also boosted indirectly by the increase in the level of economic activity in Scandinavia.

It is important to remember that the results presented here abstract from any dynamic effects that could raise permanently output and productivity growth. Thus, they can be said to be relatively conservative estimates of the likely impact of reductions in the user cost of capital brought about by deeper European financial market integration.

Moreover, as we noted in the first section of this report, European financial market integration will likely affect the EU economies through a number of additional channels (better portfolio allocations, greater access to finance, etc). Thus, the overall impact of European financial market integration is likely to be larger than reported in the simulations above that focused on only one key dimension of this integration process.

Table 6.5: Long-run Impact on Member States of a Reduction in User Cost of Capital resulting from European Financial Market Integration

	Simulation 1: reduction in the cost of equity finance only	Simulation 2: reduction in the cost of equity and debt finance	Simulation 3: reduction in the cost of equity and debt finance, and increase in share of debt finance	Simulation 4: reduction in the cost of equity, debt and bank finance, and increase in share of debt finance
% change in the level of GDP in constant prices:				
EU	0.5	0.6	0.8	1.1
Euro-zone	0.5	0.6	0.8	1.1
Austria	0.6	0.4	0.8	1.1
Belgium	0.2	0.2	0.3	0.3
Denmark	0.8	0.9	1.4	1.8
Finland	0.8	0.9	1.5	1.9
France	0.6	0.7	1.1	1.4
Germany	0.5	0.5	0.5	0.9
Greece	0.9	1.0	1.6	2.0
Ireland	0.2	0.3	0.5	0.6
Italy	0.3	0.5	0.8	1.1
Netherlands	0.5	0.6	0.9	1.2
Portugal	0.5	0.6	0.9	1.1
Spain	0.4	0.5	0.9	1.2
Sweden	0.5	0.5	0.7	0.8
UK	0.5	0.5	0.8	1.0

Source: London Economics and Oxford Economic Forecasting

6.5 Sensitivity of Simulation Results to Recent Financial Market Developments

Finally, we have also tested the sensitivity of our estimates with respect to recent developments in financial markets. If we compute the reduction in the cost of the equity capital on the basis of the stock market capitalisations on September 30, 2002, we obtain an average figure of 24.1 basis points (compared to an average reduction of 36.7 basing points used in the macroeconomic simulations reported in Table 6.4). If this smaller estimated reduction in the cost of capital were to be used in the macroeconomic simulation, the overall impact of full European financial market integration on long-run EU-wide GDP (in constant prices) would be about 0.9 percentage point. This compares to the 1.1 percentage points figure reported in Table 6.4.

The estimated economic effects of the reduction in the cost of bond financing depend crucially on the assumption that the euro-denominated corporate bonds issuance will be buoyant enough to close by 25% the gap between the U.S. and the EU in the share of bond financing in total debt financing.

The slowdown in euro-denominated corporate bonds issues in recent months does underline the fact that this required increase in euro-denominated corporate bond issues will require some time and that cyclical or other temporary factors may occasionally slow the general process of shifting towards greater reliance on bond financing. But this will not fundamentally alter the capital market dynamics set in train by financial market integration. [89] Therefore, recent bond market developments give no grounds to change substantially our quantitative estimates of the long run impact of full European financial market integration in the corporate bonds market.

[89] In fact, a number of other likely systemic changes, such as pension reform, will most likely contribute to accelerate the trend away from bank financing in the medium term.

7 Conclusions

Our analysis in this report focuses on the quantification of the economic impact that financial integration will have on firms' cost of capital through the reduction in trading costs for equity, a reduction of credit spreads, issuance costs and trading costs for bond financing. Equity and bond financing account on average for approximately 50% of the total liabilities of firms across Europe. In our macroeconomic simulations we also incorporate additional assumptions on the impact of financial integration on the cost of the bank finance.

Equity Markets

We start by quantifying the likely impact of full integration of European financial markets on equity trading costs and on the costs of equity capital. Building on the recent literature examining the link between a given stock's trading costs, the characteristics of the stock and the size of the stock exchange on which it is traded, we develop and estimate an econometric model of trading costs and turnover using information on trading costs and stock characteristics of practically all the stocks traded over the period of January 2000 to December 2001 on the major stock exchanges of the OECD countries. Our results suggest that trading costs could fall sharply as a result of full integration of European stock markets.

We then develop and estimate a model linking a firm's cost of equity capital to the trading costs of the firm's equity on secondary markets. As with previous studies of this issue, we find a strong, positive relationship between trading costs and the cost of capital.

Finally, we use our models of the cost of equity capital to estimate for each EU Member State the impact that the reduction in trading costs arising from full European financial market integration (see discussion above) would have on the cost of equity capital. We find that the cost of capital would fall by more than 40 basis points for the majority of the European countries. This estimate is very similar to the reduction of less than 50 basis points in the cost of capital expected by the vast majority of financial market participants participating in our survey of key financial market participants (see below).

In our macro-economic simulations of the impact of European financial market integration, we also allow for a further reduction of 10 basis arising from reduced clearance and settlement costs. This would imply a total reduction in the cost of equity capital stemming from full integration of European financial markets of, on average, 50 basis points across EU Member States.

Bond markets

Next, we examine how European financial market integration may lower the cost of market debt for non-financial corporations. In contrast to equity financing, we believe that the most pronounced impact on financial market integration will be felt on the primary bond markets. Financial market integration will result in a deeper and even more liquid market, and should lead to further reductions in the credit spread (or risk spread relative to a comparable risk-free security) required by investors.

We find that the recent growth in the stock of Euro-denominated corporate bonds issues by European non-financial corporations has resulted in a significant decrease in the credit spread as investors in Europe and elsewhere in the world have become more familiar with European non-financial corporate debt.

Our estimation results suggest that the rapid growth in the stock of Euro-denominated corporate bonds since January 1999 reduced the credit spread by about 90 basis points.

In our macro-economic simulations of the impact of financial market integration, we assume that this effect continues and that it will reduce the costs of market debt by about 40 basis points for all non-financial European corporations alike.

We do not expect the risk-free rate to fall much further as a result of deeper financial market integration. Furthermore, as gross debt issuance costs have already fallen significantly to a level broadly similar to that prevailing in the United States, we assume that gross issuance costs will not fall further with continued financial market integration.

The secondary market for European corporate debt is still very much in its infancy. Trading volume is still relatively low and, presently, many investors prefer to hold their bonds to maturity. This is likely to change in the future as the primary market grows and new, more transparent and more liquid, trading platforms develop. Our empirical analysis finds no support for the hypothesis that a larger market (in terms of overall liquidity) should significantly reduce trading costs. Nevertheless, it is not obvious that, at the present time, secondary market trading costs are taken into account by investors in their bond investment decisions as most bonds are typically held to maturity. Therefore, we do not believe it is appropriate to incorporate a trading cost decline in our simulations.

Survey of financial markets' participants

In this section we presented the findings from the PwC/London Economics' survey of European financial market participants, which surveyed the views of a range of market players in relation to the likely magnitude of financial integration impacts. It is useful to summarise the main conclusions from the survey, as follows:

- 73% of participants surveyed were of the view that integration of financial markets would result in lower brokerage commissions and other direct/explicit transactions costs. 59% stated that they expected bid-ask spreads would decrease following integration, and 45% of that they would expect price impact of transactions to decrease.

- The expected magnitudes of these impacts were 11% in terms of lower brokerage fees and other direct trading costs, and 8% in terms of lower bid-ask spread and lower price impact of trades.

- 47% of interviewees across the six countries were of the view that equity yields would decrease as a result of full integration of markets. Of these, 70% were of the view that equity yields could decrease by up to 50 basis points and 10% by between 51-100 basis points. This implies that of all respondents 33% expect the decrease to be between 0 and 50 basis points and 6% above 50 basis points.

- 46% of market participants were of the view that bond financing costs would fall following full integration of markets. Of these, 71% expected that bond yields could fall by up to 50 basis points, and 14% by between 51-100 basis points. This implies that, of all respondents 33% expect the decrease to be between 0 and 50 basis points and 6% above 50 basis points.

- Among the important benefits of market integration cited by market participants are enhanced opportunities for diversification/portfolio choice and increased liquidity.

- Among the more likely benefits of market integration cited by market participants are increased competition among exchanges and financial intermediaries and greater competition facing banks and other more traditional sources of corporate finance.

Macroeconomic simulations

Our simulations of the macro-economic impact of integration of European financial markets have been carried out using our multi-country macro-economic model. The key simulation results to note are that, as a result of the combined reduction in the cost of equity, bond and bank finance, together with the increase in the share of bond finance in total debt finance:

- The level of EU-wide real GDP is raised by 1.1%, or €130 billion in 2002 prices, in the long-run;

- GDP per capita in current prices is €600 higher in the EU and GDP per

capita at 2002 prices is €350 higher;

- Total business investment is almost 6.0% higher and private consumption is up by 0.8%;

- Total employment is 0.5% higher.

A decomposition of the contribution of the various changes in the user cost of capital shows that:

- The reduction in the cost of equity finance is the most important impact, accounting for 0.5 percentage points (or 45%) of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices;

- The impact of the reduction of 40 basis points in the cost of bond finance alone is marginal, explaining a further 0.1 percentage point of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices;

- The combination of the reduction in the cost of bond finance together with the increase in the share of bond finance in total debt finance, however, results in a more substantial boost to output. Together these two changes account for 0.3 percentage point of the 1.1 percentage point increase in the EU-wide level of GDP in constant prices;

- Finally, the assumed reduction in the cost of bank finance of 20 basis points also explains 0.3 percentage point of the 1.1 percentage point increase in EU-wide real GDP.

While the reduction in the cost of bank finance is only half as large as the fall in the cost of bond finance, the macroeconomic impact of the two changes is identical. This is due to the fact that share of bank finance in total debt finance is much larger than the share of bond finance. Thus, the impact on the user cost of capital of the reductions in the cost of bond finance and bank finance are broadly identical despite being of different magnitude.

The combined impact of the four changes in the user cost of capital (i.e., the reductions in the cost of equity, bond and bank finance and increase in the share of bond finance in total debt finance) varies somewhat across countries. Across the EU, the estimated increase in the level of real GDP stemming from integration of financial markets ranges from 0.3% to 2.0%. However, the majority of Member States show an increase in the range of 0.9% to 1.2%.

The important point to note of these simulation results is that, while the impact of the reductions in the user cost of capital varies somewhat across countries, it is economically significant in all.

It is also important to remember that the results presented here abstract from any dynamic effects that could raise permanently output and productivity

growth. Thus, these can be said to be relatively conservative estimates of the likely impact of reductions in the user cost of capital brought about by deeper European financial market integration.

Sensitivity of simulation results to recent financial market developments

Finally, we have also tested the sensitivity of our estimates with respect to recent developments in financial markets. If we compute the reduction in the cost of the equity capital on the basis of the stock market capitalisations on September 30, 2002, we obtain an average figure of 24.1 basis points (compared to an average reduction of 36.7 basing points using the average capitalisation of stock markets in 2001). If this smaller estimated reduction in the cost of capital were to be used in the macroeconomic simulation, the overall impact of full European financial market integration on long-run EU-wide GDP would be about 0.9 percentage point. This compares to the 1.1 percentage points figure reported in the base case (using the average capitalisation in 2001).

The estimated economic effects of the reduction in the cost of bond financing depend crucially on the assumption that the euro-denominated corporate bonds issuance will be buoyant enough to close by 25% the gap between the U.S. and the EU in the share of bond financing in total debt financing.

The slowdown in euro-denominated corporate bonds issues in recent months does underline the fact that this required increase in euro-denominated corporate bond issues will require some time and that cyclical or other temporary factors may occasionally slow the general process of shifting towards greater reliance on bond financing. But this will not fundamentally alter the capital market dynamics set in train by financial market integration. [90] Therefore, recent bond market developments give no grounds to change substantially our quantitative estimates of the long run impact of full European financial market integration in the corporate bonds market.

[90] In fact, a number of other likely systemic changes, such as pension reform, will most likely contribute to accelerate the trend away from bank financing in the medium term.

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Annex 1 Detailed Simulation Results

In the following pages, we present the detailed macroeconomic results of the simulations of the various changes to the costs of capital. For each change, we report the results for the EU as a whole, for the Eurozone and for the individual Member States.

Information is provided on the change on the level of GDP at current and constant prices, GDP per capita employment and unemployment, the current account balance and the budget balance, consumption and investment in constant prices.

It is important to note that while the simulation results are reported for specific calendar years ranging from 2003 to 2012, the purpose of the simulations is to estimate the equilibrium or long-run impact of the changes in the user cost of capital brought about by the deepening of European financial market integration.

Therefore, the precise temporal dimension is largely irrelevant and it is preferable to view the simulations as being run over ten years and consider the tenth year as the year in which the new equilibrium is reached.

Not much emphasis should be put either on the precise length of the period required to reach the new equilibrium as for technical reasons we decided to implement the changes in the user cost of capital over three years. An alternative approach would have been to implement the whole change in one single period. Although the magnitude of the short-run dynamics would have been somewhat different, the long run equilibrium would have been the same.

Results Of Simulation 1: Changing The Cost Of Equity Finance Only

Summary results

Absolute differences: simulation minus baseline

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP in Euro billion										
Nominal GDP for Eurozone and EU (Euro bn)										
EUROZONE	.9	4.3	10.5	18.9	27.1	34.8	43.0	52.6	64.1	78.3
EU total	1.2	6.0	15.1	27.6	39.5	50.5	61.1	72.9	87.1	105.1
GDP at 1995 constant prices (Euro bn)										
EUROZONE	.8	3.9	9.4	16.6	22.7	27.7	31.8	34.9	37.6	40.8
EU total	1.0	4.9	12.0	21.0	28.5	34.4	39.0	42.7	45.9	49.7
GDP at 2002 constant prices (Euro bn)										
EUROZONE	.9	4.4	10.5	18.5	25.4	31.0	35.5	39.1	42.1	45.6
EU total	1.2	5.9	14.2	24.9	33.8	40.8	46.2	50.5	54.4	58.9
GDP per capita for EU (Euro)										
nominal	3.2	16.1	40.5	73.8	105.9	135.0	163.4	194.8	232.7	280.5
1995 const price	2.7	13.3	32.1	56.2	76.3	92.1	104.2	114.0	122.7	132.8
2002 const price	3.2	15.7	38.1	66.6	90.5	109.1	123.5	135.1	145.4	157.4
EMPLOYMENT (000s)										
EUROZONE	.0	.0	.1	.1	.1	.1	.2	.2	.2	.2
EU total	.0	.0	.1	.1	.2	.2	.2	.2	.2	.2
UNEMPLOYMENT RATE (%)										
EUROZONE	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1
EU total	.0	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1
BUDGET BALANCE as % of GDP (positive=surplus)										
EUROZONE	.0	.0	.0	.1	.1	.1	.2	.2	.2	.2
EU total	.0	.0	.0	.1	.1	.1	.2	.2	.2	.2
CPI INFLATION RATE (%)										
EU average	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1
INTEREST RATES (%, nominal)										
short rate	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
long rate	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
USER COST OF CAPITAL (%, real)										
EU UCC real	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2

Percentage differences: simulation versus baseline

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Nominal GDP for Eurozone and EU (Euro bn)										
EUROZONE	.0	.1	.1	.2	.3	.4	.4	.5	.6	.7
EU total	.0	.1	.1	.3	.4	.4	.5	.6	.6	.7
GDP at 1995 constant prices (Euro bn)										
EUROZONE	.0	.1	.1	.2	.3	.4	.4	.5	.5	.5
EU total	.0	.1	.1	.2	.3	.4	.4	.5	.5	.5
GDP at 2002 constant prices (Euro bn)										
EUROZONE	.0	.1	.1	.2	.3	.4	.4	.5	.5	.5
EU total	.0	.1	.1	.2	.3	.4	.4	.5	.5	.5
GDP per capita for EU (Euro)										
nominal	.0	.1	.1	.3	.4	.4	.5	.6	.6	.7
1995 const price	.0	.1	.1	.2	.3	.4	.4	.5	.5	.5
2002 const price	.0	.1	.1	.2	.3	.4	.4	.5	.5	.5
PRIVATE CONSUMPTION at 1995 prices										
EUROZONE	.0	.0	.0	.1	.2	.2	.2	.3	.3	.3
EU total	.0	.0	.1	.1	.2	.2	.3	.3	.3	.3
BUSINESS INVESTMENT at 1995 prices										
EUROZONE	.1	.4	.9	1.5	1.8	2.1	2.3	2.4	2.5	2.6
EU total	.1	.4	.9	1.5	1.9	2.1	2.3	2.4	2.6	2.7
EMPLOYMENT (000s)										
EUROZONE	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1
EU total	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1
TRADE										
EXPORTS at 1995 prices										
EU total	.0	.1	.2	.3	.3	.3	.3	.4	.4	.4
IMPORTS at 1995 prices										
EU total	.0	.1	.3	.4	.5	.5	.5	.6	.6	.6

Simulation 1
Detailed results

EURO ZONE
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	TOTAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE ($/EURO)	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.1	0.0	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.3	0.1	0.1	-20.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.6	0.1	0.2	-49.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2006	0.1	1.0	0.2	0.3	-82.9	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2007	0.2	1.2	0.3	0.4	-105.4	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2008	0.2	1.4	0.4	0.5	-122.2	0.1	0.3	0.0	0.0	0.0	-0.1	0.1
2009	0.2	1.5	0.4	0.5	-134.9	0.1	0.3	0.1	0.0	0.0	-0.1	0.2
2010	0.3	1.6	0.5	0.6	-143.3	0.1	0.4	0.2	0.0	0.0	-0.1	0.2
2011	0.3	1.7	0.5	0.6	-147.3	0.1	0.5	0.2	0.0	0.0	-0.1	0.2
2012	0.3	1.8	0.5	0.6	-154.8	0.1	0.6	0.3	0.1	0.0	-0.1	0.2

GERMANY
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF DP!)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.1	-4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.1	0.1	0.2	-11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2006	0.1	0.1	0.2	0.3	-18.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2007	0.1	0.2	0.3	0.4	-22.2	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2008	0.2	0.2	0.3	0.5	-26.3	0.1	0.2	0.0	0.0	0.0	-0.1	0.2
2009	0.2	0.2	0.4	0.6	-31.3	0.1	0.2	0.0	0.0	0.0	-0.1	0.2
2010	0.2	0.2	0.4	0.6	-36.2	0.1	0.3	0.1	0.0	0.0	0.0	0.2
2011	0.2	0.2	0.4	0.7	-39.0	0.1	0.4	0.1	0.0	0.0	0.0	0.2
2012	0.3	0.2	0.5	0.7	-40.4	0.2	0.5	0.2	0.1	0.0	0.0	0.3

FRANCE
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.1	0.2	0.2	-8.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1
2006	0.1	0.1	0.3	0.4	-12.5	0.1	0.2	0.0	0.0	0.0	0.0	0.1
2007	0.2	0.2	0.4	0.5	-12.9	0.1	0.2	0.0	0.0	0.0	0.0	0.1
2008	0.2	0.2	0.5	0.6	-11.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2
2009	0.3	0.3	0.5	0.6	-7.8	0.0	0.3	0.0	0.0	0.0	0.0	0.2
2010	0.3	0.3	0.6	0.6	-4.1	0.0	0.3	0.0	0.0	0.0	0.0	0.2
2011	0.3	0.3	0.6	0.7	-1.3	0.0	0.3	0.0	0.0	0.0	0.0	0.2
2012	0.3	0.3	0.6	0.7	-0.3	0.0	0.3	0.0	0.1	0.0	0.0	0.2

ITALY
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.1	-3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.1	0.1	0.2	-8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2006	0.0	0.1	0.2	0.3	-15.8	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2007	0.1	0.2	0.3	0.4	-21.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2008	0.1	0.2	0.3	0.5	-24.7	0.1	0.2	0.0	0.0	0.0	0.0	0.1
2009	0.1	0.2	0.4	0.5	-27.5	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2010	0.1	0.2	0.4	0.5	-30.0	0.1	0.3	0.1	0.0	0.0	-0.1	0.2
2011	0.2	0.3	0.4	0.5	-32.0	0.2	0.4	0.1	0.0	0.0	-0.1	0.2
2012	0.2	0.3	0.5	0.6	-33.2	0.2	0.5	0.2	0.1	0.0	-0.1	0.2

Simulation 1

UK

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES (ex.MIPS)	SHORT-TERM INTEREST RATE (PTS)	EFFECTIVE EXCHANGE RATE	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2006	0.2	0.2	0.3	0.4	0.0	0.1	0.3	0.1	0.0	0.0	-0.1	0.1
2007	0.3	0.3	0.3	0.5	0.0	0.1	0.4	0.1	0.0	0.0	-0.1	0.1
2008	0.3	0.3	0.4	0.5	0.0	0.1	0.5	0.2	0.0	0.0	-0.1	0.1
2009	0.3	0.4	0.4	0.6	0.0	0.1	0.6	0.2	0.0	0.0	-0.1	0.1
2010	0.3	0.4	0.4	0.6	0.0	0.1	0.6	0.2	0.0	0.0	-0.1	0.1
2011	0.3	0.4	0.5	0.7	0.0	0.1	0.7	0.3	0.0	0.0	-0.1	0.1
2012	0.3	0.4	0.5	0.7	0.0	0.1	0.7	0.3	0.1	0.0	-0.1	0.1

SPAIN

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.1	-2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.1	0.2	-4.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2006	0.1	0.2	0.2	0.3	-7.2	0.0	0.1	0.0	0.0	0.0	-0.1	0.0
2007	0.2	0.2	0.2	0.3	-8.2	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2008	0.3	0.3	0.3	0.4	-10.8	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2009	0.3	0.4	0.4	0.5	-13.5	0.1	0.4	0.1	0.0	0.0	-0.1	0.1
2010	0.4	0.4	0.4	0.5	-16.1	0.1	0.5	0.2	0.0	0.0	-0.1	0.1
2011	0.4	0.4	0.4	0.5	-18.3	0.1	0.7	0.4	0.0	0.0	-0.2	0.1
2012	0.5	0.5	0.4	0.5	-20.4	0.1	0.9	0.6	0.1	0.0	-0.1	0.0

NETHERLANDS .

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF DP!)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2006	0.2	0.3	0.3	0.4	0.0	0.1	0.3	0.0	0.0	0.0	-0.1	0.1
2007	0.2	0.4	0.4	0.4	0.0	0.1	0.4	0.1	0.0	0.0	-0.1	0.1
2008	0.3	0.4	0.4	0.5	0.0	0.1	0.5	0.1	0.0	0.0	-0.1	0.1
2009	0.4	0.5	0.5	0.4	0.0	0.1	0.6	0.2	0.0	0.0	-0.2	0.1
2010	0.4	0.5	0.5	0.4	0.0	0.1	0.7	0.3	0.0	0.0	-0.2	0.1
2011	0.5	0.6	0.5	0.4	0.0	0.1	0.8	0.4	0.0	0.0	-0.2	0.1
2012	0.5	0.6	0.5	0.3	0.0	0.1	0.9	0.5	0.1	0.0	-0.3	0.1

BELGIUM .

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-0.8	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
2005	0.1	0.1	0.1	0.1	-2.0	0.0	0.1	0.1	0.0	0.0	-0.1	0.1
2006	0.1	0.1	0.2	0.2	-3.2	0.1	0.3	0.1	0.0	0.0	-0.2	0.1
2007	0.2	0.1	0.2	0.2	-3.9	0.1	0.4	0.3	0.0	0.0	-0.3	0.1
2008	0.2	0.2	0.2	0.2	-3.6	0.1	0.5	0.3	0.0	0.0	-0.3	0.1
2009	0.2	0.2	0.2	0.2	-3.2	0.1	0.6	0.3	0.0	0.0	-0.4	0.1
2010	0.2	0.3	0.2	0.2	-2.9	0.1	0.6	0.3	0.0	0.0	-0.5	0.2
2011	0.3	0.3	0.2	0.2	-2.9	0.1	0.7	0.3	0.0	0.0	-0.5	0.2
2012	0.3	0.4	0.2	0.2	-2.9	0.1	0.8	0.3	0.1	0.0	-0.6	0.2

Simulation 1

SWEDEN
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.3	0.0	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.2	0.2	0.3	0.5	0.0	0.1	0.3	0.1	0.0	0.0	-0.1	0.1
2007	0.3	0.3	0.4	0.5	0.0	0.1	0.5	0.3	0.0	0.0	-0.2	0.2
2008	0.3	0.3	0.3	0.4	0.0	0.1	0.7	0.4	0.0	0.0	-0.2	0.2
2009	0.4	0.3	0.3	0.4	0.0	0.1	0.8	0.5	0.0	0.0	-0.2	0.2
2010	0.4	0.4	0.3	0.4	0.0	0.1	0.9	0.5	0.0	0.0	-0.3	0.2
2011	0.4	0.4	0.4	0.5	0.0	0.2	0.9	0.5	0.0	0.0	-0.3	0.2
2012	0.4	0.5	0.4	0.5	0.0	0.2	0.9	0.5	0.1	0.0	-0.3	0.3

AUSTRIA .
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.2	-1.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
2005	0.1	0.1	0.2	0.4	-2.2	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.1	0.2	0.3	0.7	-3.2	0.1	0.2	0.0	0.0	0.0	-0.2	0.1
2007	0.2	0.2	0.4	0.9	-3.7	0.1	0.3	0.0	0.0	0.0	-0.2	0.2
2008	0.2	0.3	0.5	0.9	-4.2	0.1	0.4	0.0	0.0	0.0	-0.2	0.2
2009	0.3	0.3	0.5	1.0	-4.6	0.1	0.4	0.0	0.0	0.0	-0.3	0.3
2010	0.3	0.3	0.6	1.1	-4.3	0.1	0.5	0.1	0.0	0.0	-0.3	0.3
2011	0.3	0.3	0.6	1.1	-3.7	0.1	0.6	0.2	0.0	0.0	-0.3	0.3
2012	0.3	0.3	0.6	1.0	-3.8	0.1	0.7	0.2	0.1	0.0	-0.2	0.3

GREECE .
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.1	0.1	0.2	-2.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.2	0.2	0.3	0.4	-6.5	0.2	0.1	0.0	0.0	0.0	-0.1	-0.1
2006	0.3	0.5	0.6	0.6	-13.1	0.3	0.1	0.0	0.0	0.0	-0.1	-0.1
2007	0.5	0.7	0.8	0.8	-20.7	0.5	0.2	0.0	0.0	0.0	-0.1	-0.1
2008	0.7	0.8	0.9	1.0	-27.8	0.7	0.2	0.1	0.0	0.0	-0.1	-0.2
2009	0.8	0.9	0.9	1.0	-33.3	0.8	0.4	0.2	0.0	0.0	-0.1	-0.2
2010	0.9	0.9	0.9	0.9	-37.0	0.9	0.5	0.4	0.0	0.0	-0.1	-0.2
2011	0.9	0.8	0.8	0.8	-38.7	0.9	0.7	0.6	0.0	0.0	-0.2	-0.3
2012	1.4	1.7	0.9	1.0	-43.9	1.0	0.9	0.8	0.1	0.0	-0.3	-0.4

DENMARK
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2005	0.1	0.1	0.2	0.2	-1.3	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.1	0.2	0.4	0.4	-2.1	0.1	0.3	0.0	0.0	0.0	-0.1	0.3
2007	0.2	0.3	0.5	0.6	-2.7	0.1	0.4	0.0	0.0	0.0	-0.2	0.4
2008	0.3	0.4	0.6	0.6	-2.8	0.1	0.5	0.0	0.0	0.0	-0.2	0.4
2009	0.4	0.5	0.7	0.7	-2.6	0.1	0.6	0.0	0.0	0.0	-0.2	0.5
2010	0.5	0.5	0.7	0.7	-2.5	0.1	0.6	0.0	0.0	0.0	-0.1	0.5
2011	0.6	0.6	0.8	0.8	-2.4	0.1	0.7	0.0	0.0	0.0	-0.1	0.6
2012	0.6	0.7	0.8	0.8	-2.3	0.1	0.8	0.0	0.1	0.0	-0.2	0.6

Simulation 1

FINLAND .

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.2	-1.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.1	0.2	0.3	0.4	-2.0	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2007	0.2	0.3	0.5	0.5	-2.8	0.1	0.3	0.0	0.0	0.0	-0.1	0.2
2008	0.3	0.3	0.6	0.6	-3.3	0.1	0.3	0.0	0.0	0.0	-0.1	0.2
2009	0.3	0.4	0.6	0.6	-3.7	0.1	0.4	0.0	0.0	0.0	0.0	0.3
2010	0.4	0.4	0.7	0.7	-4.0	0.2	0.4	0.0	0.0	0.0	0.0	0.3
2011	0.4	0.4	0.7	0.7	-4.4	0.2	0.5	0.0	0.0	0.0	0.0	0.3
2012	0.4	0.4	0.8	0.8	-4.7	0.2	0.5	0.0	0.1	0.0	0.0	0.4

IRELAND

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE ($ PER PUNT)	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.2	-1.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0
2006	0.1	0.2	0.3	0.3	-2.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0
2007	0.2	0.2	0.4	0.4	-2.8	0.1	0.4	0.1	0.0	0.0	0.0	0.0
2008	0.3	0.3	0.4	0.4	-2.9	0.1	0.5	0.2	0.0	0.0	0.0	0.0
2009	0.3	0.3	0.4	0.4	-2.6	0.1	0.7	0.4	0.0	0.0	0.0	0.0
2010	0.4	0.3	0.4	0.4	-2.0	0.1	1.0	0.6	0.0	0.0	0.0	-0.1
2011	0.4	0.3	0.3	0.4	-1.3	0.1	1.2	0.9	0.0	0.0	0.0	-0.1
2012	0.4	0.2	0.2	0.3	-0.4	0.0	1.5	1.2	0.1	0.0	0.0	-0.2

PORTUGAL .

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.0	0.2	0.3	-3.4	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2006	-0.1	-0.1	0.4	0.5	-5.6	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2007	-0.1	-0.1	0.5	0.6	-7.2	0.1	0.2	0.0	0.0	0.0	0.0	0.2
2008	-0.1	-0.1	0.6	0.6	-7.6	0.1	0.2	0.1	0.0	0.0	0.0	0.2
2009	0.0	0.0	0.6	0.6	-7.3	0.1	0.4	0.1	0.0	0.0	0.0	0.2
2010	0.0	0.0	0.6	0.6	-6.7	0.1	0.5	0.3	0.0	0.0	0.0	0.2
2011	0.0	0.0	0.6	0.5	-5.9	0.1	0.7	0.5	0.0	0.0	0.0	0.2
2012	0.1	0.0	0.5	0.5	-4.9	0.1	0.9	0.7	0.1	0.0	0.0	0.1

II. Results Of Simulation 2: Changing The Cost Of Equity and Bond Finance

Summary results

Absolute differences: simulation minus baseline

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP in Euro billion										
Nominal GDP for Eurozone and EU (Euro bn)										
EUROZONE	1.0	4.6	11.4	20.9	30.1	38.8	48.1	58.8	71.5	86.9
EU total	1.3	6.4	16.3	30.3	43.9	56.2	68.3	81.6	97.1	116.4
GDP at 1995 constant prices (Euro bn)										
EUROZONE	.9	4.2	10.2	18.3	25.3	30.9	35.4	39.1	42.4	46.1
EU total	1.1	5.3	12.9	23.1	31.7	38.4	43.5	47.8	51.7	56.2
GDP at 2002 constant prices (Euro bn)										
EUROZONE	1.0	4.7	11.4	20.5	28.3	34.6	39.6	43.8	47.4	51.6
EU total	1.3	6.3	15.3	27.4	37.6	45.5	51.6	56.7	61.3	66.5
GDP per capita for EU (Euro)										
nominal	3.4	17.3	43.7	81.2	117.4	150.4	182.7	218.0	259.5	310.8
1995 const price	2.9	14.2	34.7	62.0	85.0	102.7	116.5	127.8	138.2	149.9
2002 const price	3.4	16.8	41.1	73.4	100.7	121.8	138.0	151.5	163.8	177.7
EMPLOYMENT (000s)										
EUROZONE	.0	.0	.1	.1	.1	.2	.2	.2	.2	.2
EU total	.0	.0	.1	.1	.2	.2	.2	.2	.3	.3
UNEMPLOYMENT RATE (%)										
EUROZONE	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1
EU total	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1
BUDGET BALANCE as % of GDP (positive=surplus)										
EUROZONE	.0	.0	.0	.1	.1	.1	.2	.2	.2	.2
EU total	.0	.0	.1	.1	.1	.2	.2	.2	.2	.2
CPI INFLATION RATE RATE (%)										
EU average	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1
INTEREST RATES (%, nominal)										
short rate	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1
long rate	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
USER COST OF CAPITAL (%, real)										
EU UCC real	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2

Percentage differences: simulation versus baseline

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Nominal GDP for Eurozone and EU (Euro bn)										
EUROZONE	.0	.1	.1	.2	.3	.4	.5	.6	.7	.8
EU total	.0	.1	.2	.3	.4	.5	.6	.6	.7	.8
GDP at 1995 constant prices (Euro bn)										
EUROZONE	.0	.1	.2	.3	.4	.4	.5	.5	.5	.6
EU total	.0	.1	.2	.3	.4	.4	.5	.5	.5	.6
GDP at 2002 constant prices (Euro bn)										
EUROZONE	.0	.1	.2	.3	.4	.4	.5	.5	.5	.6
EU total	.0	.1	.2	.3	.4	.4	.5	.5	.5	.6
GDP per capita for EU (Euro)										
nominal	.0	.1	.2	.3	.4	.5	.6	.6	.7	.8
1995 const price	.0	.1	.2	.3	.4	.4	.5	.5	.5	.6
2002 const price	.0	.1	.2	.3	.4	.4	.5	.5	.5	.6
PRIVATE CONSUMPTION at 1995 prices										
EUROZONE	.0	.0	.1	.1	.2	.2	.3	.3	.3	.4
EU total	.0	.0	.1	.1	.2	.2	.3	.3	.3	.4
BUSINESS INVESTMENT at 1995 prices										
EUROZONE	.1	.4	1.0	1.6	2.1	2.3	2.6	2.7	2.8	3.0
EU total	.1	.5	1.0	1.7	2.1	2.4	2.6	2.7	2.9	3.0
EMPLOYMENT (000s)										
EUROZONE	.0	.0	.0	.1	.1	.1	.1	.1	.2	.2
EU total	.0	.0	.0	.1	.1	.1	.1	.1	.1	.2
TRADE										
EXPORTS at 1995 prices										
EU total	.0	.1	.2	.3	.3	.4	.4	.4	.4	.4
IMPORTS at 1995 prices										
EU total	.0	.1	.3	.4	.5	.6	.6	.6	.7	.7

Simulation 2

Detailed results

EURO ZONE

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	TOTAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE ($/EURO)	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.1	0.0	0.0	-4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.3	0.1	0.1	-22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.6	0.2	0.2	-52.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2006	0.1	1.1	0.3	0.4	-91.0	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2007	0.2	1.4	0.4	0.5	-117.1	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2008	0.2	1.6	0.4	0.6	-136.3	0.1	0.3	0.0	0.0	0.0	-0.1	0.1
2009	0.3	1.7	0.5	0.6	-150.8	0.1	0.4	0.1	0.0	0.0	-0.1	0.2
2010	0.3	1.8	0.5	0.6	-161.5	0.1	0.4	0.2	0.0	0.0	-0.1	0.2
2011	0.3	1.9	0.5	0.7	-167.1	0.2	0.5	0.3	0.1	0.0	-0.1	0.2
2012	0.4	2.0	0.6	0.7	-175.3	0.2	0.6	0.4	0.1	0.0	-0.1	0.2

GERMANY

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.1	0.1	0.2	-11.5	0.0	0.1	0.0	0.0	0.0	0.0	0.1
2006	0.1	0.1	0.2	0.4	-19.6	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2007	0.2	0.2	0.3	0.5	-24.6	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2008	0.2	0.2	0.4	0.6	-29.4	0.1	0.2	0.0	0.0	0.0	-0.1	0.2
2009	0.2	0.2	0.4	0.7	-35.3	0.1	0.3	0.0	0.0	0.0	-0.1	0.2
2010	0.3	0.3	0.5	0.7	-40.9	0.1	0.3	0.1	0.0	0.0	-0.1	0.3
2011	0.3	0.3	0.5	0.8	-43.9	0.2	0.4	0.1	0.1	0.0	-0.1	0.3
2012	0.3	0.3	0.5	0.8	-45.6	0.2	0.5	0.2	0.1	0.0	0.0	0.3

FRANCE

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.2	-9.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1
2006	0.1	0.2	0.3	0.4	-14.1	0.1	0.2	0.0	0.0	0.0	0.0	0.1
2007	0.2	0.2	0.4	0.5	-14.5	0.1	0.3	0.0	0.0	0.0	0.0	0.1
2008	0.2	0.3	0.5	0.6	-11.9	0.1	0.3	0.0	0.0	0.0	0.0	0.2
2009	0.3	0.3	0.6	0.6	-8.3	0.0	0.3	0.0	0.0	0.0	-0.1	0.2
2010	0.3	0.3	0.6	0.7	-5.4	0.0	0.4	0.0	0.0	0.0	-0.1	0.2
2011	0.3	0.3	0.7	0.7	-3.9	0.0	0.4	0.0	0.1	0.0	-0.1	0.2
2012	0.4	0.4	0.7	0.8	-3.3	0.0	0.4	0.0	0.1	0.0	-0.1	0.2

ITALY .

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.1	-3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.1	0.1	0.2	-9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2006	0.0	0.1	0.2	0.4	-17.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2007	0.1	0.2	0.3	0.5	-23.5	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2008	0.1	0.2	0.4	0.5	-27.7	0.1	0.2	0.0	0.0	0.0	0.0	0.1
2009	0.1	0.2	0.4	0.5	-31.0	0.2	0.2	0.0	0.0	0.0	-0.1	0.2
2010	0.2	0.3	0.5	0.6	-33.8	0.2	0.3	0.1	0.0	0.0	-0.1	0.2
2011	0.2	0.3	0.5	0.6	-35.8	0.2	0.4	0.1	0.1	0.0	-0.1	0.2
2012	0.3	0.3	0.5	0.6	-36.8	0.2	0.5	0.2	0.1	0.0	-0.1	0.2

Simulation 2

UK

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES (ex.MIPS)	SHORT-TERM INTEREST RATE (PTS)	EFFECTIVE EXCHANGE RATE	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
2006	0.2	0.2	0.3	0.4	0.0	0.1	0.3	0.1	0.0	0.0	-0.1	0.1
2007	0.3	0.3	0.4	0.5	0.0	0.1	0.5	0.1	0.0	0.0	-0.1	0.1
2008	0.3	0.4	0.4	0.6	0.0	0.1	0.6	0.2	0.0	0.0	-0.1	0.1
2009	0.4	0.4	0.5	0.7	0.0	0.1	0.6	0.2	0.0	0.0	-0.1	0.1
2010	0.4	0.4	0.5	0.7	0.0	0.1	0.7	0.3	0.0	0.0	-0.1	0.1
2011	0.3	0.4	0.5	0.8	0.0	0.1	0.7	0.3	0.1	0.0	-0.1	0.1
2012	0.3	0.4	0.5	0.8	0.0	0.1	0.8	0.4	0.1	0.0	-0.1	0.1

SPAIN

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	-2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.1	0.2	-5.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2006	0.2	0.2	0.2	0.3	-8.3	0.1	0.1	0.0	0.0	0.0	-0.1	0.0
2007	0.2	0.3	0.3	0.4	-9.3	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2008	0.3	0.4	0.3	0.5	-12.4	0.1	0.3	0.0	0.0	0.0	-0.1	0.1
2009	0.4	0.4	0.4	0.6	-15.1	0.1	0.4	0.1	0.0	0.0	-0.2	0.1
2010	0.5	0.5	0.5	0.6	-17.9	0.1	0.6	0.2	0.0	0.0	-0.2	0.1
2011	0.5	0.5	0.5	0.6	-20.0	0.1	0.8	0.4	0.1	0.0	-0.2	0.1
2012	0.6	0.5	0.5	0.6	-22.3	0.2	1.0	0.6	0.1	0.0	-0.2	0.1

NETHERLANDS

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.2	0.2	0.3	0.0	0.0	0.1	0.0	0.0	0.0	-0.1	0.0
2006	0.2	0.3	0.4	0.4	0.0	0.1	0.3	0.0	0.0	0.0	-0.1	0.1
2007	0.3	0.4	0.5	0.5	0.0	0.1	0.4	0.1	0.0	0.0	-0.1	0.1
2008	0.3	0.5	0.5	0.5	0.0	0.1	0.5	0.2	0.0	0.0	-0.1	0.1
2009	0.4	0.5	0.5	0.5	0.0	0.1	0.6	0.2	0.0	0.0	-0.2	0.1
2010	0.5	0.6	0.6	0.5	0.0	0.1	0.7	0.3	0.0	0.0	-0.2	0.1
2011	0.5	0.6	0.6	0.4	0.0	0.1	0.9	0.4	0.1	0.0	-0.3	0.1
2012	0.6	0.7	0.6	0.3	0.0	0.1	1.0	0.5	0.1	0.0	-0.3	0.1

BELGIUM

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-0.8	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
2005	0.1	0.1	0.1	0.1	-2.1	0.1	0.1	0.1	0.0	0.0	-0.1	0.1
2006	0.1	0.1	0.2	0.2	-3.4	0.1	0.3	0.2	0.0	0.0	-0.2	0.1
2007	0.2	0.2	0.3	0.3	-4.2	0.1	0.4	0.3	0.0	0.0	-0.3	0.2
2008	0.2	0.2	0.2	0.2	-4.1	0.1	0.6	0.4	0.0	0.0	-0.4	0.2
2009	0.2	0.2	0.2	0.2	-3.7	0.1	0.6	0.3	0.0	0.0	-0.4	0.2
2010	0.3	0.3	0.2	0.2	-3.3	0.1	0.7	0.3	0.0	0.0	-0.5	0.2
2011	0.3	0.3	0.2	0.2	-3.2	0.1	0.8	0.4	0.1	0.0	-0.6	0.2
2012	0.4	0.4	0.2	0.2	-3.0	0.1	0.9	0.4	0.1	0.0	-0.6	0.2

Simulation 2

SWEDEN

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.3	0.0	0.1	0.1	0.1	0.0	0.0	-0.1	0.1
2006	0.2	0.2	0.3	0.5	0.0	0.1	0.3	0.1	0.0	0.0	-0.1	0.1
2007	0.3	0.3	0.4	0.6	0.0	0.2	0.5	0.3	0.0	0.0	-0.2	0.2
2008	0.4	0.3	0.4	0.5	0.0	0.2	0.7	0.5	0.0	0.0	-0.2	0.2
2009	0.4	0.4	0.3	0.4	0.0	0.2	0.9	0.6	0.0	0.0	-0.3	0.2
2010	0.4	0.4	0.4	0.4	0.0	0.2	0.9	0.5	0.0	0.0	-0.3	0.2
2011	0.4	0.5	0.4	0.5	0.0	0.2	1.0	0.6	0.1	0.0	-0.3	0.3
2012	0.5	0.5	0.5	0.6	0.0	0.2	1.0	0.5	0.1	0.0	-0.4	0.3

AUSTRIA

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.2	-1.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
2005	0.1	0.1	0.2	0.5	-2.3	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.1	0.2	0.3	0.8	-3.4	0.1	0.2	0.0	0.0	0.0	-0.2	0.2
2007	0.2	0.3	0.4	1.0	-3.9	0.1	0.3	0.0	0.0	0.0	-0.2	0.2
2008	0.3	0.3	0.5	1.0	-4.4	0.1	0.4	0.0	0.0	0.0	-0.2	0.3
2009	0.3	0.3	0.6	1.1	-4.6	0.1	0.5	0.0	0.0	0.0	-0.3	0.3
2010	0.3	0.3	0.6	1.1	-4.1	0.1	0.6	0.1	0.0	0.0	-0.3	0.3
2011	0.4	0.4	0.6	1.1	-3.5	0.1	0.7	0.2	0.1	0.0	-0.3	0.3
2012	0.4	0.4	0.6	1.1	-3.4	0.1	0.9	0.3	0.1	0.0	-0.2	0.3

GREECE

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.1	0.1	0.2	-2.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.2	0.3	0.3	0.4	-7.0	0.2	0.1	0.0	0.0	0.0	-0.1	-0.1
2006	0.4	0.5	0.6	0.7	-14.3	0.3	0.1	0.0	0.0	0.0	-0.1	-0.1
2007	0.6	0.7	0.9	0.9	-22.9	0.5	0.2	0.0	0.0	0.0	-0.1	-0.1
2008	0.8	0.9	1.0	1.1	-30.8	0.7	0.3	0.1	0.0	0.0	-0.1	-0.2
2009	0.9	1.0	1.1	1.1	-37.2	0.9	0.4	0.2	0.0	0.0	-0.2	-0.2
2010	1.0	1.0	1.0	1.0	-41.6	1.0	0.6	0.4	0.0	0.0	-0.2	-0.3
2011	1.0	0.9	0.9	0.9	-43.6	1.0	0.8	0.7	0.1	0.0	-0.2	-0.3
2012	1.6	1.9	1.0	1.1	-49.4	1.1	1.0	0.9	0.1	0.0	-0.3	-0.4

DENMARK

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-0.6	0.0	0.0	0.0	0.0	0.0	-0.1	0.1
2005	0.1	0.1	0.2	0.3	-1.4	0.1	0.1	0.0	0.0	0.0	-0.1	0.2
2006	0.2	0.2	0.4	0.5	-2.3	0.1	0.3	0.0	0.0	0.0	-0.2	0.3
2007	0.3	0.3	0.6	0.6	-3.0	0.1	0.4	0.0	0.0	0.0	-0.2	0.4
2008	0.4	0.5	0.7	0.7	-3.1	0.1	0.6	0.0	0.0	0.0	-0.2	0.5
2009	0.5	0.5	0.8	0.8	-3.0	0.1	0.7	0.0	0.0	0.0	-0.2	0.6
2010	0.6	0.6	0.8	0.8	-2.8	0.1	0.7	0.0	0.0	0.0	-0.2	0.6
2011	0.6	0.7	0.9	0.9	-2.7	0.1	0.8	0.0	0.1	0.0	-0.2	0.7
2012	0.7	0.7	0.9	0.9	-2.5	0.1	0.8	0.0	0.1	0.0	-0.2	0.7

Simulation 2

FINLAND

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.2	-1.2	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.2	0.2	0.3	0.4	-2.2	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2007	0.2	0.3	0.5	0.5	-3.1	0.1	0.3	0.0	0.0	0.0	-0.1	0.2
2008	0.3	0.4	0.6	0.6	-3.7	0.1	0.4	0.0	0.0	0.0	-0.1	0.2
2009	0.4	0.4	0.7	0.7	-4.1	0.2	0.4	0.0	0.0	0.0	0.0	0.3
2010	0.4	0.4	0.8	0.8	-4.5	0.2	0.5	0.0	0.0	0.0	0.0	0.3
2011	0.4	0.5	0.8	0.8	-4.9	0.2	0.5	0.0	0.1	0.0	0.0	0.4
2012	0.4	0.5	0.9	0.9	-5.2	0.2	0.6	0.0	0.1	0.0	0.0	0.4

IRELAND

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE ($ PER PUNT)	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.2	-1.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0
2006	0.2	0.2	0.3	0.4	-2.4	0.1	0.3	0.1	0.0	0.0	0.0	0.0
2007	0.2	0.3	0.4	0.4	-3.1	0.2	0.4	0.1	0.0	0.0	0.0	0.0
2008	0.3	0.3	0.5	0.5	-3.3	0.2	0.6	0.3	0.0	0.0	0.0	0.0
2009	0.4	0.3	0.5	0.5	-3.0	0.1	0.8	0.4	0.0	0.0	0.0	0.0
2010	0.4	0.3	0.4	0.5	-2.4	0.1	1.1	0.7	0.0	0.0	0.0	-0.1
2011	0.4	0.3	0.4	0.4	-1.5	0.1	1.4	1.0	0.1	0.0	0.0	-0.1
2012	0.4	0.3	0.3	0.4	-0.5	0.0	1.7	1.3	0.1	0.0	0.0	-0.2

PORTUGAL

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	-0.1	0.3	0.3	-3.7	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2006	-0.1	-0.1	0.5	0.5	-6.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2
2007	-0.1	-0.1	0.6	0.6	-8.0	0.2	0.2	0.0	0.0	0.0	0.0	0.2
2008	-0.1	-0.1	0.7	0.7	-8.6	0.2	0.3	0.1	0.0	0.0	0.1	0.2
2009	-0.1	-0.1	0.7	0.7	-8.4	0.2	0.4	0.2	0.0	0.0	0.1	0.2
2010	0.0	0.0	0.7	0.7	-7.7	0.2	0.6	0.3	0.0	0.0	0.0	0.2
2011	0.0	0.0	0.6	0.6	-6.7	0.1	0.8	0.5	0.1	0.0	0.0	0.2
2012	0.1	0.0	0.6	0.6	-5.7	0.1	1.0	0.8	0.1	0.0	0.0	0.1

III. Results Of Simulation 3: Changing The Cost Of Equity and Bond Finance and the Share of Bond Finance

Summary results

Absolute differences: simulation minus baseline

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP in Euro billion										
Nominal GDP for Eurozone and EU (Euro bn)										
EUROZONE	1.2	6.1	15.6	29.5	43.3	56.8	71.0	86.9	104.9	126.2
EU total	1.7	8.7	22.7	43.2	63.6	82.8	101.9	122.5	145.6	173.0
GDP at 1995 constant prices (Euro bn)										
EUROZONE	1.1	5.4	13.7	25.3	35.3	43.4	49.7	54.7	59.1	63.6
EU total	1.4	7.0	17.6	32.3	44.9	54.5	61.8	67.8	73.2	79.0
GDP at 2002 constant prices (Euro bn)										
EUROZONE	1.2	6.1	15.3	28.3	39.6	48.6	55.6	61.3	66.1	71.2
EU total	1.6	8.3	20.9	38.3	53.1	64.6	73.3	80.3	86.7	93.6
GDP per capita for EU (Euro)										
nominal	4.5	23.4	60.9	115.8	170.3	221.6	272.5	327.3	388.9	461.8
1995 const price	3.7	18.8	47.3	86.7	120.1	145.8	165.4	181.1	195.5	210.8
2002 const price	4.4	22.2	56.0	102.7	142.3	172.8	196.0	214.6	231.7	249.8
EMPLOYMENT (000s)										
EUROZONE	.0	.0	.1	.1	.2	.2	.3	.3	.3	.3
EU total	.0	.0	.1	.2	.2	.3	.3	.4	.4	.4
UNEMPLOYMENT RATE (%)										
EUROZONE	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1
EU total	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1
BUDGET BALANCE as % of GDP (positive=surplus)										
EUROZONE	.0	.0	.1	.1	.2	.2	.2	.3	.3	.3
EU total	.0	.0	.1	.1	.2	.2	.2	.3	.3	.3
CPI INFLATION RATE RATE (%)										
EU average	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1
INTEREST RATES (%, nominal)										
short rate	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1
long rate	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
USER COST OF CAPITAL (%, real)										
EU UCC real	-.1	-.2	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3

percentage differences:simulation versus baseline

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Nominal GDP for Eurozone and EU (Euro bn)										
EUROZONE	.0	.1	.2	.3	.5	.6	.7	.9	1.0	1.1
EU total	.0	.1	.2	.4	.6	.7	.8	1.0	1.1	1.2
GDP at 1995 constant prices (Euro bn)										
EUROZONE	.0	.1	.2	.4	.5	.6	.7	.7	.7	.8
EU total	.0	.1	.2	.4	.5	.6	.7	.7	.8	.8
GDP at 2002 constant prices (Euro bn)										
EUROZONE	.0	.1	.2	.4	.5	.6	.7	.7	.7	.8
EU total	.0	.1	.2	.4	.5	.6	.7	.7	.8	.8
GDP per capita for EU (Euro)										
nominal	.0	.1	.2	.4	.6	.7	.8	1.0	1.1	1.2
1995 const price	.0	.1	.2	.4	.5	.6	.7	.7	.8	.8
2002 const price	.0	.1	.2	.4	.5	.6	.7	.7	.8	.8
PRIVATE CONSUMPTION at 1995 prices										
EUROZONE	.0	.0	.1	.1	.2	.3	.4	.4	.5	.5
EU total	.0	.0	.1	.2	.3	.3	.4	.5	.5	.5
BUSINESS INVESTMENT at 1995 prices										
EUROZONE	.1	.6	1.4	2.3	3.0	3.4	3.7	3.9	4.1	4.3
EU total	.1	.6	1.4	2.4	3.0	3.5	3.8	4.0	4.2	4.4
EMPLOYMENT (000s)										
EUROZONE	.0	.0	.1	.1	.2	.2	.2	.2	.2	.2
EU total	.0	.0	.1	.1	.1	.2	.2	.2	.2	.2
TRADE										
EXPORTS at 1995 prices										
EU total	.0	.1	.3	.5	.6	.6	.6	.7	.7	.8
IMPORTS at 1995 prices										
EU total	.0	.2	.5	.7	.8	.9	1.0	1.0	1.1	1.2

Simulation 3
Detailed results:

EURO ZONE
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	TOTAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE ($/EURO)	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.1	0.0	0.0	-5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.4	0.1	0.1	-29.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.9	0.2	0.3	-72.7	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.1	1.6	0.4	0.5	-130.4	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2007	0.2	2.0	0.5	0.7	-171.8	0.2	0.3	0.0	0.0	0.0	-0.1	0.2
2008	0.3	2.3	0.6	0.8	-202.8	0.2	0.4	0.1	0.0	0.0	-0.1	0.2
2009	0.4	2.5	0.7	0.9	-225.5	0.2	0.5	0.2	0.1	0.0	-0.2	0.2
2010	0.4	2.7	0.7	0.9	-239.3	0.2	0.6	0.3	0.1	0.0	-0.2	0.3
2011	0.5	2.8	0.7	0.9	-246.3	0.2	0.8	0.4	0.1	0.0	-0.2	0.3
2012	0.5	2.9	0.8	0.9	-255.7	0.2	0.9	0.5	0.1	0.0	-0.2	0.3

GERMANY
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.1	0.1	0.2	-13.2	0.0	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.1	0.2	0.3	0.5	-25.6	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2007	0.2	0.2	0.4	0.7	-34.3	0.1	0.2	0.0	0.0	0.0	-0.1	0.2
2008	0.3	0.3	0.5	0.8	-42.7	0.1	0.3	0.0	0.0	0.0	-0.1	0.2
2009	0.3	0.3	0.6	0.9	-50.1	0.2	0.4	0.0	0.1	0.0	-0.1	0.3
2010	0.3	0.3	0.6	0.9	-52.9	0.2	0.4	0.1	0.1	0.0	-0.2	0.3
2011	0.3	0.3	0.6	0.8	-52.1	0.2	0.5	0.2	0.1	0.0	-0.2	0.3
2012	0.3	0.3	0.5	0.7	-47.2	0.2	0.6	0.3	0.1	0.0	-0.2	0.3

FRANCE
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.2	0.3	-10.6	0.0	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.1	0.2	0.4	0.5	-17.4	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2007	0.2	0.3	0.5	0.6	-18.5	0.1	0.3	0.0	0.0	0.0	-0.1	0.2
2008	0.3	0.3	0.6	0.7	-16.2	0.1	0.4	0.0	0.0	0.0	-0.1	0.2
2009	0.4	0.4	0.7	0.8	-13.9	0.1	0.4	0.0	0.1	0.0	-0.1	0.2
2010	0.4	0.4	0.8	0.9	-13.0	0.1	0.5	0.0	0.1	0.0	-0.1	0.3
2011	0.5	0.5	0.9	1.1	-13.3	0.1	0.5	-0.1	0.1	0.0	-0.1	0.3
2012	0.5	0.6	1.1	1.2	-14.3	0.1	0.6	-0.1	0.1	0.0	-0.1	0.4

ITALY
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.1	-5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.1	0.2	0.3	-14.4	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2006	0.0	0.2	0.3	0.5	-26.4	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2007	0.1	0.3	0.4	0.7	-36.0	0.2	0.2	0.0	0.0	0.0	0.0	0.2
2008	0.1	0.3	0.5	0.8	-42.5	0.2	0.3	0.0	0.0	0.0	0.0	0.2
2009	0.2	0.4	0.6	0.8	-47.5	0.2	0.4	0.0	0.1	0.0	-0.1	0.2
2010	0.2	0.4	0.7	0.9	-51.4	0.3	0.5	0.1	0.1	0.0	-0.1	0.3
2011	0.3	0.5	0.8	0.9	-54.2	0.3	0.6	0.2	0.1	0.0	-0.1	0.3
2012	0.4	0.5	0.8	1.0	-56.0	0.3	0.8	0.3	0.1	0.0	-0.1	0.3

Simulation 3

UK

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES (ex.MIPS)	SHORT-TERM INTEREST RATE (PTS)	EFFECTIVE EXCHANGE RATE	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.2	0.2	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1
2006	0.3	0.4	0.4	0.6	0.0	0.1	0.4	0.1	0.0	0.0	-0.1	0.1
2007	0.4	0.5	0.6	0.8	0.0	0.1	0.7	0.2	0.0	0.0	-0.1	0.1
2008	0.5	0.6	0.7	0.9	0.0	0.1	0.8	0.3	0.0	0.0	-0.1	0.2
2009	0.5	0.6	0.7	1.0	0.0	0.1	1.0	0.3	0.1	0.0	-0.1	0.2
2010	0.5	0.6	0.8	1.1	0.0	0.2	1.1	0.4	0.1	0.0	-0.1	0.2
2011	0.5	0.7	0.8	1.2	0.0	0.2	1.2	0.5	0.1	0.0	-0.1	0.2
2012	0.5	0.7	0.8	1.3	0.0	0.2	1.3	0.6	0.1	0.0	-0.1	0.2

SPAIN

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.1	-1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.1	0.1	0.2	-4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.2	0.2	0.3	-8.3	0.1	0.1	0.0	0.0	0.0	-0.1	0.0
2006	0.3	0.4	0.3	0.6	-13.4	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2007	0.4	0.5	0.5	0.6	-15.6	0.1	0.3	0.0	0.0	0.0	-0.2	0.1
2008	0.5	0.6	0.6	0.8	-20.3	0.1	0.5	0.0	0.0	0.0	-0.2	0.1
2009	0.6	0.7	0.7	0.9	-24.5	0.2	0.7	0.2	0.1	0.0	-0.3	0.2
2010	0.8	0.8	0.8	1.0	-28.5	0.2	0.9	0.4	0.1	0.0	-0.3	0.2
2011	0.8	0.9	0.8	1.1	-31.9	0.2	1.2	0.6	0.1	0.0	-0.3	0.2
2012	0.9	0.9	0.9	1.1	-35.4	0.2	1.6	0.9	0.1	0.0	-0.3	0.1

NETHERLANDS

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.3	0.4	0.4	0.0	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2006	0.2	0.5	0.6	0.6	0.0	0.1	0.4	0.1	0.0	0.0	-0.1	0.1
2007	0.4	0.6	0.7	0.8	0.0	0.1	0.6	0.1	0.0	0.0	-0.1	0.1
2008	0.5	0.7	0.8	0.8	0.0	0.2	0.8	0.2	0.0	0.0	-0.2	0.1
2009	0.6	0.8	0.8	0.8	0.0	0.2	1.0	0.4	0.1	0.0	-0.2	0.1
2010	0.7	0.9	0.9	0.7	0.0	0.2	1.2	0.5	0.1	0.0	-0.3	0.1
2011	0.8	1.0	0.9	0.7	0.0	0.2	1.4	0.7	0.1	0.0	-0.4	0.1
2012	0.9	1.1	0.9	0.6	0.0	0.2	1.6	0.8	0.1	0.0	-0.4	0.1

BELGIUM

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	-1.3	0.0	0.1	0.0	0.0	0.0	-0.1	0.0
2005	0.1	0.1	0.2	0.2	-3.2	0.1	0.2	0.1	0.0	0.0	-0.2	0.1
2006	0.2	0.2	0.3	0.3	-5.2	0.1	0.4	0.2	0.0	0.0	-0.3	0.2
2007	0.3	0.2	0.4	0.4	-6.4	0.2	0.7	0.4	0.0	0.0	-0.4	0.2
2008	0.3	0.3	0.4	0.4	-6.3	0.2	0.9	0.6	0.0	0.0	-0.5	0.2
2009	0.3	0.3	0.3	0.3	-5.7	0.1	1.0	0.6	0.1	0.0	-0.6	0.3
2010	0.4	0.4	0.3	0.3	-5.0	0.1	1.1	0.6	0.1	0.0	-0.7	0.3
2011	0.4	0.5	0.3	0.3	-4.9	0.1	1.2	0.6	0.1	0.0	-0.7	0.3
2012	0.5	0.6	0.3	0.3	-5.0	0.1	1.3	0.6	0.1	0.0	-0.8	0.3

Simulation 3

SWEDEN

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.2	0.2	0.3	0.5	0.0	0.1	0.2	0.1	0.0	0.0	-0.1	0.1
2006	0.3	0.4	0.5	0.7	0.0	0.2	0.5	0.2	0.0	0.0	-0.2	0.2
2007	0.5	0.5	0.6	0.8	0.0	0.2	0.8	0.4	0.0	0.0	-0.2	0.3
2008	0.6	0.5	0.6	0.7	0.0	0.2	1.1	0.7	0.0	0.0	-0.3	0.3
2009	0.6	0.5	0.5	0.6	0.0	0.2	1.3	0.8	0.1	0.0	-0.3	0.3
2010	0.6	0.6	0.5	0.6	0.0	0.2	1.4	0.9	0.1	0.0	-0.4	0.3
2011	0.6	0.7	0.6	0.8	0.0	0.3	1.5	0.8	0.1	0.0	-0.4	0.4
2012	0.7	0.8	0.7	0.9	0.0	0.3	1.6	0.8	0.1	0.0	-0.5	0.5

AUSTRIA

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.3	-1.5	0.0	0.1	0.0	0.0	0.0	-0.1	0.1
2005	0.1	0.1	0.3	0.7	-3.2	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2006	0.2	0.3	0.5	1.1	-4.9	0.1	0.3	0.0	0.0	0.0	-0.2	0.2
2007	0.3	0.4	0.7	1.4	-5.6	0.1	0.5	0.0	0.0	0.0	-0.3	0.3
2008	0.4	0.4	0.8	1.5	-5.3	0.1	0.7	0.0	0.0	0.0	-0.3	0.4
2009	0.5	0.5	0.8	1.5	-4.7	0.1	0.8	0.1	0.1	0.0	-0.4	0.4
2010	0.5	0.5	0.8	1.5	-4.2	0.1	1.0	0.3	0.1	0.0	-0.4	0.4
2011	0.5	0.5	0.8	1.5	-4.1	0.1	1.2	0.4	0.1	0.0	-0.4	0.5
2012	0.6	0.5	0.8	1.6	-4.4	0.1	1.4	0.6	0.1	0.0	-0.2	0.5

GREECE

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.1	0.2	0.2	-3.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.3	0.4	0.5	0.6	-10.3	0.2	0.1	0.0	0.0	0.0	-0.1	-0.1
2006	0.6	0.7	0.9	1.0	-21.2	0.5	0.2	0.0	0.0	0.0	-0.1	-0.2
2007	0.9	1.1	1.3	1.4	-33.9	0.8	0.3	0.0	0.0	0.0	-0.2	-0.2
2008	1.2	1.3	1.5	1.6	-45.7	1.1	0.5	0.1	0.0	0.0	-0.2	-0.3
2009	1.4	1.5	1.6	1.6	-55.2	1.3	0.7	0.3	0.1	0.0	-0.2	-0.3
2010	1.5	1.5	1.5	1.5	-61.7	1.4	0.9	0.7	0.1	0.0	-0.2	-0.4
2011	1.5	1.3	1.3	1.3	-64.9	1.5	1.2	1.0	0.1	0.0	-0.2	-0.5
2012	2.4	3.0	1.6	1.7	-74.3	1.7	1.6	1.3	0.1	0.0	-0.4	-0.6

Simulation 3

DENMARK

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.2	-0.9	0.0	0.1	0.0	0.0	0.0	-0.1	0.1
2005	0.1	0.1	0.3	0.4	-2.2	0.1	0.2	0.0	0.0	0.0	-0.1	0.2
2006	0.2	0.3	0.6	0.7	-3.6	0.2	0.4	0.0	0.0	0.0	-0.2	0.4
2007	0.4	0.5	0.9	0.9	-4.6	0.2	0.7	0.0	0.0	0.0	-0.2	0.6
2008	0.6	0.7	1.0	1.1	-4.9	0.2	0.9	0.1	0.0	0.0	-0.2	0.8
2009	0.7	0.8	1.1	1.1	-4.5	0.2	1.1	0.1	0.1	0.0	-0.2	0.8
2010	0.9	0.9	1.2	1.2	-4.0	0.2	1.2	0.2	0.1	0.0	-0.2	0.9
2011	1.0	1.1	1.3	1.3	-3.7	0.2	1.3	0.1	0.1	0.0	-0.2	1.0
2012	1.1	1.2	1.4	1.5	-3.8	0.2	1.4	0.1	0.1	0.0	-0.2	1.1

FINLAND

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	-0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.2	0.3	0.3	-1.9	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.2	0.3	0.5	0.6	-3.4	0.1	0.3	0.0	0.0	0.0	-0.1	0.2
2007	0.4	0.5	0.8	0.8	-4.8	0.2	0.4	0.0	0.0	0.0	-0.1	0.3
2008	0.5	0.6	1.0	1.0	-5.9	0.2	0.6	-0.1	0.0	0.0	-0.1	0.4
2009	0.6	0.7	1.1	1.1	-6.7	0.3	0.6	-0.1	0.1	0.0	0.0	0.5
2010	0.7	0.7	1.2	1.2	-7.3	0.3	0.7	-0.1	0.1	0.0	0.0	0.5
2011	0.7	0.8	1.3	1.3	-8.2	0.3	0.7	-0.1	0.1	0.0	0.1	0.6
2012	0.8	0.8	1.5	1.4	-8.9	0.3	0.8	-0.1	0.1	0.0	0.1	0.7

IRELAND

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE ($ PER PUNT)	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	-0.9	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.2	0.3	0.3	-2.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0
2006	0.3	0.3	0.5	0.6	-3.7	0.2	0.4	0.1	0.0	0.0	0.0	0.0
2007	0.4	0.4	0.6	0.7	-4.8	0.2	0.7	0.2	0.0	0.0	0.0	0.0
2008	0.5	0.5	0.7	0.8	-5.1	0.2	1.0	0.4	0.0	0.0	0.0	0.0
2009	0.6	0.5	0.7	0.8	-4.7	0.2	1.3	0.7	0.1	0.0	0.0	0.0
2010	0.6	0.5	0.7	0.8	-3.8	0.2	1.7	1.1	0.1	0.0	0.0	-0.1
2011	0.7	0.5	0.6	0.7	-2.5	0.1	2.2	1.6	0.1	0.0	0.0	-0.2
2012	0.6	0.4	0.5	0.6	-1.2	0.1	2.7	2.1	0.1	0.0	0.0	-0.3

PORTUGAL

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.2	0.2	-2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2005	-0.1	-0.1	0.4	0.4	-5.5	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2006	-0.1	-0.1	0.7	0.7	-9.3	0.2	0.2	0.1	0.0	0.0	0.0	0.2
2007	-0.1	-0.1	0.9	0.9	-12.0	0.2	0.3	0.1	0.0	0.0	0.1	0.3
2008	-0.1	-0.1	1.0	1.0	-12.8	0.3	0.5	0.1	0.0	0.0	0.1	0.3
2009	-0.1	-0.1	1.0	1.0	-12.6	0.2	0.7	0.3	0.1	0.0	0.1	0.3
2010	0.0	0.0	1.0	1.0	-11.6	0.2	0.9	0.5	0.1	0.0	0.1	0.3
2011	0.1	0.0	1.0	0.9	-10.4	0.2	1.2	0.8	0.1	0.0	0.0	0.3
2012	0.1	0.0	0.9	0.9	-9.0	0.2	1.6	1.2	0.1	0.0	0.0	0.2

IV. Results Of Simulation 4: Changing The Cost Of Equity, Bond and Bank Finance and the Share of Bond Finance

Summary results

Absolute differences: simulation minus baseline

GDP in Euro billion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Nominal GDP for Eurozone and EU (Euro bn)										
EUROZONE	1.9	9.5	23.1	41.8	60.0	77.2	94.7	114.4	137.6	166.9
EU total	2.5	12.7	32.0	59.0	85.5	109.9	133.5	158.7	188.0	224.5
GDP at 1995 constant prices (Euro bn)										
EUROZONE	1.8	8.6	20.7	36.7	50.4	61.3	70.0	77.3	83.6	90.4
EU total	2.1	10.6	25.7	45.5	62.3	75.3	85.3	93.6	101.3	109.7
GDP at 2002 constant prices (Euro bn)										
EUROZONE	2.0	9.6	23.2	41.0	56.3	68.6	78.3	86.5	93.5	101.1
EU total	2.5	12.5	30.5	54.0	73.8	89.2	101.0	110.9	120.1	130.0
GDP per capita for EU (Euro)										
nominal	6.7	34.2	85.8	158.1	228.9	294.1	356.9	424.2	502.1	599.4
1995 const price	5.7	28.4	68.9	122.1	166.8	201.5	228.0	250.2	270.6	292.9
2002 const price	6.8	33.6	81.7	144.6	197.7	238.8	270.2	296.5	320.7	347.1
EMPLOYMENT (000s)										
EUROZONE	.0	.0	.1	.2	.3	.3	.4	.4	.4	.4
EU total	.0	.1	.1	.3	.3	.4	.4	.5	.5	.5
UNEMPLOYMENT RATE (%)										
EUROZONE	.0	.0	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.2
EU total	.0	.0	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.2
BUDGET BALANCE as % of GDP (positive=surplus)										
EUROZONE	.0	.0	.1	.2	.2	.3	.3	.4	.4	.4
EU total	.0	.0	.1	.2	.2	.3	.3	.4	.4	.4
CPI INFLATION RATE RATE (%)										
EU average	.0	.0	.0	.0	.0	.1	.1	.1	.2	.2
INTEREST RATES (%, nominal)										
short rate	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1
long rate	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
USER COST OF CAPITAL (%, real)										
EU UCC real	-.1	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4

percentage differences:simulation versus baseline

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Nominal GDP for Eurozone and EU (Euro bn)										
EUROZONE	.0	.1	.3	.5	.7	.8	1.0	1.1	1.3	1.5
EU total	.0	.1	.3	.5	.8	.9	1.1	1.2	1.4	1.6
GDP at 1995 constant prices (Euro bn)										
EUROZONE	.0	.1	.3	.5	.7	.8	.9	1.0	1.1	1.1
EU total	.0	.1	.3	.5	.7	.8	.9	1.0	1.1	1.1
GDP at 2002 constant prices (Euro bn)										
EUROZONE	.0	.1	.3	.5	.7	.8	.9	1.0	1.1	1.1
EU total	.0	.1	.3	.5	.7	.8	.9	1.0	1.1	1.1
GDP per capita for EU (Euro)										
nominal	.0	.1	.3	.5	.8	.9	1.1	1.2	1.4	1.6
1995 const price	.0	.1	.3	.5	.7	.8	.9	1.0	1.1	1.1
2002 const price	.0	.1	.3	.5	.7	.8	.9	1.0	1.1	1.1
PRIVATE CONSUMPTION at 1995 prices										
EUROZONE	.0	.0	.1	.2	.3	.4	.5	.6	.7	.8
EU total	.0	.0	.1	.2	.4	.5	.6	.6	.7	.8
BUSINESS INVESTMENT at 1995 prices										
EUROZONE	.2	.9	2.0	3.2	4.1	4.6	5.0	5.3	5.6	5.8
EU total	.2	.9	2.0	3.2	4.1	4.7	5.0	5.3	5.6	5.9
EMPLOYMENT (000s)										
EUROZONE	.0	.0	.1	.2	.2	.2	.3	.3	.3	.3
EU total	.0	.0	.1	.2	.2	.2	.3	.3	.3	.3
TRADE										
EXPORTS at 1995 prices										
EU total	.0	.2	.4	.6	.7	.7	.8	.8	.9	.9
IMPORTS at 1995 prices										
EU total	.1	.3	.5	.8	1.0	1.1	1.2	1.3	1.3	1.4

Simulation 4
Detailed results

EURO ZONE
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	TOTAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE ($/EURO)	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.1	0.0	0.0	-8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.6	0.1	0.2	-45.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	1.3	0.3	0.5	-108.2	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.2	2.1	0.5	0.8	-183.9	0.2	0.3	0.0	0.0	0.0	-0.1	0.2
2007	0.3	2.7	0.7	1.0	-235.7	0.2	0.4	0.0	0.0	0.0	-0.1	0.2
2008	0.4	3.1	0.8	1.1	-274.3	0.2	0.6	0.1	0.1	0.0	-0.2	0.3
2009	0.5	3.4	0.9	1.2	-302.1	0.3	0.7	0.2	0.1	0.0	-0.2	0.3
2010	0.6	3.6	1.0	1.3	-321.9	0.3	0.8	0.3	0.1	0.0	-0.2	0.4
2011	0.7	3.8	1.1	1.3	-335.3	0.3	1.0	0.4	0.1	0.0	-0.2	0.4
2012	0.8	4.0	1.1	1.3	-354.4	0.3	1.1	0.6	0.1	0.0	-0.3	0.4

GERMANY
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.2	-10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.1	0.3	0.5	-25.2	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.2	0.3	0.5	0.8	-42.5	0.1	0.2	-0.1	0.0	0.0	-0.1	0.2
2007	0.3	0.4	0.6	1.1	-54.0	0.2	0.4	-0.1	0.0	0.0	-0.1	0.3
2008	0.4	0.4	0.8	1.2	-63.3	0.2	0.5	0.0	0.1	0.0	-0.1	0.4
2009	0.5	0.5	0.9	1.3	-71.3	0.3	0.5	0.0	0.1	0.0	-0.1	0.5
2010	0.5	0.5	0.9	1.4	-76.6	0.3	0.6	0.1	0.1	0.0	-0.1	0.5
2011	0.6	0.5	0.9	1.4	-79.1	0.3	0.7	0.1	0.1	0.0	-0.1	0.5
2012	0.5	0.5	0.9	1.3	-76.9	0.3	0.8	0.3	0.1	0.0	-0.2	0.5

FRANCE .
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.2	-7.9	0.0	0.1	0.0	0.0	0.0	0.0	0.1
2005	0.1	0.2	0.3	0.5	-17.9	0.1	0.2	0.0	0.0	0.0	0.0	0.1
2006	0.2	0.3	0.6	0.7	-26.2	0.1	0.3	0.0	0.0	0.0	-0.1	0.2
2007	0.3	0.4	0.7	0.9	-24.9	0.1	0.5	0.0	0.0	0.0	-0.1	0.3
2008	0.4	0.5	0.9	1.0	-21.9	0.1	0.6	0.0	0.1	0.0	-0.1	0.3
2009	0.5	0.6	1.0	1.1	-19.0	0.1	0.6	0.0	0.1	0.0	-0.1	0.3
2010	0.6	0.6	1.1	1.3	-17.6	0.1	0.7	-0.1	0.1	0.0	-0.2	0.4
2011	0.7	0.7	1.3	1.4	-18.3	0.1	0.7	-0.1	0.1	0.0	-0.2	0.4
2012	0.8	0.8	1.4	1.6	-20.9	0.1	0.8	-0.2	0.1	0.0	-0.1	0.5

ITALY .
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.1	0.2	-8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.1	0.2	0.4	-20.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2006	0.1	0.2	0.4	0.7	-35.9	0.2	0.2	0.0	0.0	0.0	-0.1	0.2
2007	0.1	0.3	0.6	0.9	-48.7	0.2	0.3	0.0	0.0	0.0	-0.1	0.2
2008	0.2	0.4	0.7	1.1	-57.4	0.3	0.4	0.0	0.1	0.0	-0.1	0.3
2009	0.3	0.5	0.8	1.1	-63.7	0.3	0.5	0.0	0.1	0.0	-0.1	0.3
2010	0.3	0.6	0.9	1.2	-68.4	0.3	0.6	0.1	0.1	0.0	-0.1	0.4
2011	0.4	0.6	1.0	1.2	-72.1	0.4	0.8	0.2	0.1	0.0	-0.2	0.4
2012	0.5	0.7	1.1	1.3	-75.6	0.4	1.0	0.4	0.1	0.0	-0.2	0.5

Simulation 4

UK

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES (ex.MIPS)	SHORT-TERM INTEREST RATE (PTS)	EFFECTIVE EXCHANGE RATE	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.2	0.2	0.3	0.4	0.0	0.1	0.3	0.0	0.0	0.0	-0.1	0.1
2006	0.3	0.4	0.5	0.7	0.0	0.1	0.6	0.1	0.0	0.0	-0.1	0.1
2007	0.5	0.6	0.7	1.0	0.0	0.1	0.8	0.2	0.0	0.0	-0.1	0.2
2008	0.6	0.7	0.8	1.1	0.0	0.2	1.1	0.3	0.1	0.0	-0.2	0.2
2009	0.7	0.8	0.9	1.3	0.0	0.2	1.2	0.4	0.1	0.0	-0.2	0.2
2010	0.7	0.8	1.0	1.4	0.0	0.2	1.3	0.5	0.1	0.0	-0.2	0.3
2011	0.7	0.8	1.0	1.5	0.0	0.2	1.5	0.6	0.1	0.0	-0.2	0.3
2012	0.7	0.9	1.0	1.6	0.0	0.2	1.6	0.7	0.1	0.0	-0.2	0.3

SPAIN

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.1	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.1	0.1	0.2	-5.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.2	0.3	0.3	0.4	-11.2	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2006	0.4	0.5	0.5	0.7	-17.7	0.1	0.3	0.0	0.0	0.0	-0.2	0.1
2007	0.5	0.6	0.6	0.9	-20.8	0.1	0.4	0.0	0.0	0.0	-0.3	0.1
2008	0.7	0.8	0.8	1.1	-26.3	0.2	0.6	0.0	0.1	0.0	-0.3	0.2
2009	0.8	0.9	0.9	1.2	-31.2	0.2	0.8	0.2	0.1	0.0	-0.4	0.2
2010	1.0	1.1	1.0	1.4	-36.4	0.3	1.1	0.4	0.1	0.0	-0.4	0.3
2011	1.1	1.2	1.1	1.5	-42.0	0.3	1.5	0.7	0.1	0.0	-0.4	0.3
2012	1.2	1.2	1.2	1.5	-49.2	0.3	2.0	1.2	0.1	0.0	-0.4	0.1

NETHERLANDS

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.1	0.3	0.4	0.5	0.0	0.1	0.3	0.0	0.0	0.0	-0.1	0.1
2006	0.3	0.6	0.7	0.8	0.0	0.1	0.5	0.1	0.0	0.0	-0.1	0.1
2007	0.5	0.8	0.9	0.9	0.0	0.2	0.8	0.2	0.0	0.0	-0.2	0.2
2008	0.7	0.9	1.0	1.0	0.0	0.2	1.0	0.3	0.1	0.0	-0.3	0.2
2009	0.8	1.0	1.0	0.9	0.0	0.2	1.2	0.4	0.1	0.0	-0.4	0.2
2010	0.9	1.1	1.1	0.9	0.0	0.2	1.4	0.6	0.1	0.0	-0.4	0.2
2011	1.0	1.2	1.1	0.8	0.0	0.2	1.7	0.8	0.1	0.0	-0.5	0.2
2012	1.1	1.3	1.2	0.7	0.0	0.2	1.9	1.0	0.1	0.0	-0.6	0.2

BELGIUM .

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.1	-1.5	0.0	0.1	0.0	0.0	0.0	-0.1	0.0
2005	0.1	0.1	0.3	0.2	-3.7	0.1	0.2	0.1	0.0	0.0	-0.2	0.1
2006	0.3	0.2	0.4	0.4	-6.1	0.2	0.5	0.3	0.0	0.0	-0.4	0.2
2007	0.3	0.3	0.5	0.5	-7.6	0.2	0.8	0.5	0.0	0.0	-0.5	0.3
2008	0.4	0.3	0.4	0.4	-7.5	0.2	1.1	0.7	0.1	0.0	-0.6	0.3
2009	0.4	0.4	0.4	0.4	-6.8	0.2	1.2	0.7	0.1	0.0	-0.7	0.3
2010	0.5	0.5	0.3	0.3	-6.0	0.1	1.3	0.7	0.1	0.0	-0.8	0.3
2011	0.5	0.6	0.3	0.3	-5.9	0.1	1.5	0.7	0.1	0.0	-0.9	0.3
2012	0.6	0.7	0.3	0.3	-6.1	0.1	1.6	0.7	0.1	0.0	-1.0	0.4

Simulation 4

SWEDEN

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.1	0.2	0.3	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2005	0.2	0.3	0.4	0.6	0.0	0.1	0.3	0.1	0.0	0.0	-0.1	0.1
2006	0.4	0.5	0.6	0.9	0.0	0.2	0.6	0.3	0.0	0.0	-0.2	0.3
2007	0.6	0.6	0.7	1.0	0.0	0.3	1.0	0.5	0.0	0.0	-0.3	0.3
2008	0.7	0.6	0.7	0.9	0.0	0.3	1.3	0.9	0.1	0.0	-0.4	0.4
2009	0.7	0.6	0.6	0.7	0.0	0.3	1.6	1.1	0.1	0.0	-0.4	0.4
2010	0.7	0.7	0.6	0.7	0.0	0.3	1.8	1.1	0.1	0.0	-0.5	0.4
2011	0.7	0.8	0.7	0.9	0.0	0.3	1.8	1.1	0.1	0.0	-0.5	0.5
2012	0.8	1.0	0.8	1.1	0.0	0.4	2.0	1.1	0.1	0.0	-0.6	0.5

AUSTRIA

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.1	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.3	-1.7	0.0	0.1	0.0	0.0	0.0	-0.1	0.1
2005	0.1	0.2	0.3	0.8	-3.7	0.1	0.2	0.0	0.0	0.0	-0.2	0.2
2006	0.2	0.3	0.6	1.3	-5.6	0.1	0.4	-0.1	0.0	0.0	-0.3	0.3
2007	0.4	0.4	0.8	1.6	-6.5	0.2	0.6	0.0	0.0	0.0	-0.4	0.4
2008	0.5	0.5	0.9	1.8	-6.6	0.2	0.8	0.0	0.1	0.0	-0.4	0.4
2009	0.6	0.6	1.0	1.8	-6.3	0.1	1.0	0.2	0.1	0.0	-0.5	0.5
2010	0.6	0.6	1.0	1.8	-6.1	0.1	1.2	0.3	0.1	0.0	-0.5	0.5
2011	0.7	0.6	1.0	1.9	-5.5	0.1	1.4	0.5	0.1	0.0	-0.6	0.6
2012	0.7	0.6	1.1	2.0	-4.7	0.1	1.7	0.7	0.1	0.0	-0.3	0.6

GREECE

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.1	0.1	-0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.2	0.3	0.3	-4.9	0.1	0.1	0.0	0.0	0.0	-0.1	0.0
2005	0.4	0.5	0.7	0.8	-13.9	0.3	0.1	0.0	0.0	0.0	-0.1	-0.1
2006	0.8	1.0	1.2	1.4	-28.2	0.7	0.3	0.0	0.0	0.0	-0.2	-0.2
2007	1.2	1.4	1.7	1.8	-44.7	1.1	0.4	0.0	0.0	0.0	-0.2	-0.3
2008	1.6	1.8	2.0	2.1	-60.2	1.4	0.6	0.2	0.1	0.0	-0.3	-0.3
2009	1.8	1.9	2.1	2.1	-72.5	1.7	0.8	0.4	0.1	0.0	-0.3	-0.4
2010	2.0	1.9	1.9	2.0	-80.9	1.9	1.1	0.8	0.1	0.0	-0.3	-0.5
2011	1.9	1.8	1.7	1.7	-85.0	2.0	1.5	1.3	0.1	0.0	-0.3	-0.6
2012	3.1	3.8	2.0	2.2	-96.6	2.2	2.0	1.7	0.1	0.0	-0.5	-0.8

Simulation 4

DENMARK

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.2	0.2	-1.2	0.1	0.1	0.0	0.0	0.0	-0.1	0.1
2005	0.1	0.2	0.4	0.5	-2.8	0.1	0.3	0.0	0.0	0.0	-0.2	0.3
2006	0.3	0.4	0.8	0.9	-4.5	0.2	0.6	0.0	0.0	0.0	-0.3	0.5
2007	0.5	0.6	1.1	1.2	-5.8	0.3	0.9	0.0	0.0	0.0	-0.3	0.8
2008	0.7	0.9	1.3	1.3	-6.1	0.3	1.2	0.1	0.1	0.0	-0.4	1.0
2009	1.0	1.0	1.4	1.4	-5.5	0.2	1.4	0.2	0.1	0.0	-0.4	1.1
2010	1.1	1.2	1.5	1.5	-4.8	0.2	1.6	0.2	0.1	0.0	-0.4	1.1
2011	1.2	1.3	1.6	1.6	-4.4	0.2	1.6	0.2	0.1	0.0	-0.4	1.2
2012	1.3	1.5	1.8	1.8	-4.6	0.2	1.7	0.1	0.1	0.0	-0.4	1.3

FINLAND

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.1	0.1	0.2	-1.0	0.0	0.1	0.0	0.0	0.0	-0.1	0.0
2005	0.1	0.2	0.4	0.4	-2.6	0.1	0.2	0.0	0.0	0.0	-0.1	0.1
2006	0.3	0.5	0.7	0.8	-4.9	0.2	0.4	0.0	0.0	0.0	-0.1	0.3
2007	0.5	0.7	1.1	1.2	-6.9	0.3	0.6	-0.1	0.0	0.0	-0.1	0.4
2008	0.7	0.9	1.3	1.4	-8.3	0.3	0.7	-0.1	0.1	0.0	-0.1	0.5
2009	0.8	1.0	1.5	1.5	-9.4	0.4	0.8	-0.2	0.1	0.0	0.0	0.6
2010	0.9	1.0	1.7	1.6	-10.2	0.4	0.9	-0.2	0.1	0.0	0.0	0.7
2011	1.0	1.1	1.8	1.7	-10.9	0.4	0.9	-0.2	0.1	0.0	0.1	0.8
2012	1.0	1.1	1.9	1.8	-11.5	0.5	1.0	-0.3	0.1	0.0	0.1	0.9

IRELAND.

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE ($ PER PUNT)	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.1	0.1	0.1	0.2	-1.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
2005	0.2	0.2	0.3	0.4	-2.7	0.1	0.2	0.0	0.0	0.0	0.0	0.0
2006	0.3	0.4	0.6	0.7	-4.6	0.2	0.5	0.1	0.0	0.0	0.0	0.0
2007	0.5	0.5	0.8	0.9	-6.0	0.3	0.8	0.3	0.0	0.0	0.0	0.0
2008	0.6	0.6	0.9	1.0	-6.4	0.3	1.2	0.5	0.1	0.0	0.0	0.0
2009	0.7	0.6	0.9	1.0	-5.9	0.3	1.7	0.9	0.1	0.0	0.0	-0.1
2010	0.8	0.6	0.8	0.9	-4.7	0.2	2.2	1.4	0.1	0.0	0.0	-0.2
2011	0.8	0.6	0.7	0.9	-3.2	0.1	2.7	2.0	0.1	0.0	0.0	-0.3
2012	0.8	0.6	0.6	0.8	-1.4	0.1	3.4	2.6	0.1	0.0	-0.1	-0.4

PORTUGAL

(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND-ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM-PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP)	GOVERNMENT BALANCE (% OF GDP)
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.1	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.2	0.3	-3.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
2005	-0.1	-0.1	0.5	0.6	-7.2	0.1	0.1	0.1	0.0	0.0	0.0	0.2
2006	-0.1	-0.2	0.9	1.0	-12.0	0.2	0.3	0.1	0.0	0.0	0.0	0.3
2007	-0.2	-0.2	1.1	1.2	-15.4	0.3	0.4	0.1	0.0	0.0	0.1	0.4
2008	-0.2	-0.2	1.3	1.3	-16.5	0.3	0.6	0.2	0.1	0.0	0.1	0.4
2009	-0.1	-0.1	1.3	1.3	-16.2	0.3	0.8	0.4	0.1	0.0	0.1	0.4
2010	0.0	-0.1	1.3	1.3	-15.0	0.3	1.1	0.6	0.1	0.0	0.1	0.4
2011	0.1	0.0	1.2	1.2	-13.4	0.3	1.5	1.0	0.1	0.0	0.0	0.4
2012	0.2	0.1	1.1	1.1	-11.4	0.2	2.0	1.5	0.1	0.0	0.0	0.3

Annex 2 The User Cost Of Capital And Productivity

Introduction

Sections 3 and 4 of this report have shown how financial market integration across the EU might lower the cost of capital and, in Section 6, estimates of the likely macroeconomic impact of these changes were reported. As we noted earlier these estimates abstract from any dynamic effects that may boost productivity and output growth permanently. This Annex reviews how a reduction in the cost of capital may raise output growth and TFP growth.

Of interesting and, potentially important significance, is the potential that the reduction in the cost of capital may stimulate productivity growth, as well as affecting output growth by encouraging firms to increase investment and therefore capital input.

Researchers have hypothesised that total factor productivity growth and technical progress may be either "capital using" or "capital saving", which means that the rate of total factor productivity growth in the economy is increasing (decreasing) with decreases in the cost of capital. This could be due to a variety of factors, such as the presence of spillovers, interactions with scale economies, or learning by doing. The implication is that if productivity growth is capital saving, then the elasticity of total factor productivity growth with respect to the cost of capital may exceed the share of capital in the economy. Some estimates suggest that this is the case.

Background

The most recent economic research into technology and growth suggests that there are potential large interactions between capital investment and other factors such as learning by doing, technology diffusions and spillovers, and human capital investment—all of which contribute to output growth.

It is important at the outset to define output growth and TFP growth. Output growth can either be defined as the year-on-year change in EU-wide GDP, or alternatively, net national product (NNP). Net national product is consistent with "sustainable growth" since it subtracts out depreciation[91]. TFP growth can be defined alternatively as "costless" increases in output, i.e., output increases that do not use more inputs. It should be clear then, the distinction between output growth and TFP growth; TFP growth could manifest itself either as an increase in output or a reduction in total cost but reflects an increase in "potential output" if inputs and productive capacity is held fixed.

The lowering the cost of capital will have two primary effects, as follows:

1. An input substitution effect; where more capital input is employed due purely to the price effects.

2. A TFP effect; where the cost of capital impacts TFP growth:

- Directly to the extent that the expansion path of the economy's production is impacted by the cost of capital.

- Through the reallocation of goods and services across, nations, sectors, plants, etc, where "input price differentials" existed previously

- Through the embodiment of technology in new equipment, machines, and human capital.

91 Thus NNP accounts for situations where output growth abnormally runs down the capital stock of the country. This is consistent with a "Welfare-based" measure of TFP growth. See Weitzman (1976) or Gollop and Swinand (2001).

Approach To Measuring The Elasticity Of TFP With Respect To The Cost Of Capital

There are several approaches to measuring the elasticity of TFP with respect to the cost of capital. Which approach is "most" correct depends mostly on what restrictions one is willing to place on the production function of the economy.

The dual approach to TFP measurement is a useful starting point since we are interested in the interactions between TFP growth and the cost of capital. While the dual approach has typically used a cost function a simple dual approach to TFP calculation using a growth accounting framework, in case of one output and two inputs (K , L), TFP growth (dlnTFP/dt) can be calculated as follows:

Equation 1 $$\frac{d\ln TFP}{dt} = s_k \frac{\dot{R}}{R} + s_L \frac{\dot{w}}{w} - \frac{\dot{P}}{P}$$

where,

$s_K \equiv RK/Y$ denotes share of capital payment in total production;

R denotes the rental price of capital;

$\dot{R}/R$ denotes growth rate of R or dlnR/dt ;

$s_L \equiv wL/Y$ denotes share of labour payment in total production ;

w is the average wage rate;

$\dot{w}/w$ denotes growth rate of w , or dlnw/dt;

If the economy exhibits increasing returns to scale or other such properties such as learning by doing, then the simple growth accounting framework above may not hold exactly.

If the assumptions of constant returns to scale and no-spillovers are relaxed we must adopt a different methodology. An appropriate method is the econometric approach of estimating translog cost or production functions developed by D.W. Jorgenson and associates.

One such methodology which is flexible is to assume that TFP growth take the translog form. TFP is seen as the sum of scale economies and technical change. The dual (cost function) translog form of TFP growth, including the interactions between the cost of capital, *r*, and the scale of output, *Y*, and technical change, *t*, can be written as:

Equation 2:
$$TFP \equiv -\begin{bmatrix} \alpha_Y \ln Y + \gamma_{rY} \ln r \ln Y + \gamma_{YY} (\ln Y)^2 + \\ \alpha_t \ln t + \gamma_{rt} \ln r \ln t + \gamma_{tY} \ln t \ln Y + \gamma_{tt} (\ln t)^2 \end{bmatrix}$$

(where for simplicity we have ignored interactions with input prices other than the cost of capital.) Therefore, from Equation 2, it should be clear that the elasticity of TFP growth with respect to the cost of capital will depend critically on estimates of the second coefficient, γ_{rY} and the fifth γ_{rt} . These coefficient represents the interaction between technical change, t, and the cost of capital, r.

Empirical estimates of this parameter have been made in the economic research. Much of this research has been carried out by D.W. Jorgenson and co-authors.

A recent study by Lang (2002) of the impacts of R & D on TFP in Germany provides a rigorous investigation and estimation into decomposing the impacts of various factors and prices on output growth. Lang estimates γ_{rt} = 0.00028, and γ_{rY} = -0.0044. Lang's paper predicts that a 1% reduction in the cost of capital will result in a 0.00028 percentage reduction in cost through additional interactions between the cost of capital and technical change, independent of other factors, and that the interactions of scale economies with the cost of capital will tend to increase scale economies about 1% (using the elasticity of the cost function with respect to output, Y, as the definition of scale economies. When this equals 1, scale economies are zero. Empirical estimates are that values range from 0.93 to 0.99 for scale economies in the aggregate economy (Lang 2002).)

Nadiri and Mamuneas (1998) estimated a translog cost function for the US economy. They estimate the bias in TFP growth that interacts with the cost of capital to be 0.0002 – very much in line with Lang's estimates.

Re-Allocation Effects

Another way the cost of capital will affect TFP growth is through the re-allocation of economic activity among the several EU member states.

Productivity growth in the aggregate EU economy is equal to the weighted sum of the rates of productivity growth in individual the Member States[92]. If factor prices in all member states are equal, then the weights on the State-specific rates of productivity growth equal their share in the value of output and sum to one. If there are input price differentials across States, then there will be a differential between the weighted average of the rates of state-specific productivity growth and the aggregate rate of productivity growth.

In essence, when factor price differences persist across states, once can consider the production functions of the member states as distinct.

Following Ball et. al. (1999), the impact on aggregate TFP growth of the reallocation of capital across the Member States due to price convergence effects can be shown to be the sum over the j EU States' growth in capital times a differential factor:

Equation 3:
$$\left.\frac{d\ln TFP}{dt}\right| = \sum_j \frac{(r_j - r)}{P_j Y_j}\frac{d\ln K_j}{dt}$$

The differential between the cost of capital, r_j, in a specific member state and the aggregate cost of capital, r, is likely due to market imperfections, since competition should drive input prices to be equal.

Thus, to the extent that financial market integration increases capital's ability to move freely among the member states, and to the extent that this movement will drive down to zero any differences between the cost of capital across member states, there will be an aggregate TFP growth improvement in the EU economy.

The size of this effect has been studied at many levels of the economy in both the EU and the US. Jorgenson, Gollop and Fraumeni (..) estimated the effects of the reallocations of capital input across over 50 SIC industries in the US over the period 1943-79 added 0.0009 percentage points to the average rate of aggregate productivity growth over the period.

Reallocations across states can have big impacts for certain industries (consider bio-tech) and small impacts in others (agriculture, for example). Note that such reallocations can occur due to various factors, such as increased specialisation (e.g. with certain states adopting the more capital intensive industry) or within industry, say as one industry shifts production from one state to another.

[92] See Ball and al.

One important recent "empirical" fact that has surfaced in the economic literature on productivity using micro (firm level) data is that reallocations can have big impacts on productivity. Firm entry and exit are seen to have big impacts as well as reallocations within industries. Conversely, and puzzlingly, productivity differences across plants within firms tend to persist over time.

Conclusion

It is important to understand the different ways in which changes in the cost of capital will impact economic growth. Primarily, changes in the cost of capital will increase output by increasing investment. Some of this will come as a total increase in economic inputs and some of this will be via substitution of capital for other inputs.

An important mechanism by which economic activity increases is total factor productivity growth. Total factor productivity growth, perhaps the only "free lunch" in economics, means increasing output without increasing cost, or decreasing cost holding all else equal. Sources of total factor productivity growth are technical change, economies of scale and scope, and the reallocation of economic activity from low marginal product areas to higher marginal product areas.

In addition to these areas, there is a potential additional impact on economic growth through total factor productivity growth from reductions in the cost of capital. This is if TFP growth is "capital using", meaning the share elasticity of TFP growth is increasing as technology increases over time, or stated another way, the rate of technical change could be increasing with decreases in the cost of capital.

While the evidence is not yet overwhelming, some empirical evidence suggests that reductions in the cost of capital may have a positive impact on the rate of technical change and economies of scale. This means that, if anything, estimates of the impact of the cost of capital on the rate of TFP growth ignoring interactions between the cost of capital and technology advances and also economies of scale, could be biased downward.

Annex 3 London Economics-PwC Survey Questionnaire

The elimination of all barriers to full integration of European financial markets would, according to a number of observers, lead to a reduction in equity and corporate bond trading costs as a result of increased liquidity. In the following questions we will be asking you for your views on these issues.

1. Would you expect full European financial market integration to lower the following trading costs?

	Yes	**No**	**Don't know**
Brokerage commissions and other direct/explicit transaction costs	1	2	3
Bid-ask spread (implicit cost)	1	2	3
Adverse price impacts (costs incurred when trading a large quantity, which drives the price up when buying and down when selling) (implicit cost)	1	2	3
	If respondent answers yes to one or more go to Q2	If respondent answers No or D/k to all skip to Q3a	

2. By how much would you expect the above three types of trading costs would fall as a result of full integration of European financial markets? **(Only ask if respondent answered Yes to the same in Q1)**

	0-10%	**11-29%**	**30-49%**	**Over 50%**	**No change**	**Don't know**
Brokerage commissions and other direct transaction costs	1	2	3	4	5	6
Bid-ask spread	1	2	3	4	5	6
Adverse price impacts (costs incurred when trading a large quantity, which drives the price up when buying and down when selling)	1	2	3	4	5	6

3a. Would you expect average equity financing costs – as measured by equity yields - to decline as a result of full integration of European financial markets?

Yes	1	Go to Q3b
No	2	Skip to Q4a
Don't know	3	

3b. By how much would you expect average equity financing costs - as measured by equity yields - to decline as a result of full integration of European financial markets?

0-50 basis points	1
51-100 bps	2
101-150 bps	3
151-200 bps	4
Over 200 bps	5
Don't know	6

4a. Would you expect average bond financing costs – as measured by bond yields - to decline as a result of full integration of European financial markets?

Yes	1	Go to Q4b
No	2	Skip to Q5
Don't know	3	

4b. By how much would you expect average bond financing costs – as measured by bond yields - to decline as a result of full integration of European financial markets?

0-50 basis points	1
51-100 bps	2
101-150 bps	3
151-200 bps	4
Over 200 bps	5
Don't know	6

5. On a scale of 1 to 5 where 1 = **Not at all important** and 5 = **Very important,** how important to the market would be the following benefits of full integration of European financial markets? **(rotate start of options)**

Tick and rotate start	**Not at all important**	**Not really important**	**Neither/ nor**	**Quite important**	**Very important**	**Don't know**
Risk reduction for consumers and investors	1	2	3	4	5	6
Enhanced opportunities for diversification/portfolio choices	1	2	3	4	5	6
Increased liquidity	1	2	3	4	5	6
Lower cost of intermediation	1	2	3	4	5	6
Higher economies of scale/scope for financial services	1	2	3	4	5	6
Lower mark-up on services	1	2	3	4	5	6
Less financial constraints	1	2	3	4	5	6

6. On a scale of 1 to 5 where 1 = **Not at all likely** and 5 = **Very likely**, to what extent is financial integration in Europe likely to result in each of the following? **(rotate start of options)**

Tick and rotate start	**Not at all likely**	**Not really likely**	**Neither /nor**	**Quite likely**	**Very likely**	**Don't know**
Increased competition among exchanges	1	2	3	4	5	6
Increased competition among financial intermediaries	1	2	3	4	5	6
Lower costs due to economies of scale	1	2	3	4	5	6
Greater competition for banks and other more traditional sources of corporate finance	1	2	3	4	5	6
Improved price transparency	1	2	3	4	5	6
Increased market depth and lower liquidity risk	1	2	3	4	5	6
Larger markets for high risk capital such as venture capital	1	2	3	4	5	6

7. Finally can you state which of the following best describes your position? Would you say you are an……

- ❒ Institutional investor
- ❒ Stock market broker
- ❒ Market maker on a stock exchange
- ❒ European stock exchange employee
- ❒ Alternative trading systems operator (ATS)
- ❒ Other (please specify)

Annex 4 Detailed Survey Results

Table A4. 1: Survey of European Financial Market Participants - Views of Participants on Whether Full Integration of European Financial Markets Will Lower Market Trading Costs – Brokerage Commissions and Other Direct/Explicit Transaction Costs

Country/Response		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Yes	% within Country	70%	78%	79%	62%	69%	83%	73%
	% within Country	30%	22%	21%	35%	28%		26%
know	% within Country	-	-	-	3%	3%	-	2%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 2: Survey of European Financial Market Participants - Views of Participants on Whether Full Integration of European Financial Markets Will Lower Market Trading Costs – Bid-Ask Spreads

Country/Response		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Yes	% within Country	70%	67%	55%	62%	52%	64%	59%
No	% within Country		28%		35%	46%	28%	37%
Don't know	% within Country	10%	6%	-	3%		8%	4%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 3: Survey of European Financial Market Participants - Views of Participants on Whether Full Integration of European Financial Markets Will Lower Market Trading Costs – Adverse Price Impacts*

Country/Response		Country						Total
		France		Spain	Portugal	UK	Netherlands	
Yes	% within Country	45%	47%	42%		36%	56%	45%
No	% within Country	40%	24%	55%	41%	49%	28%	42%
know	% within Country	15%		3%		15%	17%	13%
	% within Country	100%		100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.
* Costs incurred where trading a large quantity drives the price up when buying and down when selling.

Table A4. 4: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Trading Costs – Expectations on Potential Decrease in Trading Costs – Brokerage Commissions and Other Direct/Explicit Transaction Costs

Expected % decrease/country		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
0-10%	Country	50%	39%	35%	33%	44%	43%	41%
11-29%	Country	29%	31%	31%	17%	33%	47%	33%
30-49%	Country	14%	23%	4%	-	9%	-	7%
Over 50%	% within Country	-	-	-	-	-	3%	1%
No change	% within Country	-	-	-		4%	-	2%
Don't know	% within Country	7%	8%	31%	44%	11%	7%	17%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 5: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Trading Costs – Expectations on Potential Decrease in Trading Costs – Bid-Ask Spreads

Expected % decrease/country		Country						Total
			Italy	Spain	Portugal	UK	Netherlands	
	% within Country	57%	42%	33%	39%	57%	52%	48%
11-29%	% within Country	21%	17%	11%	17%	26%	39%	23%
30-49%	% within Country	14%	8%	17%		3%	-	6%
No change	% within Country	-	-	-	6%	6%	-	3%
Don't know	% within Country	7%	33%	39%	39%	9%	9%	20%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 6: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Trading Costs – Expectations on Potential Decrease in Trading Costs – Adverse Price Impacts

Expected % decrease/country		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
0-10%	% within Country	44%	50%	50%	20%	50%	45%	43%
11-29%	% within Country	22%	38%	-	20%	17%	35%	21%
30-49%	% within Country	22%	-	14%	-	4%	-	6%
Over 50%	% within Country	-	-	-	13%	4%	-	3%
No change	% within Country	-	-	-	7%	8%	5%	4%
Don't know	% within Country	11%	13%	36%		17%	15%	22%
Total	% within Country	100%	100%	100%	100%	100%		100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 7: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Average Equity Financing Costs (as Measured by Equity Yields)

Expect average equity financing costs to decline as a result of full integration		Country						
		France	Italy	Spain	Portugal	UK	Netherlands	
Yes	% within Country	40%	57%	39%	45%	45%	61%	47%
No	% within Country	35%	36%	58%	41%	46%	33%	43%
Don't know	% within Country	25%	7%	3%	14%	9%	6%	10%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 8: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Average Equity Financing Costs (as Measured by Equity Yields) – Expected Fall in Equity Yields – Basis Points

Expected fall in equity yields		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
0-50 basis points	% within Country	50%	88%	54%	77%	73%	73%	70%
51 – 100 bps	% within Country	25%	13%	8%	-	7%	14%	10%
101 - 150 bps	% within Country	13%	-	8%	-	-	-	2%
Don't know	% within Country		-	31%	23%	20%	14%	18%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 9: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Average Bond Financing Costs (as Measured by Bond Yields)

Expect average bond financing costs to decline as a result of full integration		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Yes	% within Country	61%	44%	49%	31%	42%	58%	46%
No	% within Country	33%	39%		38%	28%	28%	33%
Don't know	% within Country	6%	17%	12%	31%	30%		21%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 10: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Average Bond Financing Costs (as Measured by Bond Yields) – Expected Fall in Bond Yields – Basis Points

Expected fall in bond yields		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
0-50 basis points	% within Country	55%	63%	69%	100%	75%	67%	71%
51 - 100 bps	% within Country	9%	25%		-	14%	24%	14%
101 - 150 bps	% within Country	27%	-	-	-	-	-	3%
Don't know	% within Country	9%	13%	25%	-	11%	10%	12%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 11: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Investors and Consumers – Risk Reduction for Consumers and Investors

Risk reduction for consumers and investors		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all important	% within Country	20%	6%	3%	7%	16%	6%	10%
Not really important	% within Country	10%	11%	21%	14%	21%	19%	18%
Neither/nor	% within Country	25%	22%	39%	28%	19%	19%	25%
Quite important	% within Country	35%	33%	15%	28%	27%	47%	30%
Very important	% within Country	5%	28%	18%	24%	15%	8%	16%
Don't know	% within Country	5%	-	3%	-	2%	-	2%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 12: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Investors and Consumers – Enhanced Opportunities for Diversification/Portfolio Choices

Enhanced Opportunities for Diversification/Portfolio Choices		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all important	% within Country	-	6%	-	3%	5%	-	3%
Not really important	% within Country	-	11%	9%	10%	12%	17%	11%
Neither/nor	% within Country	-	28%	12%	17%	15%	28%	17%
Quite important	% within Country	75%	33%	39%	38%	42%	44%	44%
Very important	% within Country	20%	22%	39%	28%	27%	11%	25%
Don't know	% within Country	5%		-	3%	-	-	1%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 13: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Investors and Consumers – Increased Liquidity

Increased Liquidity		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all important	% within Country	-	11%	-	3%	6%	3%	4%
Not really important	% within Country	15%	17%	12%	3%	9%	14%	11%
Neither/nor	% within Country	40%	17%	12%	21%	22%	17%	21%
Quite important	% within Country	25%	22%	49%	41%	43%	36%	39%
Very important	% within Country	20%	28%	27%	31%	19%	31%	25%
Don't know	% within Country	-	6%	-	-	-	-	1%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 14: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Investors and Consumers – Lower Cost of Intermediation

Lower Cost of Intermediation		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all important	% within Country	5%	11%	3%	7%	6%	6%	6%
Not really important	% within Country	30%	17%	21%	10%	19%	19%	19%
Neither/nor	% within Country	20%	22%	33%	31%	22%	22%	25%
Quite important	% within Country	35%	22%	24%	28%	37%	39%	33%
Very important	% within Country	10%	28%	15%	14%	13%	14%	15%
Don't know	% within Country	-		3%	10%	2%	-	3%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 15: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Investors and Consumers – Higher Economies of Scale/Scope for Financial Services

Higher Economies of Scale/Scope for Financial Services		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all important	% within Country	-	-	-	3%	8%	8%	4%
Not really important	% within Country	25%	11%	21%	17%	18%	14%	18%
Neither/nor	% within Country	25%	50%	36%		25%	31%	30%
Quite important	% within Country	50%	28%	27%	45%	33%	33%	35%
Very important	% within Country	-	11%	15%	7%	15%		11%
Don't know	% within Country	-	-	-	3%	2%	3%	2%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 16: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Investors and Consumers – Lower Mark-Up on Services

Lower Mark-Up on Services		France	Italy	Spain	Portugal	UK	Netherlands	Total
Not at all important	% within Country	-	6%	-	7%	9%	-	4%
Not really important	% within Country	30%	33%	27%	10%	22%	19%	23%
Neither/nor	% within Country	35%	39%	30%	41%	28%	44%	35%
Quite important	% within Country	25%	17%	33%	31%	22%	36%	28%
Very important	% within Country	10%	6%	3%	7%	15%	-	8%
Don't know	% within Country	-	-	6%		3%	-	3%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 17: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Investors and Consumers – Less Financial Constraints

Less Financial Constraints		Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all important	% within Country	10%	6%	3%	-		3%	5%
Not really important	% within Country	10%	6%	6%	17%	19%	8%	13%
Neither/nor	% within Country	30%	56%	33%	31%		25%	28%
Quite important	% within Country	30%	28%	30%	21%	30%	42%	31%
Very important	% within Country		6%	15%	7%	21%	14%	15%
Don't know	% within Country	5%	-	12%	24%	3%	8%	8%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 18: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Functioning of Financial Markets – Likelihood of Increased Competition Among Exchanges

Increased competition among exchanges	Country/ Response	Country						Total
		France	Italy		Portugal	UK	Netherlands	
Not at all likely	% within Country	-	6%	9%	7%	12%	3%	7%
Not really likely	% within Country	10%	6%	12%	21%	9%	17%	12%
Neither/nor	% within Country		28%	27%	14%	13%	8%	
Quite likely	% within Country	45%	22%	27%	31%	28%	28%	30%
Very likely	% within Country	35%	39%	24%	28%	37%	44%	35%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 19: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Functioning of Financial Markets – Likelihood of Increased Competition Among Financial Intermediaries

Increased competition among financial intermediaries	Country/ Response	Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all likely	% within Country		6%		7%	6%	-	4%
Not really likely	% within Country	-	17%	3%	-		6%	5%
Neither/nor	% within Country	15%	11%	21%	21%	24%	11%	19%
Quite likely	% within Country	65%	33%	39%	35%	39%	49%	42%
Very likely	% within Country	15%	28%	33%	38%	24%	34%	29%
Don't know	% within Country	-	6%	3%	-	-	-	1%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 20: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Functioning of Financial Markets – Lower Costs Due to Economies of Scale

Lower costs due to economies of scale	Country/ Response	Country						
		France	Italy		Portugal		Netherlands	
Not at all likely	% within Country		-	3%	7%	9%	6%	5%
Not really likely	% within Country	20%	33%	15%	7%	15%	11%	
Neither/nor	% within Country	40%	28%	39%	41%	19%	22%	
Quite likely	% within Country	30%	17%	39%	35%	39%	47%	
Very likely	% within Country	5%	22%	3%	10%	18%	14%	13%
Don't know	% within Country	5%	-	-	-	-	-	1%
Total	% within Country		100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 21: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Functioning of Financial Markets – Greater Competition for Banks and Other More Traditional Sources of Corporate Finance

Greater competition for banks and other more traditional sources of corporate finance	Country/ Response	Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all likely	% within Country	-	17%	3%	-	9%	3%	5%
Not really likely	% within Country	15%	11%	6%	7%	12%	17%	11%
	% within Country	10%	22%	30%	17%	22%	22%	22%
Quite likely	% within Country	45%	28%	42%	45%	34%	39%	38%
Very likely	% within Country	25%	22%	18%		21%	19%	22%
Don't know	% within Country	5%	-	-	-	2%	-	1%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 22: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Functioning of Financial Markets – Improved Price Transparency

Improved price transparency	Country/ Response	Country						Total
		France	Italy	Spain	Portugal	UK		
Not at all likely	% within Country	-	6%	-	21%	10%	6%	8%
Not really likely	% within Country	-	17%	15%	7%	13%	11%	11%
Neither/nor	% within Country	45%	22%	36%	21%	31%	25%	30%
Quite likely	% within Country	45%	44%	27%	35%	30%	44%	36%
Very likely	% within Country	5%	11%	21%	17%	15%	14%	15%
Don't know	% within Country	5%	-	-	-	-	-	1%
Total	% within Country		100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 23: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Functioning of Financial Markets – Increased Market Depth and Lower Liquidity Risk

market depth and lower liquidity risk	Country/ Response	Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all likely	% within Country		-	6%	10%	12%		8%
Not really likely	% within Country	20%	22%	9%	3%	18%	6%	13%
Neither/nor	% within Country	30%	33%	21%	17%	25%	25%	25%
Quite likely	% within Country	50%	28%	42%	52%	28%	42%	38%
Very likely	% within Country	-	17%	21%	14%	16%	19%	
Don't know	% within Country	-	-	-	3%	-	-	1%
Total	% within Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.

Table A4. 24: Survey of European Financial Market Participants - Views of Participants on Impact of Full European Financial Market Integration on Functioning of Financial Markets – Larger Markets for High Risk Capital Such as Venture Capital

Larger markets for high risk capital such as venture capital	Country/ Response	Country						Total
		France	Italy	Spain	Portugal	UK	Netherlands	
Not at all likely	% within Country	-	-	3%	3%	9%	3%	4%
Not really likely	% within Country	20%	6%	15%	24%	24%	14%	19%
Neither/nor	% within Country	35%	44%	42%	24%	19%	31%	30%
Quite likely	% within Country	30%	39%	27%	24%	31%	42%	32%
Very likely	% within Country	10%	11%	12%	17%	12%	11%	
Don't know	% within Country	5%	-	-	7%	5%	-	3%
Total	Country	100%	100%	100%	100%	100%	100%	100%

Source: PricewaterhouseCoopers/London Economics Survey of European Financial Market Participants, May 2002.