

# EMU and business sectors

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EMU study



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# EMU and business sectors

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

This study has benefited from comments and analytical inputs from Department of Trade and Industry officials; and from review by Dr Martin Baily, working in a personal capacity as an academic consultant to HM Treasury. Professor Tony Venables provided advice on theory as part of work as a consultant to HM Treasury up to spring 2002. All content, conclusions, errors and omissions in this study are, however, the responsibility of HM Treasury alone.

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

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

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# EXECUTIVE SUMMARY

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**Key issue: EMU and business sectors** **1** A key consideration in determining whether it would be in the UK's economic interest to join Economic and Monetary Union (EMU) is the impact of membership on UK business sectors. To what extent might EMU entry help, hinder or reshape the UK's industrial performance, and how might this impact be distributed across different UK industries and over different time periods?

**2** Entry into EMU would offer UK industry potential opportunities as well as challenges. The removal of the exchange rate between the UK and the euro area would reduce a barrier to doing business across a huge market. As a result, cross-border trade and investment between the UK and the euro area could rise. Over time, the level of competition in EU industry and markets might increase. Strong, competitive business sectors would prosper and find new opportunities to expand; weaker industries, however, would have to adapt to an environment of increased competition.

**3** EMU entry would also have important macroeconomic implications for UK industry. The loss of an independent monetary policy and nominal exchange rate flexibility would fundamentally alter the way in which the UK economy adjusts to economic change and unexpected disturbances. Much of this adjustment would take place through changes in the industrial environment.

**4** While this study takes into account these macroeconomic issues and their potentially important consequences for business sectors, its focus is on the microeconomic implications of EMU entry for UK business sectors. A standard result of economic theory is that the removal of a barrier to cross-border transactions usually enhances economic welfare. This means that the emphasis of this study is on the potential benefits of EMU. It is, however, important to recognise that these potential benefits would not be realised unless the UK had joined EMU on the basis of sustainable and durable convergence. If this were not achieved because, for example, the transition to membership required a significant change in the exchange rate or the interest rate, or because economic structures in the UK and the euro area were different, then EMU entry could lead to increased macroeconomic instability and, over the longer term, potentially lower output and employment.

**5** The study addresses five key questions:

- how do UK and EU industrial structures compare?
- what is the right framework for thinking about the potential microeconomic impact of EMU over the short, medium and long term?
- what has been EMU's impact to date on cross-border sectoral trade and investment; what is the potential effect on foreign direct investment (FDI) in particular, and what does this imply for the medium term?
- is there longer-term evidence that EMU may lead to increased competition or affect specialisation and concentration, and what does this imply for the incidence of shocks?
- in the future, what can be said about the way in which EMU might affect different industries, depending on specific sectoral characteristics?

**6** The baseline, or counterfactual, for this study – as for the other EMU studies and for the five tests assessment – is that, outside EMU, the UK would be a full and active member of the EU. This means that UK industry would have full access to the Single Market in goods and services and to EU capital markets, both now and in the future in an enlarged EU.

**7** The analysis in this study informs the investment test and the growth, stability and jobs test – the third and fifth of the Government’s five economic tests for EMU entry. It also complements the analysis in several of the EMU studies by HM Treasury which focus on the potential microeconomic impact of EMU, such as *EMU and trade*, *Prices and EMU* and *EMU and the cost of capital*. The potential costs of adjustment in EMU are the subject of the EMU studies *Modelling shocks and adjustment mechanisms in EMU* and *The exchange rate and macroeconomic adjustment*.

**The context: UK and EU industry structures** **8** When addressing these issues, it is important to understand how the UK’s industrial structure compares with that of countries in the euro area:

- the UK displays **similarities** in a number of respects. Manufacturing in both the UK and the rest of the EU has declined in relative importance and services have increased. Germany remains an outlier insofar as its manufacturing sector is still relatively large. UK trade with non-EU regions has fallen markedly over time as a proportion of total trade, and integration in goods trade with the EU is now comparable with Germany and other large EU countries; but
- there remain important **differences**. Services account for a higher proportion of total trade in the UK, due in part to the more prominent UK financial services sector. Although some countries have begun to catch up in recent years, the UK has historically received larger amounts of FDI than other EU countries, especially from the US, and continued to do so in 2001.

**9** These similarities and differences would play an important role in determining the impact of EMU on UK business sectors. For example, the UK’s relatively large service sector and its high level of service sector trade with non-EU countries may mean the UK has a different response to an EU-wide shock.

**EMU’s impact in theory** **10** The analysis of how the single currency might affect the supply-side conditions faced by UK business sectors is set within a dynamic framework of immediate, short to medium-term and longer-term effects:

- **immediate effects**. The immediate impacts of joining a single currency include the removal of currency conversion costs, reduced exchange rate volatility within the euro area, greater price transparency and the introduction of one-off changeover costs;
- **short to medium-term effects**. Stemming from the entry effects, these are potentially increased cross-border trade, potentially increased investment and changes to the mechanisms for economic adjustment; and
- **longer-term effects**. Over the longer term, EMU could potentially promote competition and influence trends in concentration and specialisation.

**The evidence on short to medium-term effects** **11** The operation of EMU to date provides a narrow but informative evidence base on the potential short to medium-term effects of EMU on cross-border trade and investment, and in particular on FDI. Positive effects on **cross-border trade** at an aggregate level are broadly confirmed by analysis at a sectoral level. Data on **cross-border investment** seem to suggest significant changes in investment flows in recent years. There is evidence that the UK's share of inward investment from outside the EU has fallen relative to other EU members since the introduction of EMU. This must, however, be considered against a backdrop of factors such as the rapid global increase in FDI over the late 1990s, largely driven by increased merger and acquisition activity, and the sharp fall since 2000, as well as the UK's leading position within Europe in terms of inward investment. It is difficult to detect with any confidence a specific EMU effect.

**The evidence on longer-term effects** **12** A look back over recent decades leads to the following conclusions about the potential longer-term impact of EMU:

- the Single Market Programme (SMP) and US experience highlight increased **competition** as a key potential long-term implication of EMU. The SMP appears to have promoted price convergence through the 1990s. There is as yet little to indicate an additional EMU effect on competition over and above other effects;
- evidence drawn from the experiences of the US and the EU over recent decades implies that EMU will promote greater **specialisation**. However, as the EU remains less specialised than the US, it should be less vulnerable to asymmetric shocks stemming from industrial structure; and
- the evidence is inconclusive on geographical **concentration**, with manufacturing exhibiting strong sectoral variations. At the level of the overall economy, however, the expansion of the more dispersed services sector exerts a dampening influence on geographical concentration.

**Different impacts on different industries** **13** The nature and intensity of the effect of EMU on individual sectors and, therefore, on UK business if the UK were to join would vary with a range of different characteristics.

**14** Sectors which are highly **open** or **exchange rate sensitive** (for example, tourism) would be more affected by EMU than those which have smaller trading propensities, though the impact would vary depending on whether exposure or sensitivity was primarily to euro area or non-euro area currencies (machinery and equipment, and electrical and optical products are, for example, sensitive to both exchange rate volatility and US dollar-based competition).

**15** The impact of EMU membership would be influenced by **pricing behaviour**. EMU would be most likely to facilitate price convergence in sectors where products are differentiated, where prices are outside the range of large euro area members or where markets are not segmented by national preference or regulation. EMU would be unlikely to facilitate price convergence in sectors producing commodity goods (for example, steel), where prices are within the range of large euro area members (for example, food), which are segmented by national preference or regulation (for example, cars), or which have strong branding (for example, sports clothing).

**16** Different **market structures** imply different EMU impacts. Sectors where acquisition potential is high, or where customer arbitrage is feasible (for example, travel), would tend to be more affected. Sectors segmented by national tastes (for example, domestic electrical appliances), in which undifferentiated products are sold in a global marketplace (for example, steel) or where sunk costs are determined in part at a firm level (for example, R&D and advertising intensive sectors such as pharmaceuticals) would be less affected.

**17 Firm size** is an important characteristic. While the absolute cost savings generated by EMU would be greater for large firms, the benefits (and the increase in competition) would be relatively pronounced in sectors characterised by smaller firms (for example, the manufacturers of car components rather than finished cars). More integrated product and capital markets may, at the same time, facilitate the development of multinational enterprises.

**18** In terms of **finance and ownership**, enhanced capital market competition and integration would have a clear effect on sectors in which firms make extensive use of external funding (for example, telecommunications), operate in relatively new or specialised fields (for example, biotechnology), are able to absorb FDI (for example, machinery and equipment), form strategic alliances (for example, pharmaceuticals) or have separate managerial control and ownership.

**19** To the extent that the loss of an independent monetary policy implies greater **volatility of demand**, there may be a greater impact on sectors which have highly cyclical demand (e.g. consumer durables) or which find cyclicality to be particularly damaging (for example, commodity chemicals).

**Conclusions 20** A fully quantified cost-benefit analysis of the potential impact of EMU entry on individual UK business sectors is not feasible, for reasons of data availability, reliability and complexity. Nevertheless, a combination of theory, evidence, history and comparison allows an informed judgement to be reached as to the potential dynamic consequences of EMU membership for the UK industrial base, and the possible implications for different industry sectors. The effect of membership of EMU would have to be gauged relative to a changing and evolving EU industrial landscape. The push to complete the Single Market in goods and services and further integration of capital markets are key elements of this change. Against this backdrop, several conclusions can be drawn:

- the potential increase in competitive pressure generated by membership of EMU could occur through both product and capital markets. While open and exchange rate sensitive industries would feel the impact of EMU most directly, all sectors and firms – however domestic their focus – would be affected by improved access to capital which facilitated expansion and restructuring;
- increased competition would be of particular benefit in many service sectors which have, to date, been less exposed to the effects of the Single Market than the goods sector. Greater competition and openness would help to raise productivity (especially important in services which affect business competitiveness such as distribution or business services) and deliver substantial benefits to consumers;
- by removing a currency barrier to trade, and potentially improving access to funding, EMU membership should be of disproportionate benefit to small and medium-sized enterprises (albeit less so to micro-enterprises); and
- at the opposite end of the size spectrum, EMU could also facilitate the development of multinational enterprises. This could help to raise aggregate productivity.

**21** The potential increase in competition, trade and cross-border investment facilitated by EMU will help shape the euro area's industrial base and influence in the process the industrial structures of euro area trading partners and competitors. Irrespective of the UK's EMU decision, UK industries cannot avoid being affected by the euro, though the quantitative and qualitative effects and the adjustment costs will clearly differ. Inside or outside of EMU, its existence places an increased premium on the flexibility and resilience of UK firms, business sectors and the economy as a whole.

**22** Whether or not the UK joins EMU, the Government is committed to creating the best possible environment for enterprise and investment across all UK regions, sectors and industries. This is important for the Government's long-term economic goal of closing the productivity gap which exists between the UK and its major competitors. In an EU context, the Government is committed to the economic reform strategy agreed by EU Heads of Government or State at Lisbon in March 2000. The Government's vision is of a dynamic, job-creating EU characterised by full employment, high living standards and social cohesion. Challenging reforms of labour, product and capital markets are needed to achieve this goal.<sup>1</sup>

**23** The conclusions of this study are based on the assumption that if the UK were to join EMU, it would do so on the basis of sustainable and durable convergence. If this were not the case, UK business sectors would be faced with an environment of greater macroeconomic instability and, over the longer term, potentially lower output and employment than would otherwise be the case. These issues are considered further in the assessment of the five economic tests for EMU entry.

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<sup>1</sup> See *Meeting the Challenge: Economic Reform in Europe* (HM Treasury, 2003) for full details.



# INTRODUCTION

**I.1** A key consideration in determining whether or not it would be in the UK's economic interest to join Economic and Monetary Union (EMU) is the impact of membership on UK business sectors. This study considers the extent to which EMU entry might help, hinder or reshape the UK's industrial performance, and the distribution of this impact across different industries and over different time periods.

**I.2** The Treasury's 1997 assessment of the five economic tests (HM Treasury, 1997) noted that there were certain features of the UK business landscape that made it different from other EU countries, and that potentially made it susceptible to different types of shocks. The 1997 assessment also argued that EMU would potentially increase trade, investment and competition, but that these benefits would only be realised if the UK were to join EMU on the basis of sustainable and durable convergence.

**I.3** EMU entry would offer UK industry possible opportunities as well as challenges. The removal of the exchange rate between the UK and the euro area potentially reduces a barrier to doing business across a huge market. As a result, cross-border trade and investment between the UK and other euro area markets could rise and, over time, the level of competition in euro area industry and markets increase. Competition drives growth, productivity and job creation, and facilitates an efficient distribution of resources between enterprises and sectors. Strong, competitive business sectors would prosper within EMU and find new opportunities to expand; weaker industries, however, would have to adapt to an environment of increased competition.

**I.4** Whether or not the UK joins EMU, the Government is committed to creating the best possible environment for enterprise and investment across all UK regions, industries and sectors. This is important for the Government's long-term economic goal of closing the productivity gap which exists between the UK and its major competitors. In the EU context, the Government is committed to the economic reform strategy agreed by Heads of Government or State at Lisbon in March 2000. The Government's vision is of a dynamic, job-creating EU characterised by full employment, high living standards and social cohesion. Challenging reforms of labour, product and capital markets are needed to achieve this goal.<sup>1</sup>

**I.5** This study employs an analytical framework which divides EMU's microeconomic impact on business sectors into immediate, short to medium-term and longer-term effects. It considers evidence on the extent to which potential short to medium-term effects have been observed since the start of EMU. It uses evidence on the impact of the Single Market Programme (SMP) in the EU, as well as comparisons with the United States (US), to consider the potential long-term effects of EMU. The study then draws on both theory and evidence to consider the potential consequences of EMU entry for UK business sectors in a forward-looking context, depending on specific sector characteristics.

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<sup>1</sup> See *Meeting the Challenge: Economic Reform in Europe* (HM Treasury, 2003) for full details.

**Links to other studies** **1.6** This analysis draws on several other EMU studies by HM Treasury on the potential microeconomic impact of EMU: *Prices and EMU*, *EMU and trade* and *EMU and the cost of capital*. It also considers the macroeconomic implications of EMU for business sectors, drawing on the EMU studies *Modelling shocks and adjustment mechanisms in EMU* and *The exchange rate and macroeconomic adjustment*. However the main focus of the study is on the microeconomic impact of EMU for business.

**The analytical framework** **1.7** The study takes as its starting point the basic assumption of economic theory, which is also an assumption of Government policy towards EMU, that the removal of a barrier to cross-border transactions in principle enhances overall economic welfare. As noted above, the analytical framework of this study considers the microeconomic impact of EMU over three time frames: the immediate effects, short to medium-term effects and the longer-term effects.

**The evidence** **1.8** Recognising the potential effects of the euro is one thing, but identifying and quantifying their nature, magnitude and timing is quite another. Much of the economic literature on the sectoral impact of a single currency has a relatively short pedigree and empirical evidence in a European (and particularly EMU) context is, by definition, of an even more recent nature.

**1.9** To an extent, EMU affords a controlled experiment in that not all members of the EU Single Market have joined the single currency. This is, however, complicated by EMU being just one of many factors which have shaped the development and decisions of business sectors in recent years. EMU's impact is overlaid on (and potentially obscured by) the effects of other drivers shaping the European business landscape<sup>2</sup> such as: supply-side changes (for example, outsourcing and consolidation); financial innovation; a changing business environment, especially in terms of regulation; and globalisation. The regulatory, social and institutional environment will itself shape the way in which any EMU specific influences are felt.

**1.10** In an EU context, the business environment has also been influenced by the SMP and its associated increase in integration and competition, as well as by multilateral and bilateral initiatives to promote free trade. The SMP was agreed in principle in 1985 and was laid out formally in the Single European Act in 1986. Countries were required to remove intra-EU barriers in capital, product and labour markets by the end of 1992.

**1.11** EU enlargement constitutes a further change in the business environment, in a context of globalisation which allows shocks to be transmitted and trends established increasingly quickly at a global level.

**1.12** These developments provide the baseline against which this study considers the potential impact of the membership of EMU on business sectors.

<sup>2</sup> These drivers are discussed in more detail in the EMU study by HM Treasury *The location of financial activity and the euro*.

- Effect on sectors** **I.13** Adding to the difficulty of isolating EMU-specific effects is the fact that any effect will be felt by different sectors to different degrees at different times. The implementation of the SMP demonstrated the extent to which industry response times to changes in their operating environment can vary. Differences in reaction times may themselves affect the dynamics of industrial change, complicating *ex ante* analysis of any specific event; a key reason why the SMP merits particular attention in a study of this nature.
- I.14** The way in which UK membership of EMU would affect any particular sector will vary with sectoral and industry characteristics. This study focuses on six characteristics of particular relevance: openness and exchange rate sensitivity, pricing behaviour, market structure, firm size, financing and ownership, and cyclicity.
- I.15** Depending on their combination of characteristics, some sectors and firms would be relatively insulated from, and others more exposed to, the various effects of EMU.
- What the study does and does not do** **I.16** The approach taken by this study is not in itself unique. The study does, however, go further than other assessments in attempting to approach these issues in a systematic way and from an explicitly UK perspective. Its use of immediate, short to medium-term and longer-term time frames reflects the nature of the UK decision at the present time; the need to take full account of both the evidence of EMU's operation to date and the potential for dynamic change in the future. The study does not provide a detailed, disaggregated sector-by-sector analysis, but provides a rigorous analysis of the ways in which industries with different characteristics would be affected by EMU.
- The structure of the study** **I.17** **Section 2** sets the scene for the study as a whole, with a broad overview of the industrial structures of the UK and the EU economies to address the issue of how they compare.
- I.18** **Section 3** forms the analytical core of the study. Drawing on economic theory, it considers how the single currency might affect the supply-side conditions faced by business sectors over the short, medium and long run. It considers the potential impact of the euro on trade and investment, the costs and benefits of adjusting to the new operating environment and the longer-term consequences for competition, specialisation and concentration.
- I.19** **Section 4** explores the extent to which a 'euro effect' is observable in practice. With only at most four years' data to draw on, the focus is on changes in cross-border trade and investment and includes a full analysis of the recent trends in **foreign direct investment**. The section also looks back to the experience of the SMP which represented a shift in the European competitive environment and provides useful insights for any further change generated by the single currency.
- I.20** **Section 5** considers longer-term issues. EMU was launched in a Europe already being reshaped by global, sectoral and secular shifts in competition, specialisation and concentration. Drawing again on the experience of the SMP, this section looks at how EMU might reinforce, redirect or offset these underlying trends.
- I.21** **Section 6** combines the theoretical and empirical aspects of the preceding analysis to focus on the potential consequences of EMU entry for UK sectors in a forward-looking context, depending on specific sectoral characteristics. **Section 7** concludes.



# 2

## COMPARING THE INDUSTRIAL STRUCTURES OF THE UK AND THE EU

The UK's industrial structure is similar in many respects to that of the EU as a whole, though not necessarily to that of individual Member States. The UK's output and employment structures are, for example, similar to those of France, but different to Germany due to Germany's still large manufacturing sector. UK trade with non-EU countries has fallen markedly over time as a proportion of total trade, and integration in goods trade with the EU is now comparable to that of other large Member States.

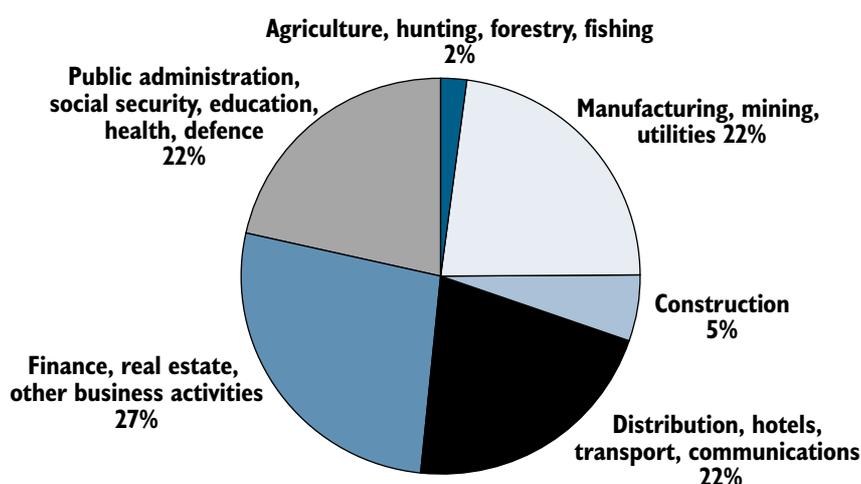
There remain, however, important differences. More UK workers are employed in large firms than is the case in the EU as a whole, and UK firms are more accustomed to raising external funding directly from equity markets. Services account for a higher proportion of UK trade, due in part to the invisible earnings of international wholesale financial services located in London. The UK has also historically received a larger amount of FDI than other EU countries, especially from the US.

**2.1** This section sets the context for the theoretical and evidence-based analysis that follows, by outlining the key characteristics of the UK and EU industrial structures. Where appropriate, it also refers to a long-standing currency union, the US, as indicative of how the EU economy might develop as the Single Market is completed and as the full effects of the single currency are felt. Comparison is made between the UK and the EU in several respects:

- the composition of output;
- the composition of employment;
- the composition and direction of trade;
- the level and pattern of investment;
- foreign direct investment (FDI);
- relative firm size and ownership; and
- productivity.

### Output

**2.2** The share of manufacturing in total output and employment peaked in most developed countries in the 1960s or 1970s. There has been a subsequent shift towards service sector output in recent decades. Chart 2.1 provides a snapshot of the sectoral composition of EU gross value added (GVA) in 2001. The only two sectors in the chart to report a rising share of GVA in the 1990s, were 'finance, real estate and other business activities' and 'distribution, hotels, transport and communications'. Services accounted for virtually all of the EU net job creation in the latter part of the 1990s. Table C1 in Annex C presents data on the contribution of individual sectors to gross domestic product (GDP) in the UK, France, Germany, Italy, Japan and the US.

**Chart 2.1: Sector contributions to EU GVA, 2001**

Source: Eurostat.

**GVA and GDP** 2.3 Many of the charts and tables in this section refer to industry contributions to, or shares of, GVA rather than GDP. GVA corresponds to the difference between the value of what is produced and the inputs consumed in production, and gives a more comparable measure of the composition of industrial output across different economies. GVA measures the contribution to the economy of each individual producer, industry or sector, and is used in the estimation of GDP. The link between GVA and GDP is that GVA measured at 'basic prices' plus taxes on products less subsidies on products equals GDP at market prices.

2.4 Table 2.1 summarises the main differences in the composition of output between the UK, France and Germany. Compared with the UK and France, Germany has a larger manufacturing sector and a smaller services sector (although the differences are not great). However, similarities at this level may mask differences at more disaggregated levels. For example, 'finance, real estate and other business activities' account for a smaller proportion of GVA in the UK than in France and Germany. Within this, however, the share of financial intermediation is higher than in either Germany or France.

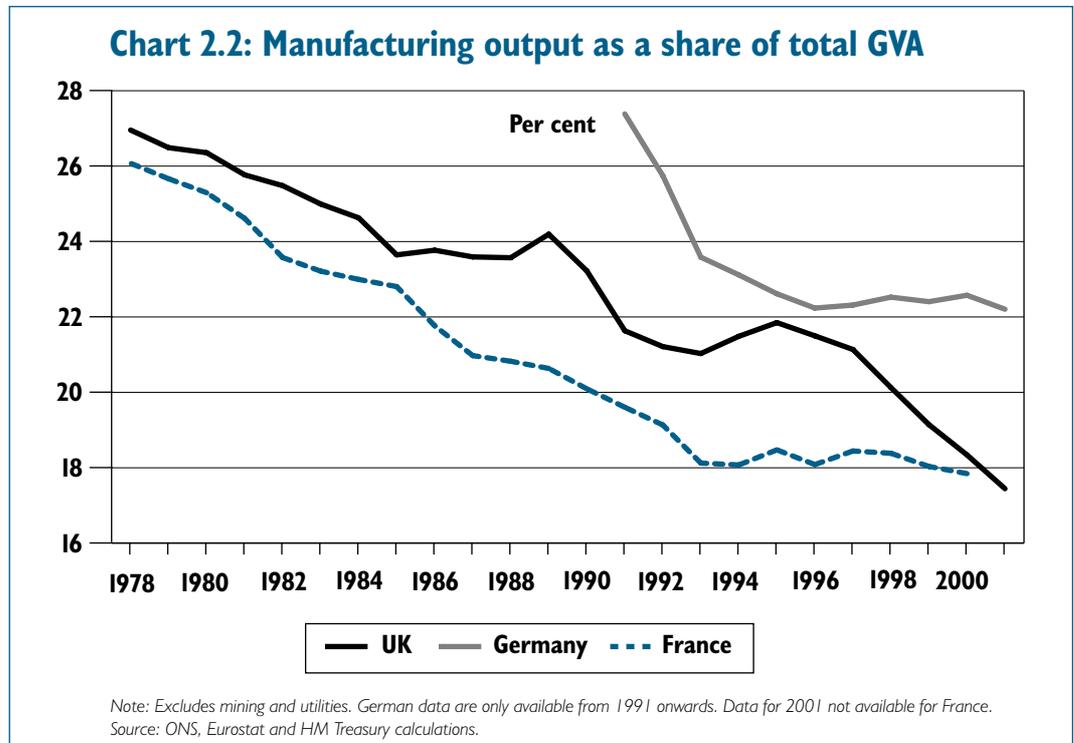
**Table 2.1: Sectoral share of GVA, 2001**

Per cent of total GVA	UK	Germany	France
Agriculture, hunting, forestry, fishing	0.9	1.2	2.8
Manufacturing, mining, utilities	21.1	24.4	20.1
Construction	5.1	4.8	4.7
Services total	72.1	69.7	72.4
Of which:			
Distribution, hotels, transport, communication	22.4	18.7	19.3
Finance, real estate, other business activities	27.8	29.7	30.1
Public administration, social security, education, health, defence	21.9	21.3	23.1

Source: Eurostat.

Note: Figures may not sum due to rounding.

**Manufacturing 2.5** The magnitude, pace and timing of the fall in manufacturing output as a share of total output has varied across EU countries. UK manufacturing output, for example, accounted for around 24 per cent of UK GVA in 1987, but had fallen to less than 18 per cent by 2001. In Germany, manufacturing's share of GVA fell from 27 per cent in 1991<sup>1</sup> to 22 per cent in 2001 (see Chart 2.2, which excludes mining and utilities).



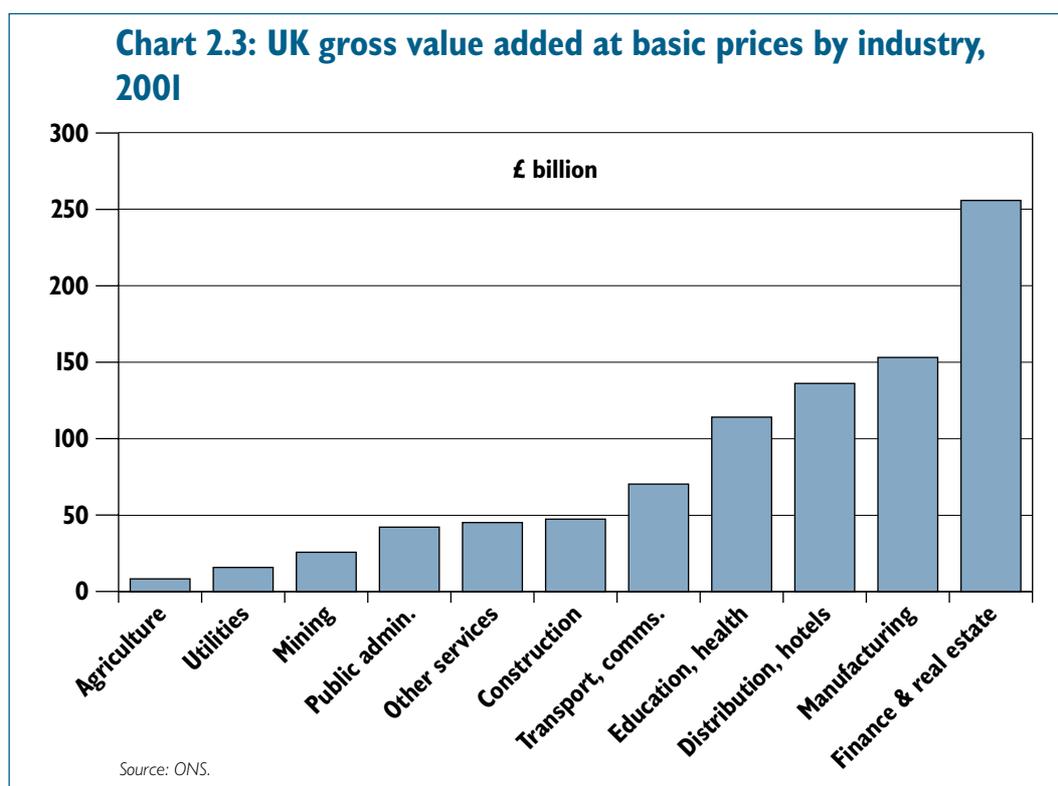
**2.6** The relative decline of manufacturing in the EU and the increase in the relative importance of the service sector reflects a combination of factors:

- manufacturers switching from in-house supply to outsourcing of external services, causing some functions previously classified as manufacturing (e.g. software design) to be classified as services;
- structural change in the EU economy favouring the service sector, with efficient organisation, high-technology skills and knowledge, innovation, brand creation and customised services featuring as sources of competitive advantage;
- increased intensity of global competition as a result of lower tariff barriers, reduced transport costs, improved communications and increased capital flows; and
- growing prosperity and consumers spending more of their rising incomes on services and proportionately lower amounts on less income elastic consumer goods.

<sup>1</sup> The earliest year of available data. All data from Eurostat.

**UK manufacturing 2.7** In the UK, as in the EU, manufacturing's share has fallen in terms of both total value added and employment. Manufacturing is, however, still a crucial sector, directly employing almost 4 million people and accounting for the majority of UK exports. In 2001, manufacturing was the second largest contributor to total output (£153 billion) out of eleven industrial sectors (see Chart 2.3).

**Government policy towards manufacturing 2.8** The Government has a comprehensive strategy for helping manufacturers fulfil their potential in the UK,<sup>2</sup> and has identified seven pillars for manufacturing success. These pillars will help to build a dynamic, knowledge-intensive, high-skilled manufacturing base and comprise: maintaining macroeconomic stability, increasing investment, raising science and innovation performance, adopting best practice, raising skills and education levels, a modern infrastructure and achieving the right market framework.



**Three large manufacturing sectors 2.9** At a disaggregated level, manufacturing in both the UK and EU is dominated by three large industries<sup>3</sup> (see Table C2 in Annex C for details):

- **chemicals**, which ranks as one of the top three industries in 11 Member States and first in three;
- **machinery and equipment**, which ranks as one of the top three industries in seven Member States and first in three; and
- **food and beverages**, which ranks as one of the top three industries in nine Member States and first in six.

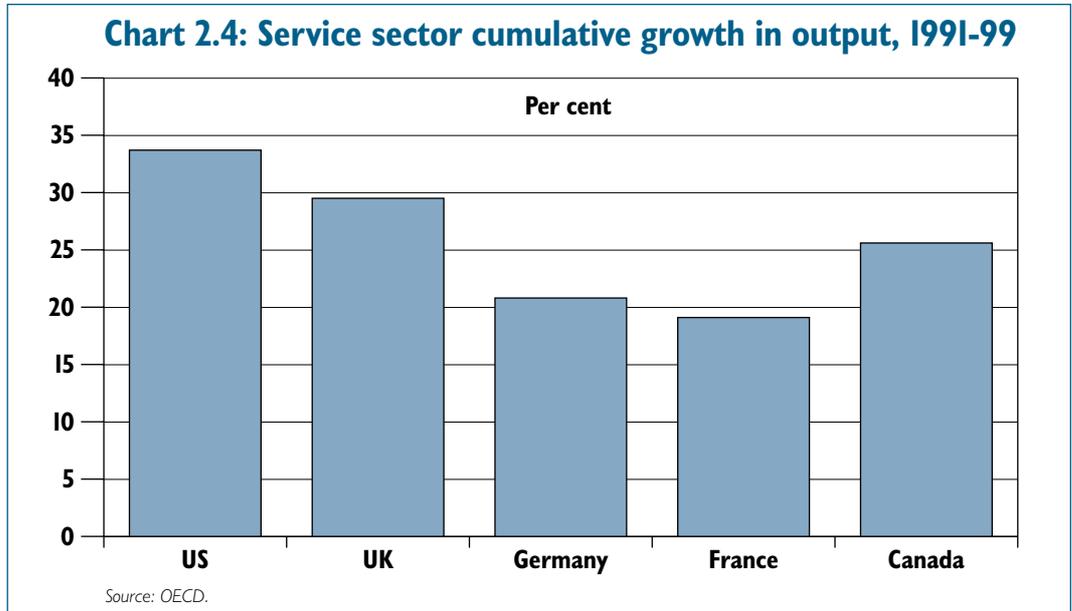
**Services 2.10** Services accounted for 72.1 per cent of the UK's gross value added in 2001; comparable with the EU average and slightly more than in Germany (69.7 per cent), although slightly less than in France (72.4 per cent). Professor Iain Begg, in his contribution to the EMU study *Submissions on EMU from leading academics*, states that the UK has been one of the most

<sup>2</sup> As set out in the Department of Trade and Industry (DTI) publication, *The Government's Manufacturing Strategy* (DTI, 2002).

<sup>3</sup> Eurostat.

successful Member States in the financial and business services industries. Financial intermediation accounted for 5.3 per cent of total GVA in the UK in 2001, compared with 4.2 per cent in Germany and 4.6 per cent in France.<sup>4</sup>

**2.11** Services in the UK have grown rapidly in recent years in comparison with other large economies (see Chart 2.4). Much of this increase can be accounted for by real estate and letting activity, which accounted for 17.4 per cent of UK GVA in 2001.

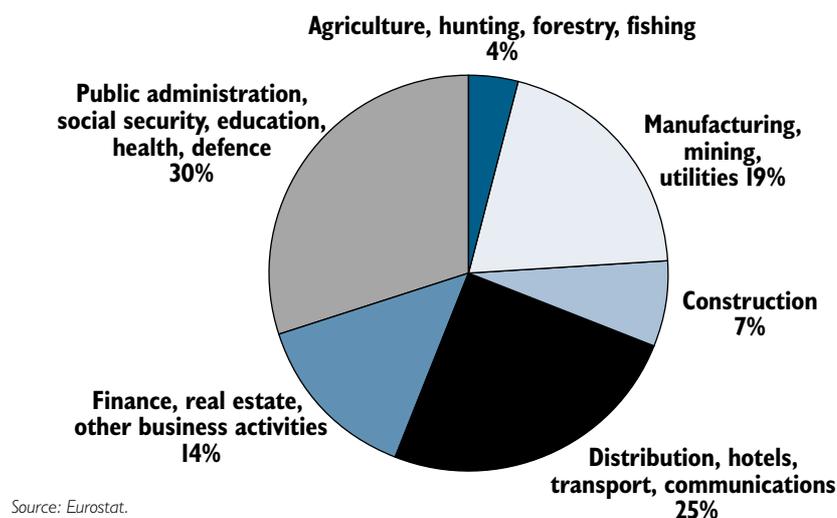


**A shift towards services** **2.12** Over the longer term, demographic and social trends imply an ongoing shift to services. Ageing populations and longer life spans suggest growing consumer demand for services; so, too, do a rising proportion of dual income, single parent and single person households.

## Employment

**2.13** Employment in manufacturing has fallen since the 1970s. Manufacturing now accounts for less than a fifth of total employment across the EU as a whole (see Chart 2.5). The distribution of employment by sector differs from that of output in that employment shares of both 'public administration, social security, education, health and defence' and 'distribution, hotels, transport and communications' are higher, and the share of 'financial, real estate and other business activities' is correspondingly lower.

<sup>4</sup> Eurostat; French data refer to 1999, the latest available year.

**Chart 2.5: Sector contributions to EU employment, 2000**

**2.14** A more disaggregated comparison by country (Table 2.2, which uses a different data source to Chart 2.5) reveals broad similarities across the three largest EU countries in terms of the composition of total employment, though distinct national differences remain:

- the share of agricultural employment in the UK is smaller than in France or Germany;
- employment in the manufacturing sector is significantly larger in Germany than in France or the UK; and
- compared with France and Germany, a relatively large share of UK employment is in the ‘hotels and restaurant’, ‘real estate, renting, and business activity’, ‘transport, storage and communication’, ‘education’, ‘health and social work’, ‘wholesale, retail trade and vehicle repair’, and ‘financial intermediation’ sectors.

**Table 2.2: Comparative employment structure, 2001**

Per cent of total employment	UK	Germany	France
Agriculture	1.3	2.5	4.0
Manufacturing	16.5	23.7	18.6
Construction	7.4	8.0	6.4
Wholesale, retail trade, vehicle repair	15.1	14.3	13.1
Hotels and restaurants	4.2	3.3	3.4
Transport, storage, communication	7.4	5.9	7.1
Financial intermediation	4.4	3.7	3.1
Real estate, renting, business activity	11.3	8.1	9.7
Public administration	6.7	8.2	9.2
Education	8.0	5.5	7.5
Health and social work	11.1	10.1	10.5
Other employment	6.3	6.6	5.4

Source: European Commission, DG Employment and Social Affairs, 2002.

**2.15** The breakdown of employment between the public and private sectors may also be relevant for assessing the implications of EMU entry. It is, however, difficult to find accurate and comparable data on public sector employment across countries. Table 2.2, for example, indicates employment in public administration, defence, social security, education, health and social work, but these categories include both public sector and private sector employees. The ONS estimate that UK employment in these categories is 23 per cent of total employment (compared to 26 per cent in the European Commission estimates in Table 2.2), and that actual public sector employment in the UK is 17.5 per cent of total employment (ONS, 2002).

## Trade

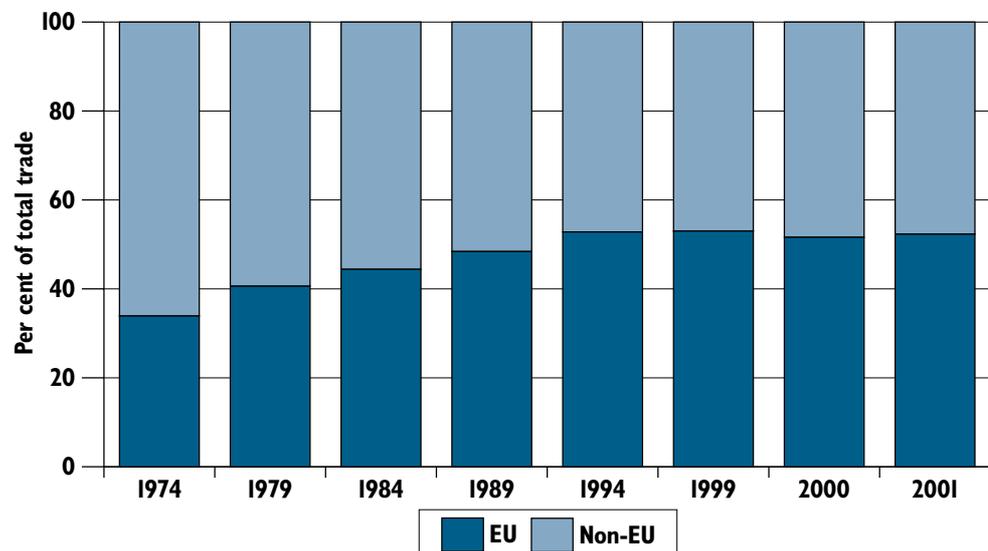
### A different picture for UK trade...

**2.16** The EMU study by HM Treasury *EMU and trade* looks in detail at the similarities and differences between the UK's trading patterns and those of other Member States. One of its key findings is the steady expansion in the EU's share of UK trade in goods and services from the 1960s through to the early 1990s (see Chart 2.6). Since the mid 1990s, however, that share has been steady at around 50 per cent of total UK trade.

**2.17** While the EU is the UK's primary trading partner, UK and EU trading patterns differ in several important respects. The main stylised facts established by the EMU study *EMU and trade* are:

- intra-EU trade accounted for around 60 per cent of the current account credits and debits of most large EU Member States in 2001. For some smaller countries, including Portugal and Belgium, the figure exceeded 70 per cent. The EU share of UK current account transactions in 2001 was around 50 per cent;
- only 40 per cent of the UK's services credits are from the EU. This reflects in part the importance of global business and financial services to the UK, as well as the large number of tourists who visit the UK from outside the EU;
- for most EU countries between half and two thirds of income credits and debits are connected with the EU; for the UK, the figure is around 40 per cent. The UK is a major recipient of inward investment from non-EU countries, especially the US. It is also a larger outward investor in non-EU countries than are most EU Members States; and
- compared with most large Member States, the UK trades more (relative to its GDP) in services.

**Chart 2.6: UK trade with the EU and the rest of the world**



Source: ONS and HM Treasury calculations.

**...but not necessarily differences which matter**

**2.18** As the EMU study *EMU and trade* also notes, however, the argument that the UK trades in a very different manner from comparable large EU countries is exaggerated. Certainly, with respect to trade in goods, the UK has greater ties to the US than do other EU countries. At the same time, however:

- there has been a great deal of convergence between the UK and other large EU countries. The relative importance to the UK of non-EU trade has fallen markedly over time and the share of goods trade with the EU is now in line with that in Germany and not far below the other large EU countries; and
- remaining divergences are concentrated on trade in services and income flows, where the EU share in UK trade in these current account components is well below the EU average. Nevertheless, given the greater importance of services trade to the UK, service exports from the UK to the EU are higher, as a proportion of GDP, than those of France, Germany or Italy.

## Investment

**Domestic investment**

**2.19** As with economic output, the composition of investment expenditure is broadly comparable across the UK, France and Germany (see Table 2.3). Two important differences are, however, that as a share of national gross fixed capital formation (GFCF), the UK has a relatively high share of investment spending in ‘metal products and machinery’ and a relatively low share of housing investment (see the EMU study by HM Treasury *Housing, consumption and EMU* for a discussion of the latter point).

**Table 2.3: Sectoral share of gross fixed capital formation (GFCF) expenditure, 2001**

Per cent of GFCF, current prices	UK	EU15	Germany	France
Agriculture	0.4	0.2	–	0.4
Metal products and machinery	37.5	30.1	30.6	26.6
Transport equipment	9.4	10.1	9.4	10.6
Construction: housing	16.7	23.7	31.5	20.8
Construction: other	26.6	25.1	22.8	23.9
Other GFCF	9.4	10.7	5.7	17.6

Source: Eurostat.

**2.20** Another notable difference is that, historically, UK private sector investment levels have been consistently below those of other economies, resulting in lower capital intensity. In 1999, the US and Germany had capital stocks nearly 50 percent higher than the UK, while France’s capital stock was 77 per cent higher (O’Mahony and de Boer, 2002).

**The recent weakness of UK business investment** **2.21** The UK has seen a substantial fall in business investment in 2002 reflecting the severity of the global economic slowdown in 2001 and 2002, which was concentrated in investment industries such as ICT, and uncertainty over the geopolitical situation.

**2.22** This has had a similar impact on investment and business confidence across industrialised countries, although the global slowdown in ICT seems to have had a particularly strong effect on UK business investment. However, business investment is historically cyclical and is equally likely to grow strongly when the world economic recovery gathers more momentum. The Government is committed to raising investment levels in the UK economy and is introducing targeted reforms to remedy market failures at the microeconomic level, while maintaining a stable macroeconomic environment to help business plan and undertake long-term investment projects.

### Foreign direct investment

**2.23** In 2001, the UK had the second largest stock of foreign direct investment (FDI)<sup>5</sup> in the world, lower only than the US, and equivalent to around one third of UK GDP (compared with less than a tenth in 1970). With stocks of almost \$500 billion, the UK held 19 per cent of the EU total. This compared with the second and third largest (Belgium and Luxembourg, and Germany respectively), both at 18 per cent of the total. Fourth largest was France, with 12 per cent.

**Source of FDI stocks** **2.24** The importance of FDI is discussed in more detail in Sections 3 and 4. Table 2.4 highlights the differences between FDI stocks in the UK and other EU countries at the end of 2000, the latest year for which disaggregated data are available. The primary difference stems from the UK's large proportion of US inward investment, and consequently higher share of non-EU FDI. Shares of FDI from Asia and Japan are, in contrast, much more similar across the UK, Germany, France and the EU as a whole.<sup>6</sup>

**Table 2.4 Source of inward investment stock, 2000**

Per cent of national total	UK	Germany	France	EU15
EU	47	74	71	67
Non-EU	53	26	29	33
of which:				
US	34	18	15	20
Asia	5	3	3	3
Japan	3	2	2	2
<b>Total (€ billion)</b>	<b>468</b>	<b>483</b>	<b>277</b>	<b>2,737</b>

*Source: Eurostat and HM Treasury calculations.*

<sup>5</sup> The International Monetary Fund defines FDI as an international investment aimed at establishing a lasting interest in an overseas enterprise. It implies a long-term relationship, and substantial investor influence on the way the enterprise is managed. Such an interest is statistically defined as owning 10 per cent or more of the ordinary shares or voting power on the board of directors or the equivalent for a non-incorporated enterprise.

<sup>6</sup> These stock shares represent cumulative investment flows that are not indicative of FDI inflows in any particular year.

**2.25** The first three columns of Table 2.5 show UK, French and German FDI stocks by sector as a share of total EU FDI. The UK has a large share of total EU FDI in ‘mining and quarrying’, ‘electricity, gas and water’, ‘hotels and restaurants’ and ‘transport, storage and communication’, reflecting its long history of attracting relatively large amounts of FDI in these sectors.

**2.26** The last three columns of Table 2.5 also show differences across the three largest EU members in their national stock of FDI in different sectors:

- a larger share of UK FDI stock is in ‘mining and quarrying’, than is the case in either France or Germany;
- a larger share of UK FDI stock than of German FDI stock is in manufacturing, but the UK share is comparable to that in France;
- a higher share of UK FDI stocks is accounted for by ‘transport, storage and communications’, and financial intermediation; and
- ‘real estate and business activities’ comprise a lower share of UK FDI stock than is the case in either France or Germany.

**Table 2.5: Stock of inward FDI by sector, 2000**

	Per cent of EU15 total <sup>1</sup>			Per cent of national total <sup>1</sup>		
	UK	Germany	France	UK	Germany	France
Total	17	18	10	100	100	100
Agriculture	12	12	10	–	–	–
Mining and quarrying	68	1	1	9	–	–
Manufacturing	14	6	8	24	10	24
Electricity, gas and water	48	2	6	4	–	1
Construction	14	3	2	–	–	–
Trade and repairs	21	12	10	10	6	8
Hotels and restaurants	41	5	4	2	–	–
Transport, storage and communication	44	2	2	19	1	1
Financial intermediation	22	8	10	21	7	16
Real estate, business activities	5	41	15	9	75	47

<sup>1</sup> Rounded to the nearest whole number.

– indicates less than 1 per cent.

Source: Eurostat.

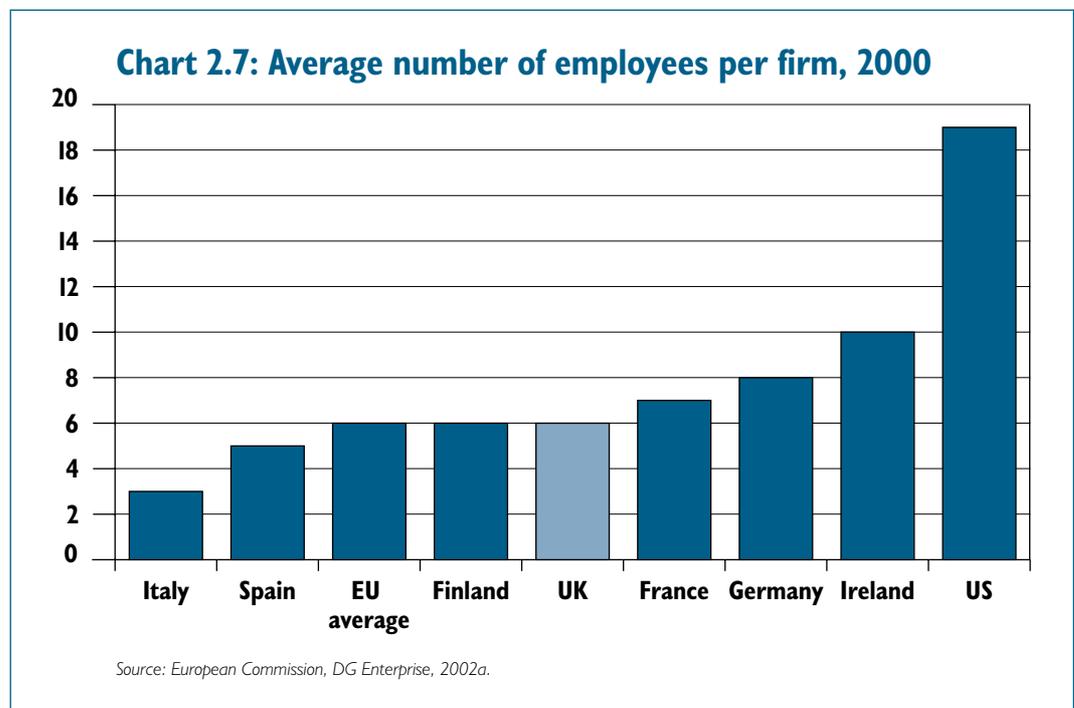
## Firm size and ownership

**The EU 2.27** The vast majority of EU businesses are small or medium-sized enterprises (SMEs).<sup>7</sup> SMEs represent about two thirds of European private non-primary sector employment, split roughly equally between micro enterprises employing less than 10 employees, and small and medium-sized enterprises of between 10 and 249 employees. Employment growth through the 1990s tended, in the US, to be stronger in large-scale enterprises than in SMEs; in Europe, the reverse was the case.<sup>8</sup>

**2.28** The importance of SMEs varies across Member States and sectors. They account for over 40 per cent of manufacturing value added in Italy and almost a third in Spain, but less than 10 per cent in Ireland. Across the EU as a whole their importance is particularly marked in the ‘food, beverages and tobacco’, in ‘textiles, clothing and footwear’ and ‘wood, paper, publishing and printing’ sectors.<sup>9</sup>

**The UK 2.29** Around 95 per cent of UK enterprises have less than 10 employees: these micro-enterprises account for around 30 per cent of UK employment (see Table C3 in Annex C). Within manufacturing, micro-enterprises account for 88 per cent of enterprises and 15 per cent of employment. Table C4 in Annex C provides a breakdown of the share of small enterprises in sector value added in the EU.

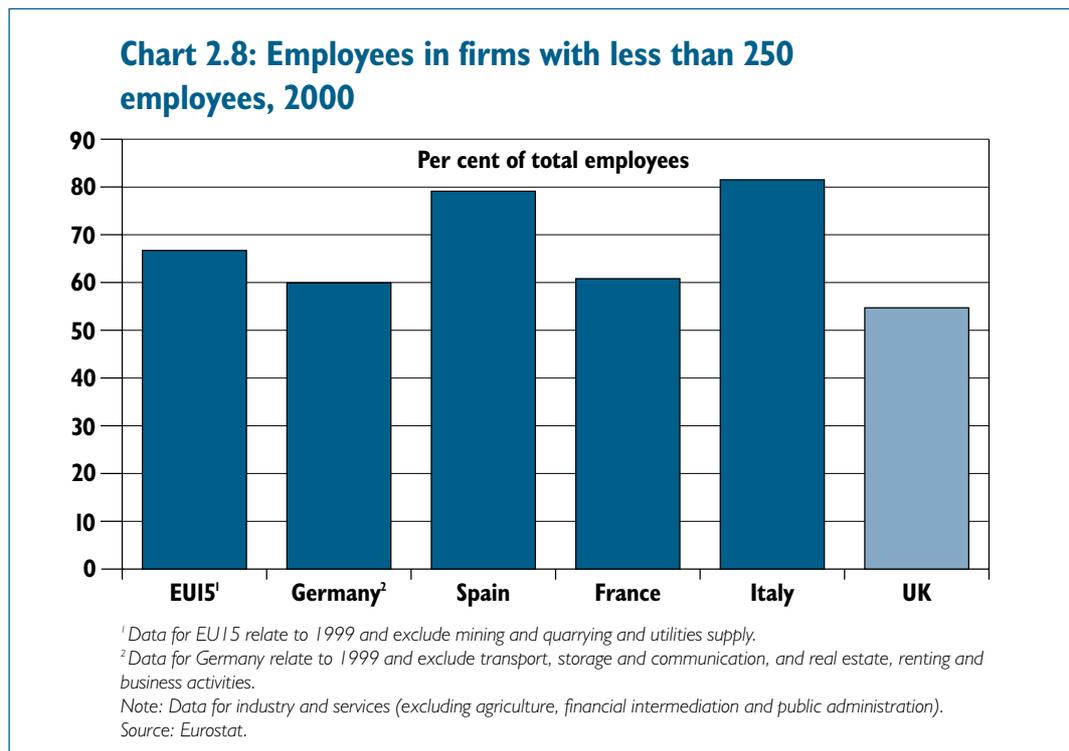
**2.30** The average number of employees per UK firm is comparable to the EU average, but lower than in France or Germany and significantly lower than in the US (Chart 2.7). A smaller proportion of employees, however, work in small firms in the UK, than is the case in the EU in general. As Chart 2.8 shows, around 55 per cent of UK employees work in SMEs, compared to figures of around 60 per cent and around 65 per cent for the EU as a whole.



<sup>7</sup> Defined as firms with less than 250 employees.

<sup>8</sup> European Commission, DG Enterprise (2002a).

<sup>9</sup> European Commission, DG Enterprise (2002a).



**SMEs and exports** **2.31** SMEs have a lower propensity to export than large companies, with only around a fifth engaging in export activity. On average, EU SMEs export 13 per cent of their turnover, compared with 21 per cent for larger-scale enterprises.<sup>10</sup> However, as SMEs frequently act as suppliers to larger companies, their indirect exports may also be significant.

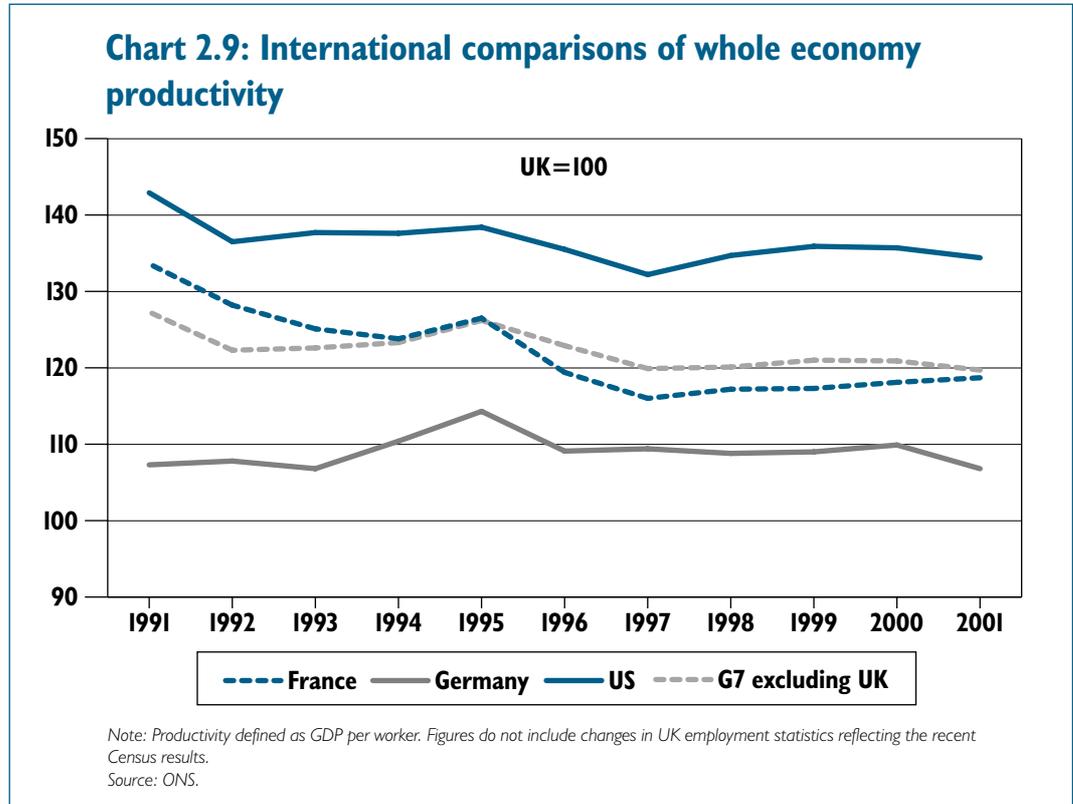
**Ownership** **2.32** UK industry typically has an equity-orientated external funding structure. This contrasts with the bank-based systems characteristic of many other Member States, where companies are likely to be more highly geared and have thinner equity bases. This contrast should not be exaggerated. Each country's system is, in reality, a mixture of both types of funding and is continually evolving. Nevertheless, different outcomes are evident. The UK's market-driven model facilitates restructuring via shareholder exit and a change of ownership to a greater extent than one which gives greater weight to 'relationship' funding via banks (see the EMU study by HM Treasury *EMU and the cost of capital* for a fuller discussion). Takeovers, and especially hostile takeovers, are a much more common means of corporate restructuring in the UK than elsewhere in the EU; a reflection in part of the size and regulatory structure of the London capital market, and the role of institutional investors.

## Productivity

**Productivity per worker** **2.33** The Government's long-term economic objective is that the UK should achieve a higher rate of productivity growth than its main competitors, closing the productivity gap. This is vital to delivering rising living standards and achieving the objectives of tackling poverty and improving public services. Gauging a country's productivity performance over time is, however, difficult; and comparing productivity across different countries is even more problematic. Different methodologies can produce very different results. The Government's usual measure is produced by the Office for National Statistics (ONS). However, official statistics available from the ONS only allow comparisons between countries at the whole economy level.

<sup>10</sup> European Commission, DG Enterprise (2002a).

**Productivity per worker** **2.34** Chart 2.9 shows GDP per worker over the past decade in France, Germany and, the US and for the G7 average (excluding the UK), relative to the UK. The substantial productivity gap between the UK and other G7 nations is striking, especially with respect to the US. The productivity gap has narrowed slightly over time, but remains substantial.



**Productivity per hour** **2.35** Output per hour is arguably a better measure of productivity than output per worker, because the former adjusts for the extent to which a difference in performance reflects the number of hours worked by employees. Even on this measure, ONS data<sup>11</sup> show that the UK still had a large productivity gap in 2001 with the US, Germany and France.

**2.36** Data difficulties notwithstanding, various academic studies have attempted to compare sectoral productivity across countries. Sector productivity data for the US, France and Germany, relative to the UK, produced by O'Mahony and de Boer (2002), are reproduced in Table 2.6. The UK has a marked productivity lead in mining (reflecting mainly the performance of its large oil and gas extraction sectors). The UK also leads individual countries in some sectors; the US and France in personal services, for example, or Germany in 'electricity, gas and water' and 'transport and communications'. Equally, however, the UK lags behind all three countries in a much larger number of sectors.

<sup>11</sup> Classified as experimental by the ONS.

**Table 2.6: Relative output per hour worked by sector, 1999**

UK= 100	US	Germany	France
Agriculture, forestry and fishing	189	51	104
Mining	78	20	43
Electricity, gas and water	157	65	114
Manufacturing	155	129	132
Construction	114	101	108
Transport and communication	113	88	101
Distributive trades	161	112	150
Financial and business services	153	161	126
Personal services	97	147	93
Non-market services	84	87	107

*Source: O'Mahoney and de Boer, 2002.*

## Conclusion

**2.37** While the UK is similar to the EU in a number of respects, it differs markedly in others. Box 2.1 highlights the key similarities and differences. However, the importance of these cannot properly be assessed within a static framework. The following sections of this study draw on these similarities and differences, and apply them in a dynamic and more forward-looking context to aid the analysis of the potential impact of EMU on UK business sectors over time.

<b>Box 2.1: Key similarities and differences between the UK and rest of the EU</b>		
	<b>Key UK and EU similarities</b>	<b>Key UK and EU differences</b>
<b>Output</b>	Declining relative importance of manufacturing; increasing relative importance of services.	UK growth of service sector output has been more rapid, especially in finance and other business services.
<b>Employment</b>	UK employment structure is broadly comparable with that of other large member states such as France.	Relatively high UK employment share in service sectors; a relatively low share in manufacturing (especially compared with Germany) and agriculture.
<b>Trade</b>	UK trade in goods is dominated by intra-EU trade.	A larger proportion of UK services and income flows represent extra-EU trade.
<b>Investment</b>	Composition of UK investment is broadly similar to the EU.	Relatively high proportion of investment spending on metal products and machinery, and less on housing.  Relatively low total investment as a per cent of GDP.
<b>FDI</b>	Share of UK FDI stock from Asia and Japan is similar to EU average.	The sectoral composition of the UK FDI stock differs in many respects from France and Germany.  A higher proportion of UK FDI stock is sourced from outside the EU.
<b>Firm size and ownership</b>	Average number of employees per firm is similar to the EU average.  The majority of enterprises are SMEs.	A larger proportion of UK employees work for large firms than is the case in the EU as a whole.  External financing is market based rather than bank based. Takeover is a much more common means of industrial restructuring.
<b>Productivity</b>	UK productivity gap with other G7 nations has narrowed slightly over time.	UK still has a substantial productivity gap with other G7 nations, and in a number of sectors.



The theoretical framework used in this study to examine the potential impact of EMU on business sectors distinguishes between the immediate effects, the short to medium-term effects and the longer-term effects.

The **immediate effects** of joining a single currency include the removal of conversion costs, reduced exchange rate volatility within the euro area, greater price transparency and one-off changeover costs.

These in turn spur the **short to medium-term effects** of potentially increased cross-border trade, increased investment and changes to the mechanisms for economic adjustment. There is a broad consensus in the economic literature that currency unions boost trade. The theoretical literature on the impact on investment is less clear-cut.

In the **longer term**, EMU potentially facilitates a more competitive environment and may impact on the existing trends of specialisation and concentration within the euro area.

The theoretical discussion highlights six key sector characteristics which would be expected to be important in determining the impact of EMU on business sectors: openness and exchange rate sensitivity, pricing behaviour, market structures, firm size, finance and ownership, and cyclical exposure.

**3.1** This section sets out a theoretical framework for considering the potential impact of EMU on business sectors. A key component of this framework is the division between immediate effects of entry, the short to medium-term effects and the long-term effects.

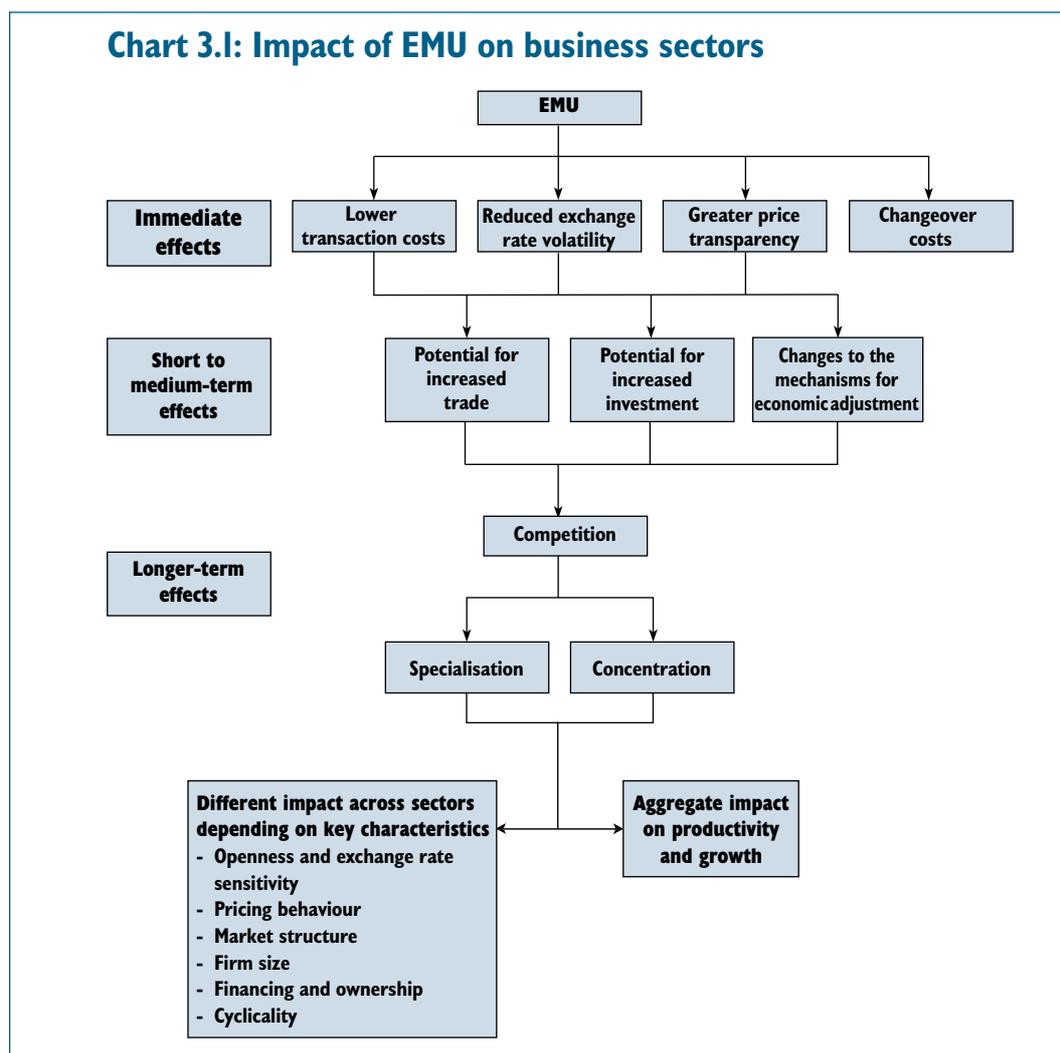
**3.2** Much of the existing research in this area has focused on the entry effects, which include the removal of exchange rate transaction costs, reduced exchange rate volatility and increased price transparency within a single currency area. These will create immediate one-off gains for business and consumers. However, the more significant effects may occur over longer time periods, as firms react to the entry effects by changing business strategies and, perhaps, increasing trade or investment. Over the long run, these changes may lead to greater integration of EU labour, product and capital markets, and increased competition. Such dynamic change offers potentially significant benefits in terms of increased productivity, lower prices and greater consumer choice.

**3.3** Three EMU studies by HM Treasury are particularly relevant to the analysis in this section: *EMU and trade*, *Prices and EMU* and *EMU and the cost of capital*. These studies consider the potential impact of EMU on the key microeconomic issues of trade, competition and investment at the aggregate level. This study brings this analysis together into an all-encompassing framework for considering the microeconomic impact of EMU on the business environment. It also extends the analysis in these aggregate-level microeconomic studies to focus on the sectoral level. Several EMU studies by HM Treasury consider the impact of EMU on the mechanisms through which an economy adjusts to shocks, for example *Modelling shocks and adjustment mechanisms in EMU* and *The exchange rate and macroeconomic adjustment*. While the focus of this study is on the microeconomic implications of EMU, these macroeconomic issues are also relevant.

**Outline of the theoretical framework** 3.4 Chart 3.1 summarises the immediate, short to medium-term, and long-term framework used throughout the study:

- the **immediate effects** of EMU entry on business are: the removal of exchange rate transaction costs within the euro area; the removal of intra-euro area exchange rate volatility; an increase in the transparency of prices across the euro area; and changeover costs in converting to the new currency. The first three of these immediate effects are analogous to the removal of barriers to cross-border transactions in the euro area;
- over the **short to medium-term**, theory would suggest that the removal of such barriers would promote trade and investment. The removal of an independent nominal exchange rate and monetary policy will also affect the way in which business adjusts to economic change and disturbances; and
- over the **longer-term**, an increase in cross-border trade and investment will lead to greater integration of the euro area market. This should promote increased product and capital market competition, induce price convergence and increase consumer choice driving productivity gains. As firms respond to the new operating environment, the industrial landscape will also change with respect to, for example, specialisation and concentration.

3.5 These different time frames are considered in more detail in the sections which follow. Box 3.1 provides an overview of the microeconomic theory of EMU.



**Box 3.1: The microeconomic theory of EMU**

To what extent would EMU membership benefit or hinder the performance of UK industry? Economic theory suggests two possible approaches to addressing this question:

- the theory of **optimal currency areas**; a currency union is more likely to be income-improving if the industry and trade structures of its members are similar. The less mobile labour and capital are, the more important differences in structure become; and
- the theory of **regional economic integration** which treats a single currency as a further integrating step.

Economic efficiency requires that the prices of goods and services accurately reflect both the value which consumers place on their consumption and the marginal cost of their production. Such a scenario is less likely when barriers at or inside national borders pose obstacles to search and exchange, create a wedge between domestic and import prices, and prevent fair and open competition.

Traditional analysis of cross-border trade views national currencies as an example of a non-tariff barrier. Reducing or removing any such barrier erodes the difference between domestic and import prices, exposes less efficient domestic producers to competition, and promotes integration of the economies concerned as trade expands.

This increase in trade is a function of the gains from specialisation and exchange based on comparative advantage. At a global level, and among the smaller EU economies, increased inter-industry trade suggests that this is, in fact, what has happened as trade barriers have been reduced. For the largest EU economies (Germany, UK, France and Italy), however, trade is almost entirely within rather than between industries; a problem for traditional trade theory to explain. Other features of the real world have also prompted revisions to thinking. Economies of scale challenged the assumption of constant returns, while the idea of perfect competition contrasted with the evidently imperfect competition prevailing in most markets.

Incorporating scale economies and imperfect competition into new trade theory results in greater consideration being given to the dynamic consequences of market size and to the rationale for investment in locations or sectors which might not coincide with what comparative advantage would suggest. It does not, however, affect the central role given to competition or the conclusion that a reduction in intra-EU trade barriers is beneficial for competitiveness and hence for economic performance.

## THE IMMEDIATE IMPACT OF EMU ENTRY

### Removal of transaction costs

**3.6** UK entry to EMU would remove exchange rate transaction costs on intra-EMU trade and investment. UK firms would no longer pay either the direct financial costs of exchanging currency or the in-house accounting costs of dealing with different currencies in the euro area. In 1990, the European Commission's *One Market, One Money*<sup>1</sup> study put the potential savings from removing transaction costs for the then European Community at between 0.1 per cent and 0.9 per cent of GDP. The range of savings varied quite widely across countries, with much smaller gains for large countries with widely traded currencies. Increased competition can be assumed to have pushed total costs down towards the lower end of this range by the time of EMU's launch.

<sup>1</sup> European Commission, DG Economic and Financial Affairs, 1990.

**3.7** Overall, the removal of transaction costs is not likely to represent a large saving for UK firms, though in proportionate terms it would be greater for small firms. The EMU study by HM Treasury *EMU and trade* outlines three reasons why small firms are likely to benefit to a greater extent than large firms from the removal of transaction costs:

- they may lack the relevant knowledge and expertise, and may not go to the best service provider;
- the size of deals they require may mean they have less negotiating leverage; and
- in forward transactions, they may be perceived as a worse credit risk than larger firms.

**Removal of  
exchange rate  
volatility**

**3.8** The removal of exchange rate volatility between the UK and the euro area may represent a more important saving for both large and small firms than the removal of transaction costs. At a macroeconomic level, variable exchange rates can be an important economic adjustment mechanism. Equally, however, exogenous movements in the exchange rate may act as a source of instability and an additional cost in cross-border transactions. The argument as to whether a flexible exchange rate constitutes primarily a useful adjustment mechanism or a source of instability is considered in detail in the EMU study by HM Treasury *The exchange rate and macroeconomic adjustment*.

**3.9** The argument that exchange rate volatility is a cost to cross-border transactions rests on the assumption that most short-term movements in the exchange rate are unexpected. Although industry has access to forward exchange markets which allow hedging against currency risk, these generally only cover the risk attached to short-term assets and liabilities, and even here may be too expensive or inaccessible for some firms (Friberg and Vredin, 1996). Persistent deviations of the exchange rate away from trend may also constrain cross-border transactions. Long-term hedging is more complicated than short-term hedging, requiring continual revision as expectations and conditions change, and is frequently problematic for industries with long lead times or high levels of inventories.

**3.10** Evidence suggests that large companies, especially in which production and revenues are spread across a number of countries, may view hedging as a reasonably expensive inconvenience rather than a major headache. Daimler Chrysler, for example, has put its annual post-EMU savings on currency hedging at €50 million; a substantial sum, though less so in the context of revenues of €150 billion (Financial Times, 2002a). For small companies, the costs in terms of money and time of undertaking hedging may be much greater and the fixed cost charged by banks for currency conversion on small transactions greater as a proportion of overall sales. Research by the Confederation of Finnish Industry and Employers (1998) found, for example, that currency hedging and conversion costs as a proportion of the overall value of the transaction, were higher for SMEs than for larger companies. It estimated the costs at around 1-2 per cent of the turnover of small firms.

**3.11** While hedging and conversion costs are often regarded as relatively small, they may be underestimated because surveys and analysis take into account only instances where firms found it worthwhile to engage in an international transaction. Many small firms may simply have found the exchange rate barrier too high to overcome and therefore stayed in the home market. The single currency might persuade some of these firms to enter overseas markets.

**Price transparency 3.12** A single currency makes it easier for consumers to compare prices across countries. Consumers should then find it easier to purchase the best value good from across the single currency area. This could promote increased trade and increase competitive pressures on firms, perhaps leading to narrower price differentials across countries. As the EMU study by HM Treasury *Prices and EMU* explains, the Internet may be an important catalyst for this process as it provides a platform through which consumers are able to compare prices across countries.

**Changeover costs 3.13** A changeover to the euro would inevitably have resource implications for UK firms. The experience of the euro area demonstrates that it is not possible to estimate accurately the costs of changeover and very few organisations have tried to do so either before or after the event. The cost for any particular organisation would depend on the specific approach taken. Furthermore, not all of the capital or IT costs incurred in the changeover can be attributed to the changeover; account must also be taken of normal cost replacement profiles.

**3.14** It is nevertheless important to understand the cost implications of differing approaches. The experience of the euro area shows that costs can be minimised through careful and early planning. Organisations can affect the resource impact of a changeover through:

- the timing of investment decisions;
- the extent to which euro compatibility is built in as part of ongoing work (for example, buying multi-currency financial systems or tills which are capable of dealing with more than one currency); and
- the level of euro services which are offered at key points during the transition period.

**3.15** These issues are covered in the assessment of the Government's five economic tests for EMU entry.

## THE SHORT TO MEDIUM-TERM IMPACT OF EMU

**3.16** The immediate effects of EMU entry would promote potentially important dynamic changes in the business landscape over the short to medium term. This section focuses on three key potential developments:

- an increase in trade;
- an increase in investment; and
- changes in the way in which the economy adjusts to economic disturbances.

**3.17** These effects are discussed below. In each case, the general expectations of theory at the macroeconomic level are considered and the important sectoral implications are highlighted.

### The potential impact of EMU on trade

**3.18** The theory of trade is discussed in detail in the EMU study by HM Treasury *EMU and trade*. It concludes that there are sound theoretical reasons for expecting the adoption of a single currency to lead to increased trade among the members of a single currency area. The removal of exchange rate volatility and exchange rate transaction costs constitutes a reduced barrier to trade which appears to have a greater positive effect in the case of a single currency than a fixed exchange rate system.

**Sectoral implications 3.19** There are a number of reasons why the impact of EMU on trade may vary across sectors. For example:

- the most immediate effect would be on firms in the tradeable sector. There would be an indirect impact on firms in the non-traded sector – firms which, for example, supply goods and services to exporters or purchase imported goods;
- Section 2 notes that firms which export tend to be larger firms in the manufacturing sector. Smaller businesses may be dissuaded from exporting by the assumption that hedging costs are prohibitive. For smaller firms, the removal of transaction costs and exchange rate volatility may be of proportionately greater benefit; and
- sectors where firms have a high degree of market power, perhaps because of strong product differentiation, may be less sensitive to price and exchange rate changes. Demand for homogeneous goods, in contrast, may be more price sensitive, meaning that EMU may have a greater effect on these sectors.

### The potential impact of EMU on investment

**3.20** The second potential effect of EMU over the short to medium term is an increase in cross-border investment. Investment is a key driver of productivity; one of the Government's five economic tests for EMU entry considers whether joining EMU would improve the conditions for firms making long-term decisions to invest in the UK. The analysis in this study provides important supporting material for the assessment of the investment test.

**3.21** The theory of investment is considered in detail in Annex A. This section summarises its primary conclusions, distinguishing between the impact on domestic business investment and that on foreign direct investment (FDI). FDI is distinct only in that the ownership of the investment is from a business overseas (see Box 4.2 in Section 4 for a detailed explanation of the definition of FDI). The determinants of both types of investment are very similar. A firm will invest if the expected returns from investment exceed the cost of investment. However, FDI flows may be especially affected by EMU, and in particular by the removal of the nominal exchange rate between the UK and the euro area. FDI is, for this reason, considered separately.

### Domestic business investment

**3.22** A central assumption of economic theory is that a firm will invest if the expected returns from the investment exceed the cost of capital. EMU may affect both sides of this relationship:

- reduced exchange rate volatility may affect expected returns for firms, especially those which trade with the euro area. The impact of EMU on domestic macroeconomic stability is also important; and
- reduced transaction costs and exchange rate volatility, and increased price transparency, could enhance integration in the UK and the euro area capital markets and thereby reduce the cost of capital.

**Expected returns 3.23** One of the most important recent developments in the literature on the economic drivers of investment has been the increased importance attached to **uncertainty**. Although its impact on investment is ambiguous in theory, empirical evidence largely supports the conclusion that uncertainty, including exchange rate uncertainty, reduces investment. EMU will affect uncertainty through its impact on macroeconomic stability. For UK firms,

exchange rate volatility with the euro area – one source of potential uncertainty – would be removed on entry. At the same time, however, domestic demand volatility might increase in EMU because the loss of an independent monetary policy removes one adjustment mechanism for dealing with economic shocks and disturbances. The nominal exchange rate is also a potentially important adjustment mechanism, so its loss could also increase output volatility.

**Cost of capital** **3.24** The EMU study by HM Treasury *EMU and the cost of capital* looks in detail at the composition of the cost of capital, which it breaks down into the credit risk-free rate and a market risk premium. UK entry into EMU would be unlikely to have a significant impact on the **credit risk-free rate**. This can be proxied as the rate of return on government bonds in major industrialised economies. After stripping out cyclical effects, UK government bond yields are very close to those of the euro area, reflecting the expectation that both the UK and euro area monetary policy regimes will maintain low and stable inflation. The **market risk** element of the cost of capital is the premium attached to investing in a particular firm or project rather than in a risk-free asset. If EMU entry were to result in UK firms gaining increased access to a large and integrated euro area financial market, this could result in a fall in the market risk premium. Recent work for the European Commission (London Economics, 2002) suggests that a potentially significant fall in the EU cost of capital could be achieved through full EU financial market integration.

**3.25** The removal of the currency barrier to raising funds in the euro area financial market would, in principle, be relatively more important for SMEs. In practice, SMEs tend to raise funds through local retail financial providers due to the importance that providers place on local knowledge of firms and economic conditions. However, EMU may over the long run promote greater competition in retail finance.

**Sectoral implications** **3.26** Business investment might, therefore, be increased by EMU entry in sectors which:

- are open to trade, since any increase in trade resulting from the single currency would be expected to induce increased investment. The reduction in exchange rate volatility on sales to the euro area would reduce uncertainty for exporters and importers;
- are characterised by relatively high levels of external financing. Firms in these sectors may be well-placed to exploit and benefit from any broadening and deepening of euro area capital markets, and easier and cheaper financing; or
- have a high proportion of SMEs (though not necessarily of micro-enterprises). EMU could increase the choice of funding sources for SMEs and promote greater competition in the market for bank lending in the longer term, although the overall impact would be constrained by the local nature of much small business financing.

## Foreign direct investment

**3.27** EMU may lead to changes in FDI flows into and out of the UK. The decision to invest overseas is affected by many factors. The UK's historically strong FDI performance is based on its attractive regulatory and tax regime, a stable macroeconomic environment, flexible labour and product markets, innovative capital markets, and a skilled labour force. Many of these factors would not be affected directly by EMU and EMU entry would not necessarily detract from the UK's excellent record in attracting FDI.

**FDI and the exchange rate** **3.28** A clear influence on FDI, and one which is relevant to the decision of whether or not to join the single currency, is, however, the exchange rate. The actual and expected level of the exchange rate is an important determinant of the decision to invest overseas. If firms are investing overseas in order to serve export markets, the exchange rate will affect the profitability of that project. Exchange rate movements also have implications for overseas investments targeting the host market, as earnings from foreign subsidiaries will at some stage need to be converted back into domestic currency. The discussion in Annex A suggests that:

- persistent deviations of the exchange rate from some measure of the long run or medium run equilibrium have a potentially important effect on FDI. A prolonged depreciation will increase FDI inflows, and a prolonged appreciation will decrease them; and
- exchange rate volatility (where a currency moves with high frequency around its short-run mean value) is found, in the economic literature, to have an ambiguous impact on FDI flows.

**Sectoral implications** **3.29** FDI is heterogeneous and subject to a variety of influences, and hence unlikely to behave uniformly in the face of exchange rate movements. It is more likely to be undertaken in sectors characterised by large firms and multinationals. Individual firms, however, choose to invest overseas for a number of reasons:

- market-seeking firms may choose to locate in a particular country to serve either the domestic market or to export to other countries;
- resource-seeking firms seek specific resources which are unavailable in the home country; and
- efficiency-seeking firms choose to locate in a country that allows them to produce more efficiently, perhaps because of the availability of more productive labour.

**3.30** These motives suggest that FDI can be broadly categorised as comprising two types, vertical and horizontal, which may be affected in different ways by EMU:

- vertical, where different stages of production are located in different countries and the location choice is more likely to reflect factor endowments; and
- horizontal, where similar final production activities are undertaken in different countries.

**3.31** This discussion suggests that firms investing overseas for different reasons will be affected in different ways by EMU. These issues are returned to in Section 4, where the evidence on the impact of EMU on FDI in the euro area is considered.

## The potential impact of EMU on the mechanisms of economic adjustment

**3.32** While EMU offers potential benefits over the short to medium-term, there are also potential short to medium-term costs. These potential costs are both structural and cyclical in nature.

**Structural adjustment 3.33** Changes in the industrial landscape, perhaps promoted by increased trade and investment, would involve potentially costly structural change. Firms would need to adapt to a more competitive environment; this may include the need to change marketing and trading strategies or to retrain their labour force. The trade and investment effects outlined above would not, in other words, occur seamlessly and without cost for the industrial sectors involved.

**Cyclical adjustment 3.34** There are also potentially important costs relating to changes in the mechanisms by which an economy adjusts to economic shocks inside a monetary union. An example would be if the UK were to experience a shock which reduced demand for its exports, due perhaps to a downturn in demand in one of its main export destinations. Outside EMU, the monetary policy authority might adjust interest rates to keep output close to trend, or the nominal exchange rate might depreciate, stimulating demand for UK exports.

**3.35** Inside EMU, these mechanisms would not be available to the same degree. Monetary policy would be set by the European Central Bank on the basis of euro area wide conditions, and the nominal exchange rate would be shared across the euro area. This would place the burden of adjustment to shocks on alternative mechanisms such as relative wage and price changes. To boost demand for exports in the face of such a shock without a nominal exchange rate depreciation, UK wages and prices would have to fall relative to those in other countries. This type of wage and price adjustment might take longer to return output to trend than a nominal exchange rate adjustment, with the result that the economy would be faced with longer periods of below trend output and employment.

**Sectoral implications 3.36** Other EMU studies by HM Treasury, in particular *Modelling shocks and adjustment mechanisms in EMU* and *The exchange rate and macroeconomic adjustment*, address these important issues. Some aspects of the adjustment process that are especially important for business sectors are as follows:

- one cost of adjustment relating to openness to trade is the loss of a flexible nominal exchange rate. In EMU, movements in the exchange rate would no longer be able to compensate for strong wage growth or weak productivity to the same degree. This issue is discussed further in the contribution by Professor Wendy Carlin and Dr Andrew Glyn to the EMU study *Submissions on EMU from leading academics*. Their main conclusion is that, within EMU, the traded sector would have to rely on keeping wage or productivity growth close to that of other EU countries. In the absence of an independent nominal exchange rate, and if UK wage growth exceeded that in other EU countries without an offsetting productivity gain, UK export levels could fall and firms would have to reduce output and employment;
- another cost concerns the need for sectors to change their behaviour in the face of potentially increased cyclical demand. This could be more costly to sectors which face highly cyclical demand or find cyclical demand to be particularly damaging; and
- the market structure of a sector would also influence firms' adaptability and exposure to adjustment costs. Sectors that enjoyed a high degree of protection would be less exposed to EMU-related adjustment costs. Sectors in which products are highly differentiated would derive some protection against adjustment costs from their brands. Sectors which produce homogeneous products and compete primarily on price are likely to be more exposed.

## LONGER-TERM IMPACT OF EMU

**3.37** By their nature, the longer-term dynamic consequences of these short to medium-term effects are harder to discern and more gradual. However, these potential effects are significant, including:

- an increase in competitive pressures in product and capital markets, which in a UK context would run alongside trends already shaping the supply side of the economy;
- greater specialisation, as increased trade, investment and competition allowed and encouraged firms to exploit comparative advantage and economies of scale across larger markets. Theory suggests this will benefit the economy overall, though with adjustment costs for some sectors; and
- further concentration in some sectors and dispersion in others. One important question is whether increased agglomeration would benefit regions which are already relatively well off, to the detriment of the poorer periphery.

## Competition

**3.38** Alongside euro area capital market integration, the main long-run lever for change on the supply side stemming from EMU is integration of product markets and greater competitive intensity. This occurs through four channels:

- larger product markets, meaning that firms face a larger number of competitors in their home market;
- greater integration in product markets, i.e. a reduced cost of trading or investing in other EMU countries, which reduces barriers to entry for new firms, whether by trade, FDI or merger and acquisition (M&A) activity;
- increased price transparency in the euro area, which increases consumer power and boosts price competition between firms; and
- greater capital market competition due to larger and more integrated capital markets.

**3.39** The single currency enhances existing tendencies towards greater competition in the EU. The Single Market Programme and a succession of domestic reforms on the part of Member States have done much to enhance competition and brought significant benefits to both EU firms and consumers.

### Competition and price convergence

**3.40** The EMU study by HM Treasury *Prices and EMU* considers in depth one potential indicator of competition – the extent of price convergence. If EMU were to lead to the increased integration of product, labour and capital markets, economic theory predicts that prices across euro area countries should converge – the ‘law of one price’. This ‘law’ rests on the assumption that, if prices for a given good differed between locations, arbitrageurs could profitably buy the good at the cheaper location and sell it at the more expensive location, bringing about price convergence by balancing demand and supply in both locations.

**3.41** In practice, from the buyer's perspective, arbitrage may result in a lower purchase price but itself incurs costs:

- search costs, including the cost in terms of both time and money of collecting and evaluating information about the options available;
- shipping and delivery costs, again in terms of both time and money; and
- uncertainty costs, for example the enforcement of contracts, the quality of a product bought unseen and the standard and availability of after-sales service.

**3.42** The elimination of currency exchange costs and increased price transparency should reduce search costs. The willingness of consumers to take advantage of lower search costs will depend on the costs of arbitrage, both in absolute terms and relative to the product price. Consumers may be willing to spend several hours researching the possibility of saving 5 per cent on the purchase price of, for example, a computer, but are unlikely to consider the same time well spent to purchase a cheaper box of breakfast cereal.

**Capital market competition** **3.43** Competition may be increased not only in product markets but also in capital markets. The increase in the size and the further integration of capital markets in the euro area countries may lead to an increase in capital market competition and an expansion in the number of potential borrowers and lenders. This may facilitate further merger and acquisition activity, increase competitive pressure and reduce search and transaction costs of raising capital across markets.

**The importance of competition** **3.44** Capturing the effects of greater competition is important for overall economic performance. Competition drives growth, both at the level of the overall economy and the individual firm.<sup>2</sup> It ensures that the benefits of cost reduction and innovation are passed on to consumers in the form of lower prices, increased quality and/or greater choice.

**3.45** In a competitive environment, firms have a continuous incentive to innovate. Competition quickly erodes both market share and higher (super-normal) profits derived from existing product lines and production methods. Only by innovating can firms temporarily earn excess profits.

**3.46** Product market integration due to the larger potential customer base itself increases the potential return to innovation and thereby reduces the marginal cost of R&D, further encouraging innovation. Product market integration and increased competition can thus be supportive of a higher rate of technological progress and faster adoption of new technologies and best practice. It may therefore lead to increased long-run economic growth; a result that has been confirmed in numerous firm-level studies.<sup>3</sup>

**Reallocating resources** **3.47** A more competitive environment is also conducive to a more efficient allocation of resources, both within and between firms. Academic literature suggests that this latter effect – the shift of resources away from inefficient firms to more productive and innovative competitors, and especially to new entrants<sup>4</sup> – is particularly important. While new entrants are generally less productive at the outset than most incumbents, those which survive quickly improve their performance and raise the overall level of productivity.<sup>5</sup>

<sup>2</sup>See, for example, Nickell (1996) and Blundell *et al.* (1995).

<sup>3</sup>Nickell (1996), Nickell, *et al.* (1997), Blundell *et al.* (1995), Bottasso and Sembenelli (2001), Januszewski *et al.* (1999) and Griffith (2001). See Aghion and Howitt (1998) for an overview of the underlying theory.

<sup>4</sup>Baumol *et al.* (1982) and Porter (1985) for example, argue that entry, and the threat of entry, are important determinants of overall competitive pressure in a market.

<sup>5</sup>Evidence for the US comes from Foster *et al.* (1998) and for the UK from Disney *et al.* (1999) and Barnes and Haskel (2000).

**3.48** There is a possibility that EMU might pose anti-trust risks by, for example, creating large firms through acquisitions and mergers, which might then be tempted to engage in oligopolistic practices such as collusion or cartels. The preponderance of cartel cases involving fairly homogeneous services or products<sup>6</sup> suggests that it is primarily in these types of industry that cartels pose possible anti-competitive threats. At the same time, however, the increased price transparency and potentially stronger competition fostered by EMU could help make collusive behaviour more difficult.

**3.49** Increased competition is, as has been noted, a key driver of UK economic performance. The literature finds strong evidence that increased competition improves firms' operating efficiency by reducing slack, putting downward pressure on costs, promoting more effective oversight and management and providing incentives for the efficient organisation of production. Any increase in competition in UK markets, irrespective of its source, should increase UK firm efficiency and hence UK consumer welfare.

## Specialisation

**3.50** Specialisation describes the extent to which the activity of a given region occurs in a small number of industries and is conventionally defined relative to other countries or regions. A country is relatively specialised in a specific sector if that sector accounts for a relatively large proportion of its activity: for example, the UK is specialised in an EU context in refined petroleum products.

### Drivers of specialisation

**3.51** The argument that a single currency promotes specialisation rests on two elements of the economic literature:

- **comparative advantage:** resources should be employed in activities in which their relative efficiency is superior to that of others; and
- **economies of scale:** the average cost of producing something falls as the volume produced rises. If the euro helps reduce trade and transaction costs, it would enable companies to reap economies of scale and encourage national specialisation in industries where comparative advantage is greatest.

**3.52** The argument that increased trade, facilitated by a single currency but also by more general developments related to the development of the Single Market and trends in globalisation, might lead to greater specialisation is an important one. The EMU study by HM Treasury *EMU and trade* assumes that trade encourages countries to specialise in activities where they have a comparative advantage. Greater levels of cross-border investment may also augment specialisation as investment is a crucial conduit for the reallocation of productive resources. Competition is a key driver of greater allocative efficiency and could reinforce specialisation where there is comparative advantage or economies of scale.

### Macroeconomic impacts of specialisation

**3.53** The microeconomic benefits of specialisation are accompanied by concerns about whether greater specialisation might, in a monetary union, increase vulnerability to macroeconomic asymmetric shocks (Krugman, 1993). Traditional trade models imply that trade and the gains from trade will be greatest between countries which are the least alike in their economic structure. These countries have the most to gain from specialising according to their comparative advantage and reallocating resources to where they earn the highest

<sup>6</sup> In 2001 the Commission imposed fines on 10 cartels: two service industries – airlines services and banking, suppliers to two national EU beer markets and suppliers of six intermediate industrial products (graphite electrodes, sodium glutamate, vitamins, citric acid, zinc phosphate and carbonless paper).

returns. At the aggregate level, such models predict that the removal of currency volatility would encourage further specialisation in national economies, exposing particular countries to sector-specific shocks (see the EMU study *Analysis of European and UK business cycles and shocks* by Professor Michael Artis for a fuller discussion).

**3.54** Contrary to the predictions of traditional trade models, however, new trade theory observes that most trade occurs between countries with similar factor endowments and that this trade is predominantly intra-industry rather than inter-industry. Growing intra-industry trade could (though does not necessarily) imply that trade could rise without a comparable increase in sector specialisation; an argument highlighted by Barry Eichengreen in the EMU study *Submissions on EMU from leading academics*. This would suggest that the removal of the currency barrier might have only limited implications for vulnerability to asymmetric shocks stemming from the industrial structure. Section 5 looks at this in practice, using both the experience of the SMP and evidence from the US.

## Concentration

**3.55** Industry concentration describes the extent to which activity in a given industry or sector takes place in a small number of firms, while geographical concentration describes the extent to which activity in a given industry or sector takes place in a small number of countries or regions. Industry concentration tends to decline as markets expand because the minimum efficient plant size falls in relation to the market. In R&D-intensive or advertising-intensive sectors, however, there may be a lower limit to concentration (as discussed further in Section 6), while the possibility that EMU might encourage mergers and acquisitions has already been noted.

### Drivers of geographical concentration

**3.56** This study focuses mainly on geographical concentration. Firms concentrate their activities in specific locations to take advantage of external scale economies or other advantages such as those of reputation. Examples of spatially concentrated clusters of activity are found in sectors such as financial services (the City of London) and films (Hollywood). Positive externalities or centripetal forces can attract activity to a cluster. These include greater business opportunities for firms compared to other locations and the availability of skilled labour. According to theories of new economic geography, covered in more detail in the EMU study by HM Treasury *The location of financial activity and the euro*, these factors offer competitive advantages for firms compared to other locations that attract them to the cluster. For a cluster to grow, these centripetal forces need to outweigh negative externalities or centrifugal forces, such as the costs of congestion and high commercial rents.

**3.57** Krugman and Venables (1990, 1995a,b) show that lower transport costs (or, in the context of EMU, lower conversion costs and reduced exchange rate volatility) can influence the location of firms. They demonstrate that firms tend to locate in larger markets when trade costs, such as transport costs, are neither too high nor too low. If transport costs are high, then firms will disperse to avoid product market competition. If transport costs are low, then the choice of location is determined by the cost of factor inputs and the ability to exploit internal scale economies. With low trade costs, markets can be served easily from any location, meaning firms have the opportunity to exploit scale economies. Proximity to markets is less important as a determinant of location than, for example, the cost of production and the positive externalities offered by locating in a cluster.

### Impacts of concentration

**3.58** The Krugman and Venables model raises the question of whether EMU would drive firms to locate in successful 'core' regions in order to exploit, for example, the external economies of scale offered by clusters, or whether they would move to 'periphery' regions where lower costs of production offset increased transport costs. In a UK context, this invites the question as to whether UK regions are 'core' or 'periphery' and how EMU might affect

their attractions as business locations. If joining EMU were to lead to a reduction in transport costs, it might hasten the decline of poorly performing regions as firms relocated. Set against this, however, might be better financing opportunities and improved information flows (though these might also provide new growth opportunities for successful regions).

## CONCLUSIONS: KEY SECTORAL CHARACTERISTICS

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**3.59** Building on this theoretical discussion, Section 4 reviews the evidence to date on the short to medium-term effects of EMU, while Section 5 considers evidence on the potential longer-term effects. Section 6 draws the theory and evidence together in a dynamic and forward-looking context, considering the ways in which EMU may affect a sector depending on its specific sectoral characteristics. The theoretical discussion in the present section has highlighted six key characteristics which will be important determinants of the impact of EMU. These six characteristics are used as a tool for judging the evidence in Sections 4 and 5 against the expectations of economic theory, and are also the focus of the forward-looking analysis in Section 6:

- **openness and exchange rate sensitivity.** The discussion of the potential impact on cross-border trade and investment in this section suggests that sectors which are open to trade may be affected more strongly than non-traded sectors. An important issue is whether exposure is primarily to euro area or non-euro area currencies;
- **pricing behaviour.** The discussion of the potential impact of EMU on competition underlines the importance of pricing behaviour. The impact of EMU on sectors will depend on the primary pricing currency in a sector, the degree to which firms set prices and the degree of price convergence;
- **market structures.** The degree of product differentiation is an important factor affecting the potential impact of EMU on trade. If products are highly differentiated and firms have market power, then trade may be less sensitive to prices than in sectors which produce homogeneous goods;
- **firm size.** The removal of exchange rate transaction costs and exchange rate volatility may represent a greater relative saving for small firms. The discussion on the potential impact on investment in this section suggests that the benefits of more integrated wholesale capital markets may be greater for larger firms, while small firms may benefit to a greater extent from developments in retail financial markets;
- **finance and ownership.** The potential impact of EMU on cross-border investment and on capital market integration may vary depending on the degree to which firms use external finance and on the form of managerial control and ownership; and
- **cyclical exposure.** The discussion of the impact of EMU on the mechanisms by which economies adjust to shocks and change illustrates the importance of the degree of cyclical sensitivity of a sector's output or the extent to which a sector finds cyclical damage.

Given the many other factors shaping the business landscape, and after only four years of EMU, it is difficult to discern with certainty an EMU effect on cross-border trade and investment. However, the analysis here suggests that:

- intra-euro area trade has outpaced that of the non-euro area countries of Europe in a number of those sectors which economic theory and the analysis in this study would suggest as the most likely to be affected by EMU;
- service sector trade exhibits no clear pattern, although EMU would not be expected to have as great an effect on services trade as on goods trade;
- domestic investment spending in euro area countries has outpaced that of the EU15 as a whole, although by sector there is no discernable pattern, and there is little evidence that this is as a result of EMU;
- there is evidence that the UK's share of inward foreign direct investment (FDI) from outside the EU has fallen relative to other EU members since the introduction of EMU. This must, however, be considered against a backdrop of factors such as the rapid global increase in FDI over the late 1990s, largely driven by M&A, and the sharp fall since 2000, as well as the UK's leading position within Europe in terms of inward investment. It is difficult to detect with any confidence a specific EMU effect; and
- changes in FDI stocks at a sectoral level before and after the start of EMU show no clear pattern, this analysis being particularly complicated by the multiplicity of factors influencing FDI.

## Evidence from introduction of the euro

**4.1** This section focuses on the evidence on the potential short to medium-term effects of EMU. It considers the extent to which there has been any indication in the euro area, since the start of EMU, of:

- increased cross-border **trade**; and
- increased **investment** and **foreign direct investment** (FDI).

**4.2** This section does not consider evidence on changes to economic adjustment mechanisms, the third of the short to medium-term effects identified in Section 3. This issue is covered at the macroeconomic level in the EMU study by HM Treasury *Modelling shocks and adjustment mechanisms in EMU*.

**4.3** This is essentially a static analysis, based on the evidence and circumstances to date. The analysis in Section 6, which focuses on industry characteristics and how these might be affected by a decision to join the EMU, is more forward looking. The assessment of the five tests is also explicitly forward looking.

## Evidence from the SMP

**4.4** There are inherent difficulties in attributing shifts in sector behaviour specifically to the euro; not least, the variety of other factors shaping the European industrial landscape, and the limited time period from which evidence can be drawn. To address this latter difficulty in particular, this section supplements analysis of the current period with references to an ongoing episode of European integration – that following the implementation of the Single Market Programme (SMP) in 1992. The aim of the SMP was to achieve the free movement of goods, services, labour and capital across the EU, and it introduced sweeping changes to the European business environment intended to boost openness and competition. This section draws on the latest internal market scoreboard from the European Commission, which surveys EU companies' perceptions of the business environment and aims to identify the impact of the SMP on business.

## Trends in trade

**4.5** The EMU study by HM Treasury *EMU and trade* concludes that there are sound theoretical reasons why EMU should enhance trade. These stem, as was noted in Section 3, from reduced exchange rate uncertainty, lower currency transaction costs and greater price transparency.

**4.6** The EMU study *EMU and trade* also undertakes a rigorous review of empirical research on trade and currency unions. It finds that there is evidence in favour of a potentially significant euro effect on trade in goods. It also concludes that the scale of these benefits is likely to increase with the degree of trade integration between the UK and the euro area. It finds that trade intensity within the euro area has increased since the euro's launch. Extra-euro area trade, however, appears to have risen faster than trade within the euro area since the start of EMU. The study suggests four possible explanations:

- buoyant growth in the US in the late 1990s;
- oil price rises;
- ongoing integration and economic cooperation between the EU and the Central and Eastern European (CEE) economies; and
- possibly, the depreciation of the euro against the US dollar since 1999.

**4.7** The EMU study *EMU and trade* also examines post-EMU developments in trade in services. It finds that there was a sharp upward trend in intra-EU services trade throughout the 1990s, except in France and Italy; this was mirrored in extra-EU trade only among smaller EU countries. This secular trend may be a reflection of the progressive implementation of the SMP. There is no evidence of enhanced integration since 1999.

**4.8** Overall, the EMU study *EMU and trade* concludes that a reasonable range for the potential increase in UK trade with the euro area resulting from UK membership of EMU would be between 5 and 50 per cent, without any trade diversion from the non-euro area. Complementing the macroeconomic level analysis of that study, this section takes a more in-depth look at sectoral trade in the EU. It examines sector-level trade patterns within the euro area and the wider EU since 1999, and compares these with the pre-EMU period and with both the predictions of economic theory (outlined in Section 3).

### EMU's impact on trade in goods by sector

**4.9** It is difficult in the relatively short period since 1999 to identify clear sectoral trade impacts from the introduction of the single currency. This section examines how import growth from within the euro area has, in each sector, performed relative to import growth from outside the euro area since the advent of EMU.

**4.10** Table 4.1 lists the 30 euro area manufacturing sectors which have a trade share of at least 1 per cent of total euro area imports. (Table C5 in Annex C includes a longer list of sectors for which trade shares exceed 0.5 per cent). It ranks these sectors by the difference between the change in intra-euro area import growth and the change in extra-euro area import growth. In each case, the change in import growth is measured between the periods 1996 - 1998 (the three years before the euro came into existence) and 1999 - 2001 (the period since the single currency has been in operation, and for which data are available). If the single currency were having an effect, the change in intra-euro area import growth might be expected to exceed the change in extra-euro area import growth. More detail of this methodology (variations of which are used in Tables 4.4, 4.5, 4.7 and 4.8) is provided in Box 4.1.

**Box 4.1: The ‘difference in differences’ method of analysis**

This section uses a ‘difference in differences’ method of analysis to compare the performance of the euro area economies with that of the UK or other non-euro area economies since the introduction of EMU.

The analysis begins by looking at growth of a particular variable in a euro area country and observing how the rate of growth has changed since EMU began. It then looks at a comparator country – in this case a non-euro area country – and observes whether the rate of growth of the variable in question has changed since the beginning of EMU. The two changes in rates of growth are then compared, with the aim of observing whether any change in the euro area has been greater than that in the non-euro area.

The table below sets out a hypothetical example to aid interpretation of this methodology. It considers two countries, one euro area (A) and one non-euro area (B), and one variable, import growth. Country A’s import growth in the years before EMU was 10 per cent and increased to 15 per cent in the years after the start of EMU, representing an increase in the growth rate of 5 percentage points. In country B, import growth was also 10 per cent in the years before EMU, and increased to 12 per cent in the years after. Hence the increase in import growth between the two periods was 2 percentage points. Finally, to assess whether country A’s rate of growth has increased more or less than country B’s since the start of EMU, the change in import growth of country B is subtracted from the change in import growth of country A, giving in this case a figure of 3 percentage points. Since the beginning of EMU, the rate of import growth in country A has increased by more than that in country B.

	Euro area country A			Non-euro area country B			Change in A’s import growth relative to B’s (percentage points)
	1996-1998 (per cent)	1999-2001 (per cent)	Difference in growth between two periods (percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Difference in growth between two periods (percentage points)	
Import growth	10	15	5	10	12	2	3

**4.11** Column 2 of Table 4.1 does not, however, suggest such an effect. The difference in intra-euro area import growth before and after EMU exceeds the difference in extra-euro area import growth before and after EMU in only a third of the sectors (those with a positive differential and highlighted in bold), and match it in just two. In the remaining 18 sectors, the difference in intra-euro area import growth between the two periods is less than the difference in extra-euro area import growth.

**Table 4.1: Difference between change in intra-euro area and change in extra-euro area import growth rates between 1996-1998 and 1999-2001**

1 Manufacturing sector	2 Difference between:		3
	Intra-euro area and extra-euro area import growth (percentage points)	Intra-euro area and extra-euro area Western Europe import growth (percentage points)	
Motor vehicles	<b>11</b>	<b>8</b>	
Motor vehicle parts and accessories	<b>6</b>	<b>22</b>	
TV, radio, sound, video recording apparatus	<b>5</b>	<b>22</b>	
Basic iron and steel and ferro-alloys	<b>5</b>	<b>3</b>	
Aircraft and spacecraft	<b>4</b>	<b>-5</b>	
Basic chemicals	<b>4</b>	<b>5</b>	
Office machinery and computers	<b>1</b>	<b>5</b>	
Electricity distribution and control apparatus	<b>1</b>	<b>4</b>	
Rubber products	<b>1</b>	<b>8</b>	
Plastic products	<b>1</b>	<b>4</b>	
Other fabricated metal products	<b>0</b>	<b>3</b>	
Furniture	<b>0</b>	<b>3</b>	
Measuring, checking etc instruments	<b>-1</b>	<b>1</b>	
Other chemical products	<b>-1</b>	<b>-5</b>	
Basic precious, non-ferrous metals	<b>-2</b>	<b>2</b>	
Non-vehicle mechanical machinery	<b>-2</b>	<b>1</b>	
Other wearing apparel, accessories	<b>-2</b>	<b>5</b>	
Machine tools	<b>-2</b>	<b>-1</b>	
Other special purpose machinery	<b>-2</b>	<b>0</b>	
Other food products	<b>-3</b>	<b>0</b>	
Pulp, paper, paperboard	<b>-3</b>	<b>0</b>	
Pharmaceuticals, medicinal, botanical prods.	<b>-3</b>	<b>-5</b>	
General purpose machinery	<b>-4</b>	<b>2</b>	
Footwear	<b>-5</b>	<b>-5</b>	
Electronic valves, tubes, other components	<b>-7</b>	<b>-23</b>	
Medical, surgical, orthopaedic equipment	<b>-8</b>	<b>-5</b>	
Meat processing, preserving, products	<b>-8</b>	<b>-2</b>	
Electrical equipment not elsewhere classified	<b>-11</b>	<b>9</b>	
Refined petroleum products	<b>-14</b>	<b>-5</b>	
TV, radio transmitters and apparatus	<b>-17</b>	<b>9</b>	

Note: The table shows the difference between the change in growth of intra-euro area imports before and during EMU (1996-1998 and 1999-2001) and the change in growth of extra-euro area imports over the same period. A positive number, highlighted in bold, indicates that the change in intra-euro area import growth over this period exceeded the change in extra-euro area import growth. See Box 4.1 for details of the methodology.

Source: Eurostat; HM Treasury and DTI calculations.

**4.12** Rather than comparing intra-euro area trade with all extra-euro trade, a better control group may be the non-euro countries of the EU and Western Europe.<sup>1</sup> These countries are similar to the euro area in terms of trading patterns, incomes and economic conditions. This means that trading data are less likely to be distorted by, for example, a secular shift of low value-added manufacturing towards locations other than the EU or Western Europe in general, such as the Central and Eastern European economies or elsewhere in the world.

**4.13** Using these countries as a baseline, a different picture emerges. As Column 3 of Table 4.1 illustrates, the change in intra-euro area import growth exceeds the change in trade with the rest of Europe in 18 of the 30 sectors (and matches trade performance in three sectors).<sup>2</sup> This provides some tentative evidence that an EMU effect may be taking place, at least in

<sup>1</sup> Denmark, Norway, Switzerland, Sweden and the UK.

<sup>2</sup> A more detailed table is provided in Annex C, covering industries accounting for at least 0.5 per cent of total euro area imports. The results of the extended table are broadly similar to those discussed here, with positive figures for 27 sectors out of 48 and an equal performance in five (see Table C5).

some sectors. It does not, however, show whether the overall effect is trade creating (overall trade increases) or trade diverting (euro area trade benefits at the expense of non-euro area EU markets). The macro-level evidence reviewed in the EMU study *EMU and trade* posits, however, that EMU is trade creating.

**4.14** A second question is whether there is any pattern to the manufacturing industries that have outperformed (or underperformed) in terms of import growth. A range of characteristics that might render sectors more exposed to EMU's impact on trade were introduced in Section 3 and are the focus of Section 6. Three of those characteristics are analysed here:

- exchange rate sensitivity: proxies include sectors with high inventory ratios or which generally have long lags between production and payment, which will be relatively exposed to exchange rate fluctuations;
- market structure: in particular, product differentiation. Relatively undifferentiated products (proxied by low advertising expenditure) are more price and hence exchange rate sensitive, and would be expected to experience a greater trade effect from EMU; and
- firm size: the removal of transaction and hedging costs is likely to be of greater benefit to small firms than to large.

**4.15** Table 4.2 lists manufacturing sectors characterised by low levels of advertising or high levels of inventory or work in progress, or in which small firms account for a large share of output. Such sectors<sup>3</sup> might be expected to benefit most from any boost to trade delivered by EMU. As is suggested by the sectors highlighted in bold (which represent those, drawing on Table 4.1, where the intra-euro area trade performance has outpaced trade performance with non-euro area Western Europe) this does indeed appear to have been the case.<sup>4</sup>

**Table 4.2: Sectors where trade might be particularly affected by EMU**

High stocks and work in progress as a proportion of turnover, low advertising expenditure as a per cent of turnover; and/or a high share of small firms <sup>1</sup> in turnover	
<b>Basic iron, steel, ferro-alloys</b>	Footwear
<b>Basic precious, non-ferrous metal</b>	Pharmaceuticals
Aircraft, spacecraft	<b>Non-vehicle machinery</b>
<b>Motor vehicle parts</b>	<b>Measuring instruments</b>
<b>Basic chemicals</b>	<b>Other fabricated metal prods.</b>
<b>Other wearing apparel</b>	<b>Furniture</b>
<b>General purpose machinery</b>	
<b>Plastic products</b>	

<sup>1</sup> Annual turnover of less than £10 million.

Note: Figures in bold indicate that intra-euro area trade outperformed trade with non-euro area Western Europe, post-EMU relative to pre-EMU, based on column 3 of Table 4.1.

Source: HM Treasury and DTI.

<sup>3</sup> Based on UK data. Sector characteristics in terms of advertising expenditure (proxy for market structure), small firms (proxy for firm size) and high stocks/work in progress (proxy for exchange rate sensitivity) are detailed in Table C6 in Annex C. Table 4.2 uses the top five firms accounting for more than 1 per cent of imports from each category.

<sup>4</sup> Clearly the application of these proxies for the theoretical characteristics cannot be used in a blanket way. There are some obvious exceptions which do not fit the pattern, aircraft and spacecraft, for example, are classified as having low advertising expenditure, hence implying a relatively undifferentiated product. But this is clearly not the case.

**4.16** If a majority of the sectors that might be expected to be sensitive to EMU's trade effects have indeed experienced faster intra-euro area trade growth post-EMU than pre-EMU compared with the change in extra-euro area trade growth, this does not necessarily imply that the relationship works in both directions. Of the 18 sectors in which intra-euro area trade outperformed trade with the rest of Europe, just over half would have been predicted to do so on the basis of their low advertising expenditure, high share of small companies or high stocks/work in progress relative to turnover. Overall, therefore, there is tentative evidence of a trade effect of EMU at a sectoral level.

**Trade in services 4.17** Services are a key component of overall international trade. As was shown in Section 2, this is particularly true for the UK. Assessing the impact of EMU on sectoral service trade is much more complicated than for goods. Services data are not available at a detailed level across the EU and disaggregated data are only available at current, not constant, prices. Analysis of services trade over time, unlike that of goods, is thus distorted by price as well as volume changes.

**4.18** It is, nevertheless, useful to consider differences in the composition of UK and EU trade in services. Table 4.3 shows the destination of UK and EU service exports as a percentage of total service exports in both 1998 and 2001. UK service exports are more concentrated on the US market than are EU exports. The difference has, however, narrowed since 1998, with a rising share of UK service exports going to the EU and a rising share of EU service exports to the US.

**Table 4.3: Destination of UK and EU service exports**

Per cent of total	UK			EU		
	Intra EU	Extra EU	US	Intra EU	Extra EU	US
1998	38	62	23	54	46	15
2001	41	59	22	55	45	17
Change 1998-2001 (percentage points)	3	-3	-1	1	-1	2

Source: Eurostat and HM Treasury calculations.

**4.19** The composition of service exports is broadly similar across the EU; transport, travel and other business services typically make up around three quarters of total service exports. The UK is, however, also characterised by sizeable financial service exports, as highlighted in the EMU study by HM Treasury *The location of financial activity and the euro*.

**4.20** Because of data shortcomings, only a basic analysis of the change in service sector exports since EMU is possible. Table 4.4 describes the change in the UK share of intra-EU service sector exports between 1998 and 2001 compared with the changes in the French and German shares. Where the growth in the UK service trade share outpaced that of the French or German share over the three-year period, the figure shows a positive differential and is highlighted in bold; where it lagged, a negative differential is showing. With respect to total services trade, for example, a stable UK share compared with a decline in the German share of 1 per cent is presented as 1 in the table.

**Table 4.4: Differences in share of intra-EU service sector export growth for UK, France and Germany, 1998-2001**

	Percentage point difference between growth of UK share of intra-EU service sector exports and share of:	
	Germany	France
Total services	<b>1</b>	<b>3</b>
Transport	0	<b>3</b>
Travel	-2	-4
Communications	<b>4</b>	-3
Construction	-1	-2
Insurance	-2	<b>9</b>
Financial	0	<b>2</b>
Computer and information services	-1	-5
Royalties/licence fees	<b>8</b>	<b>8</b>
Other business services	<b>3</b>	<b>8</b>
Personal, cultural and recreational	0	<b>1</b>

Note: indicates difference between the growth of UK share of intra-EU service sector exports over 1998-2001 and the growth of the share of France and Germany. Positive numbers, highlighted in bold, indicate that the growth of the UK share exceeded that of France or Germany.

Source: Eurostat and HM Treasury calculations.

**4.21** Growth in the UK share of intra-EU service sector exports outpaced that of both France and Germany in two sectors: ‘royalties/licence fees’, and ‘other business services’. UK growth in ‘financial services’ exports was faster than in France and equal to Germany, but growth was slower than in both countries in ‘travel’, ‘construction’ and ‘computer and information services.’

#### Empirical analysis of sectoral trade patterns

**4.22** Two empirical studies have considered the impact of exchange rate volatility on sectoral trade. Maskus (1986) focuses on US trade with the UK, Germany, Canada and Japan over the period 1974-1984. The analysis looks at overall trade and trade in seven sectors in each of the four countries.<sup>5</sup> Exchange rate uncertainty was measured as that part of the percentage change in the real spot rate that was unexpected at the beginning of each quarter. For 26 country sectors out of the 64 which were examined, exchange rate volatility was shown to have a negative and statistically significant impact on US trade, and such impacts were generally greater for the non-manufacturing sectors. However, in only one case did the presence of exchange rate volatility reduce trade by more than 7 per cent.

**4.23** Stokman (1995) applies a sectoral approach to trade among five EU members, namely Germany, France, Italy, Belgium and the Netherlands, using five sectors.<sup>6</sup> Trade is measured as the volume of exports of a commodity from a particular country to the then European Community. Based on quarterly data over the period 1979 to 1990, the study concludes that exchange rate volatility has a negative and statistically significant impact on trade for most countries and in most sectors. However, after averaging the results across the various equations, elimination of exchange rate risk was estimated to increase aggregate trade by less than 3 per cent overall.

#### The impact of the SMP on trade

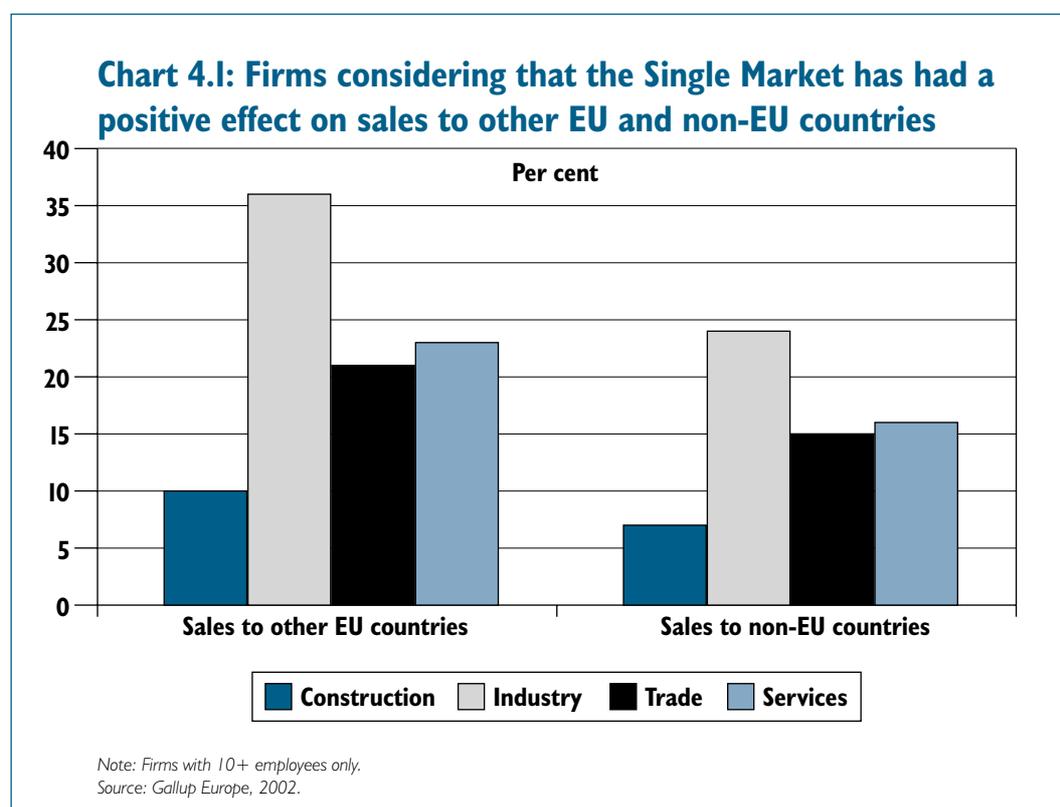
**4.24** The SMP is a useful cross-reference for the impact of EMU as it also focused on the reduction of transaction costs and removing barriers to trade in the EU. The European Commission DG Internal Market (2002) estimates that the SMP has added just under 0.2 percentage points a year to GDP growth since its completion in 1992, leaving EU GDP 1.8 per cent higher than it would have been without the SMP.

<sup>5</sup> Agriculture, crude materials, chemicals, transport equipment, machinery, manufactured goods classified chiefly by material and miscellaneous manufactures.

<sup>6</sup> Food (SITC 0 and 1), raw materials (SITC 2 and 4), chemicals (SITC 5), manufactures (SITC 6) and machinery (SITC 7).

**4.25** At an aggregate level, the SMP appears to have contributed to a significant increase in intra-EU trade<sup>7</sup> (European Commission, DG Internal Market, 1996a). Between 1985 (when the SMP was agreed in principle) and 1995, the market share of intra-EU imports increased by 7.9 per cent in those sectors which had previously been characterised by high non-tariff barriers and could therefore be regarded as potentially ‘SMP sensitive’. This compared with a 3.1 per cent rise in other manufacturing sectors<sup>8</sup> (see Section 5 for further detail). Furthermore, the composition of trade flows shifted from inter-industry to intra-industry trade, and towards goods differentiated by quality rather than price.

**4.26** The impact of the euro might be concentrated on those sectors ‘missed’ by the SMP. The latest *Internal Market Scoreboard* from the European Commission (Gallup Europe, 2002) asked companies in four broad sectors – construction, industry, trade and services – whether they thought the Single Market had led to increased or decreased overseas sales inside and outside the EU, or had been of negligible importance. Chart 4.1 suggests that in all sectors, and especially services, trade and construction, most companies did not consider that the SMP had had a positive effect on sales. In general there is some tentative backing for the proposition that there are still potential gains to be realised, particularly in broad sectors such as services.



#### Conclusion on sectoral impacts of trade

**4.27** It is difficult to judge EMU’s effect on sectoral trading patterns on the basis of data covering, for the most part, only the euro’s first three years (and these data do not incorporate any impact from the introduction of euro notes and coins). It is, however, possible to draw some tentative conclusions:

<sup>7</sup> In 1996 there was a large-scale evaluation of the Single Market Programme. A good summary of the various studies’ findings can be found in European Commission, DG Internal Market (1996a). See also individual studies, such as European Commission, DG Internal Market (1996b,c).

<sup>8</sup> The SMP also had a positive impact on trade from outside the EU. Its overall effect seems to have been trade creating rather than diverting.

- intra-euro area import growth appears to have out performed non-euro Western European import growth in a number of sectors. Most of these sectors are those which economic theory and the analysis in this study would suggest are the most likely to be affected by EMU. There are, however, a significant number of exceptions; and
- EMU would not be expected to have as great an effect on service sector trade as on goods trade. Were EMU the only new development, the stronger growth of UK service exports compared to France and Germany in a number of sectors since the start of EMU would be somewhat surprising. There is, however, no clear pattern to services sector data and relative performance is likely to reflect a variety of non-EMU related factors.

**4.28** Overall, the sectoral evidence does not contradict the economy wide finding of evidence of a positive effect of EMU on trade between euro area members in the EMU study by HM Treasury *EMU and trade*.

## Trends in investment

**4.29** The second of the potential short to medium-term effects of EMU identified in Section 3 is the impact on cross-border investment and total business investment.

**4.30** The theory discussed in Section 3 and Annex A identifies the following main channels through which EMU might lead to increased domestic investment:

- reduced exchange rate volatility, leading to reduced risk and lower uncertainty, especially for those firms which trade with the euro area; and
- reduced transaction costs and increased price transparency leading to enhanced integration of capital markets, and a reduced cost of capital.

**4.31** The EMU study by HM Treasury *EMU and the cost of capital* divides the cost of capital to firms into two components: the credit risk free rate (generally proxied by the interest rate paid by government bonds) and the market risk rate (reflecting firm-specific credit risk and liquidity risk). It finds evidence that the prospect of EMU membership has contributed to a fall in the credit risk free rate in euro area countries previously characterised by high and volatile inflation (e.g. Spain and Italy), but finds no evidence of a similar EMU related fall in larger, low inflation countries (e.g. Germany and France). While there is evidence of growing integration in euro area and EU financial markets, there is not yet conclusive evidence that this has fed through to a lower market risk premium.

### Gross fixed capital formation

**4.32** Section 2 described the broadly similar composition of gross fixed capital formation (GFCF) in 2001 in the EU, UK, France and Germany. This section examines changes in GFCF by sector before and after the introduction of the euro. As the data are very limited and not available across the EU in detail, drawing conclusions is inevitably difficult.

**4.33** Table 4.5 shows growth in GFCF expenditure in the euro area and the EU in two three-year periods – 1995 to 1998 and 1998 to 2001. The final two columns indicate the difference between the growth rates in each period. In each sector (except ‘other investment products’), this difference is greater in the euro area than in the EU as a whole, indicating that investment growth between 1996-1998 and 1999-2001 has been stronger in the euro area than in the EU as a whole.

**Table 4.5: Euro area and EU growth of GFCF by sector, 1996-1998 and 1999-2001, 1995 prices**

Per cent	Growth, 1996-1998		Growth, 1999-2001		Percentage point change in growth between 96-98 and 99-01	
	Euro area	EU	Euro area	EU	Euro area	EU
<b>Total</b>	<b>9</b>	<b>11</b>	<b>10</b>	<b>10</b>	<b>1</b>	<b>-2</b>
Agriculture	1	5	7	0	6	-6
Metal products and machinery	19	23	15	15	-4	-8
Transport equipment	23	24	18	16	-5	-9
Construction: housing	3	3	1	0	-1	-3
Other construction	-2	-1	10	9	12	10
Other investment products	23	23	15	16	-8	-7

Note: Numbers may not sum due to rounding.

Source: Eurostat; HM Treasury calculations.

**4.34** From a sectoral perspective, it is interesting that the euro area's stronger GFCF growth is spread across all sectors (though this may be due to a number of country-specific factors). The greatest difference between euro area and EU growth are in agriculture (which accounts for only a very small proportion of total GFCF). Moreover, the overall pattern of investment growth may also be influenced by the economic cycle and its timing, since investment tends to be among the most cyclically sensitive of expenditure categories.

## Trends in foreign direct investment

**Importance of EMU for FDI** **4.35** Foreign direct investment (FDI) is an important element of total investment, Section 3 discusses the motivations behind FDI and how these might be influenced by EMU entry.

**4.36** This section focuses on the evidence on FDI inflows. Although they are not covered in detail here, FDI outflows (on which UK-owned businesses benefit in terms of earning income on capital invested abroad) are also important to the UK's economic performance and its contribution to global performance.

**4.37** This sub-section sets out the stylised facts on FDI in the UK and the euro area, and discusses the difficulties associated with interpreting FDI data. It then reviews the evidence as to whether the UK's FDI position has been affected to date from being outside the single currency and for any EMU effects within the euro area. The analysis is structured as follows:

- (i) **FDI stocks:** the most reliable FDI data refer to FDI stocks. These are calculated as the accumulation of FDI flows over time, added to the revaluation of historic stocks. While useful for observing underlying trends and sectoral positions, they are by definition backward looking and take some time to compile. Short-term trends can often be masked by sharp revaluations;
- (ii) **FDI flows:** more volatile than stocks, FDI flows capture the flow of funds into a country in any given year and are prone to sharp swings. Flow data are useful for picking up new trends and are frequently quoted in international comparisons. In this study, flow data are used to differentiate the recent boom in merger and acquisition (M&A) activity from underlying FDI statistics, analyse the change in the UK's share of EU FDI in recent years and identify the main sources of FDI into the UK and EU;

- (iii) **project numbers:** collected by Government agencies such as Invest UK for the UK, and companies such as Ernst and Young, these are useful for providing an indication of the latest views of new and potential investors. Although not as rigorous as official data, they add qualitative information; and
- (iv) **other survey evidence:** is an additional source of potentially useful information of a more forward-looking nature.

**4.38** This section also includes a discussion of the more general lessons of the SMP concerning the impact of lower investment barriers on FDI flows.

**Key caveats 4.39** There are particular difficulties in drawing conclusions from just a few years' of FDI data. Such a short time series makes it difficult to identify trends, particularly when there have been volatile contributing factors such as the peak in European M&A activity in 2000. There may also be substantial lags associated with the feed through of investment decisions into FDI statistics.

**4.40** The definition and collection of FDI data also makes its interpretation difficult. Some of the problems involved are outlined in Box 4.2.

**4.41** In addition, it is difficult to gauge the impact of the perceived likelihood or timing of UK EMU entry on FDI decisions to date. Had the UK been perceived as remaining permanently outside EMU (which is not the basis for the Government's policy), FDI flows in and out of the UK might have been very different. Alternatively, of course, they might not have been; there is no adequate counterfactual for comparison. Survey findings suggest that in autumn 2002 over two thirds of engineering firms expected the UK to have adopted the euro by 2005 (Engineering Employers Federation, 2002).

**4.42** These data difficulties, supplemented by a lack of data on bilateral FDI flows, mean that it is not possible to undertake an econometrically rigorous economy-wide analysis of the potential impact of currency unions on FDI, analogous to the body of evidence and analysis on the impact on cross-border trade discussed in the EMU study by HM Treasury *EMU and trade*. Nevertheless, comprehensive and detailed analysis of available data sources is, as noted above, an important part of this study.

**The UK: stylised facts 4.43** As a starting point, some stylised facts highlight the UK's strong position in terms of both inward and outward FDI (UNCTAD, 2002):

- the UK had the **second largest stock of inward investment in the world in 2001**. At nearly US\$500 billion, this made up almost a fifth of total EU FDI stocks and 7 per cent of world FDI stocks;
- the UK received the **second largest amount of inward investment flows in the world** in 2001.<sup>9</sup> At almost US\$54 billion, this was higher than any other European country and second only to the US;
- the **UK's stock of outward investment in 2001 was almost US\$950 billion**, around 14 per cent of the global outward investment stock and one third of the EU outward investment stock; and
- the UK is a **large outward investor**, investing US\$39 billion abroad in 2001 and US\$253 billion in 2000,<sup>10</sup> making the UK the largest outward investor in that year. UK outward investment constituted 6 per cent of total global outward investment in 2001 and 10 per cent of EU outward investment.

<sup>10</sup> The last full year of data.

<sup>11</sup> Largely reflecting the acquisition of Mannesmann by Vodafone.

**Box 4.2: FDI data – problems of interpretation****Definition of FDI data**

The International Monetary Fund defines FDI as an international investment aimed at establishing a lasting interest in an overseas enterprise. It might be thought to imply a long-term relationship and substantial investor influence on the way the enterprise is managed. Such an interest is statistically defined as owning 10 per cent or more of the (for an incorporated enterprise) or the equivalent (for an unincorporated enterprise).<sup>a</sup> Acquiring less than 10 per cent of a company is regarded as portfolio investment, although this distinction is arbitrary. An alternative and helpful distinction may be drawn with respect to whether investors themselves are financial or non-financial investors (Wójcik, 2001).

Three FDI statistical series are widely available: flows, stocks and earnings. For the purpose of this study's analysis, it is the first two which are of primary interest. Within these, FDI is split into three broad sub-categories: equity capital, reinvested earnings and other capital transactions. Equity capital consists of transactions involving shares, such as mergers, acquisitions, and other share purchases not involving a change of ownership. Reinvested earnings are simply those earnings not distributed as dividends and those earnings not remitted back to the home country. Other capital transactions consist of mainly inter-company transactions, such as the borrowing and lending between parent and subsidiary companies.

**Difficulties in interpreting FDI data**

It is a common misconception to assume that all FDI is 'greenfield', e.g. a large foreign manufacturer opening a new plant in the UK. While much of this is included in FDI flow statistics, not all of it will be. For example, investment undertaken by domestic subsidiaries of foreign-owned firms using local finance and therefore with no flow of money across borders would not appear in FDI flow statistics. Furthermore, greenfield investment is, in practice, likely to be dwarfed by the substantial flows of equity and other capital transactions for financial reasons, not to mention investment in existing physical capital.

Even if it were possible to identify greenfield FDI, the lags associated with investment decisions could complicate any conclusions about the impact of EMU.

While the data for source-country FDI can be useful in identifying where inward investment into a country comes from, it does not always indicate its ultimate origin. For instance, FDI into the UK which originates in the US, but comes via the Netherlands, is recorded as FDI from the Netherlands. One reason why foreign firms might invest in the UK via a third country is that they have their headquarters based in that country (for example, many firms have a single European headquarters), and investment into third countries flows via the headquarters. These countries are typically characterised by large inflows and outflows relative to GDP. Belgium and Luxembourg, for example, had inflows and outflows of around \$250 billion in 2000; equivalent to more than 300 per cent of GDP, compared with 50 per cent in Germany and 90 per cent in the UK. That Belgium and Luxembourg have typically received a large amount of FDI relative to their size is underlined by the UNCTAD inward FDI index<sup>b</sup> which measures this ratio. Belgium and Luxembourg took first place between 1998 and 2000, whereas the UK was ranked 25th. This did not mean, however, that the UK performed poorly; it was ranked higher than any other G7 country during this period.<sup>c</sup>

<sup>a</sup> The 10 per cent rule is an internationally-agreed convention. In the UK, for example, the ONS adopted this definition in 1997, having previously assumed a convention of 20 per cent. The effect on the statistics was minimal and pre-1997 data have not been revised to reflect this change.

<sup>b</sup> The UNCTAD inward FDI index measures the ratio of a country's share in global FDI flows to its share of global GDP (UNCTAD, 2002).

<sup>c</sup> G7 rankings: US (74th); Canada (30th); Germany (43rd); France (69th); Italy (115th) and Japan (131st).

## (i) Trends in FDI stocks

**4.44** FDI stocks are the net accumulation of FDI flows plus annual revaluations, and tend to give a more stable measure of FDI than do flows. They can, however, be less useful than flows in identifying recent trends, as the complexities in constructing the data mean they are typically less timely and can be distorted by revaluations.

### FDI stocks compared

**4.45** As illustrated in the stylised facts above, the UK is a global force in terms of both inward and outward investment. The UK has historically received large amounts of inward FDI; UK inward investment stocks were only slightly lower than those of the US in 1980 (see Table 4.6). By 1985, however, UK FDI stocks had fallen behind the US, but were still much higher than in Germany. Although Germany has subsequently caught up with the UK, the UK had the second largest stock of inward investment in the world in 2001 and the largest of any EU economy (Table C7 in Annex C provides a breakdown of EU FDI stocks by sector).

**Table 4.6: Inward investment stocks, selected countries**

US\$ billion	UK	Germany	US	World total
1980	63	37	83	636
1985	64	37	185	913
1990	204	120	395	1,872
1995	200	193	536	2,912
2001	497	481	1,321	6,846

Source: UNCTAD, 2002.

**4.46** As highlighted in Section 2, US FDI forms a larger proportion of UK FDI stocks than it does of FDI stocks of other large EU Member States. The UK consequently has a relatively high share of extra-EU FDI in its overall FDI stocks. Shares from Asia and Japan are, however, broadly similar to those of the EU as a whole.

### Sectoral FDI stocks in the UK and EU

**4.47** Sectoral breakdowns of FDI are even more prone to the data interpretation problems outlined in Box 4.2 than are the aggregate figures. As was shown in Section 2, the UK has a large share of the EU inward investment stock in sectors such as ‘mining and quarrying’, ‘electricity, gas and water’, ‘hotels and restaurants’ and ‘transport, storage and communication’. As a proportion of national FDI stock, the UK is relatively strong in ‘financial intermediation’, ‘manufacturing’ and ‘transport, storage and communication’.

**4.48** Nevertheless, it is possible to consider changes in inward investment stock across individual sectors since the introduction of the euro. The lack of sector information from many Member States means that it is not possible to produce a reliable euro area figure. However, the UK can be compared with a limited number of countries. France and Germany, being of comparable size, are used here.

**4.49** Taking a similar approach to the sectoral trade analysis, this analysis looks at differences between the change in average annual growth of UK FDI stocks in the years before and after EMU, compared with France and Germany. This analysis compares annual average growth over the three years before EMU (1996-1998) with annual average growth in the period since EMU (constrained by data availability to the two years 1999 and 2000).

**4.50** Tables 4.7 and 4.8 compare, for intra-EU FDI and extra-EU FDI respectively, the difference between the rise (or fall) in average annual UK FDI stock growth since EMU and the change in French and German average annual FDI stock growth. A positive number indicates a more rapid acceleration (or a slower deceleration) in UK FDI stocks, since EMU; a negative number indicates sectors in which, comparing post-EMU with pre-EMU performances, French or German FDI growth has outpaced that of the UK.

**4.51** A simple example may aid interpretation of these results. Average annual growth in the UK's stock of 'hotels and restaurants' FDI from the EU was 12 per cent between 1999 and 2000, and 35 per cent between 1996 and 1998. This represents a slowing of the growth rate of 23 percentage points between the two periods. Average annual growth in Germany's stock of 'hotels and restaurants' FDI from the EU was 5 per cent before EMU, and 10 per cent after. This represents an increase in the growth rate of 5 percentage points. Thus the difference between the UK's fall and Germany's rise in the growth rate is minus 28 percentage points (see Table 4.7). The minus sign in the table reflects the fact that the growth rate of the UK's stock of EU FDI in the 'hotels and restaurants' sector increased more slowly between the two periods than did the equivalent growth rate for Germany.

**Table 4.7: Difference in average annual growth in intra-EU FDI stocks in the UK, France and Germany, 1996-1998 and 1999-2000**

	Percentage point difference between average annual growth in UK intra-EU inward investment stock, and growth in:	
	France	Germany
Agriculture	–	–
Mining	<b>280</b>	–26
Manufacturing	<b>9</b>	–9
Electricity, gas and water	–33	–14
Construction	<b>89</b>	<b>91</b>
Trade and repairs	<b>68</b>	<b>58</b>
Hotels and restaurants	–13	–28
Transport, communications	–168	–305
Financial intermediation	<b>27</b>	<b>26</b>
Real estate and business activity	<b>123</b>	–9
Computer, research, other business	<b>117</b>	–4

*Note:* shows the difference between the average annual growth in UK intra-EU FDI before and during EMU (1996-1998 and 1999-2000) minus the difference between the average annual growth in France or Germany over the same time periods. See Box 4.1 for more details of this methodology. A positive number, highlighted in bold indicates that the change in the growth of UK stock of intra-EU FDI between the two periods exceeded that in France or Germany.

*Source:* Eurostat; HM Treasury calculations.

– equals one or more years of negative FDI stocks during the period.

**4.52** As Table 4.7 shows, Germany outperformed the UK in terms of intra-EU FDI stocks in the majority of sectors, with the largest differential coming in 'transport and communication'. France outperformed the UK in only a minority of sectors, though both France and Germany led the UK in 'transport and communications', 'hotels and restaurants' and 'electricity, gas and water'. (The potential for large M&A deals to distort such data must, however, be kept in mind.)

**Table 4.8: Difference in average annual growth in extra-EU FDI stocks in the UK, France and Germany, 1996-1998 and 1999-2000**

	Percentage point difference between average annual growth in UK extra-EU inward investment stock, and growth in:	
	France	Germany
Agriculture	<b>42</b>	<b>62</b>
Mining	-36	<b>15</b>
Manufacturing	<b>4</b>	<b>1</b>
Electricity, gas and water	-	-148
Construction	<b>372</b>	<b>347</b>
Trade and repairs	<b>35</b>	<b>38</b>
Hotels and restaurants	<b>22</b>	-35
Transport, communications	-40	-78
Financial intermediation	-1	-9
Real estate and business activity	<b>33</b>	-39
Computer, research, other business	<b>16</b>	-36

Note: shows the difference between the average annual growth in UK extra-EU FDI before and during EMU (1996-1998 and 1999-2000) minus the difference between average annual growth in France or Germany over the same time periods. See Box 4.1 for more details of this methodology. A positive number, highlighted in bold, indicates that the change in the growth of UK stock of intra-EU FDI between the two periods exceeded that in France and Germany.

Source: Eurostat; HM Treasury calculations.

- equals one or more years of negative FDI stocks during the period.

**4.53** In terms of extra-EU FDI stocks as Table 4.8 shows, Germany experienced stronger growth than the UK in around half of the sectors identified, while France experienced stronger growth in three out of the ten sectors for which data are available. Both countries once again experienced stronger growth than the UK in 'transport and communications'.

## (ii) Recent trends in global FDI flows

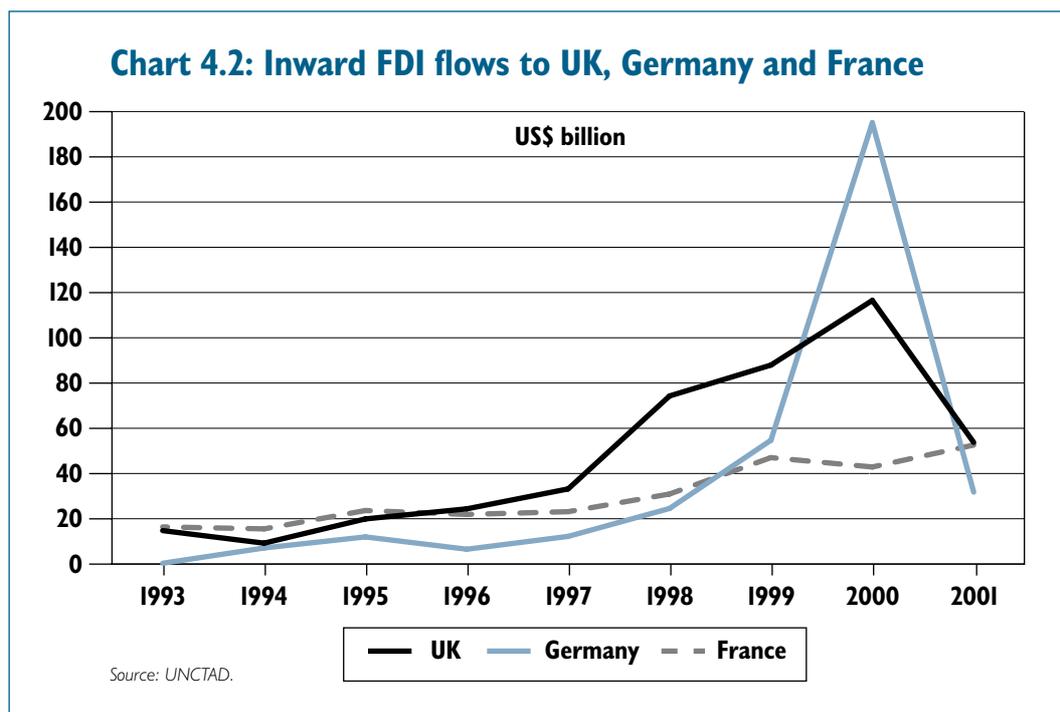
**4.54** Global FDI flows rose almost ten-fold between 1991 and 2000, to US\$1.5 trillion a year. This was a time of unprecedented M&A activity. Reported M&A activity accounted for around three quarters of global investment flows in 2000, compared with around half in 1991. During 2001, however, world investment flows fell by 50 per cent to US\$740 billion as economic growth slowed and reported M&A activity also declined sharply.

**4.55** The UK, US, and Germany all experienced sharp increases in FDI activity between 1991 and 2000. Having been major beneficiaries of global FDI, they were subsequently among the most affected by the global downturn in FDI in 2001. Inward investment flows fell by 54 per cent in the UK, 59 per cent in the US and 84 per cent in Germany (reflecting in part, the strong M&A activity of 2000, considered below). France, in contrast, saw FDI increase in 2001, though this was in comparison with a 9 per cent fall in the previous year.

**EU FDI flows** **4.56** The EU saw a significant increase in its share of global FDI flows during the 1990s. UNCTAD (United Nations Conference on Trade and Development) data show that:

- in 1985, the EU received less than a third of global FDI flows. This had increased to over 50 per cent by 2000, before falling back slightly in 2001; and
- the EU accounted for less than a third of the global FDI stock in 1985. This increased to around 40 per cent during the 1990s, and has since remained relatively stable.

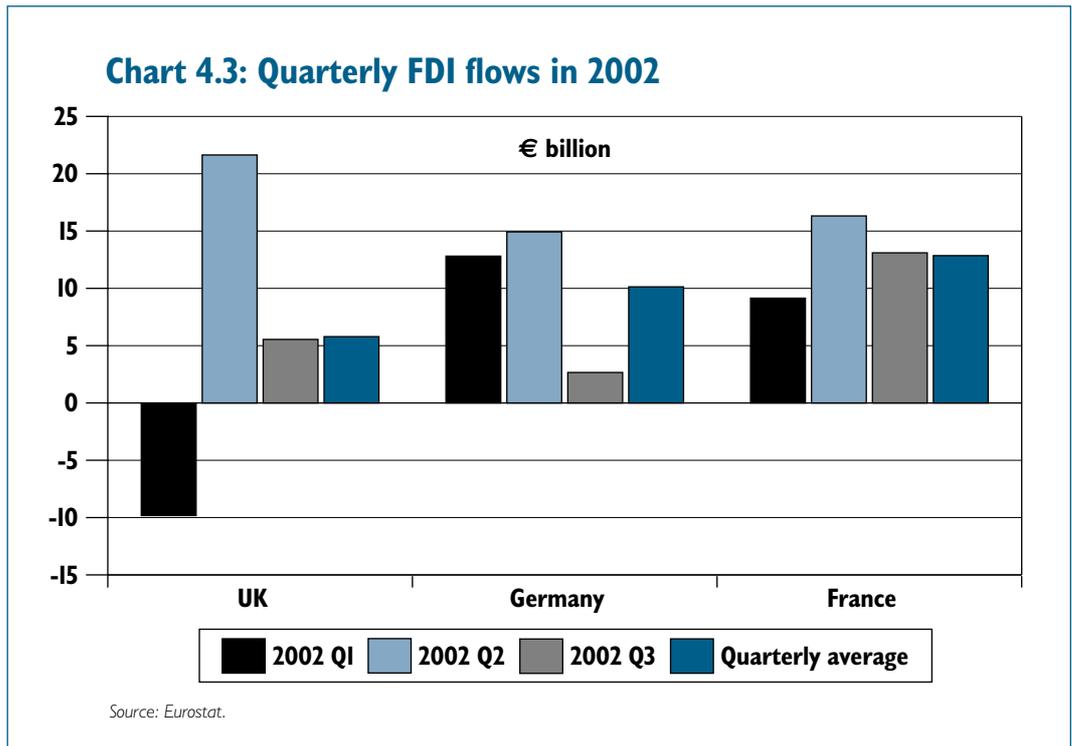
**UK FDI flows** **4.57** For the UK as for the EU, the late 1990s saw significant growth in FDI inflows. Chart 4.2 shows inflows into the UK, Germany and France. The peak in German FDI in 2000 largely reflects the acquisition of Mannesmann by Vodafone. This transaction is recorded as UK outward investment. As such, it affects the UK's position in any ranking of FDI inflows (by boosting other countries inflows relative to the UK's) as well as the UK's net FDI flows for the year.



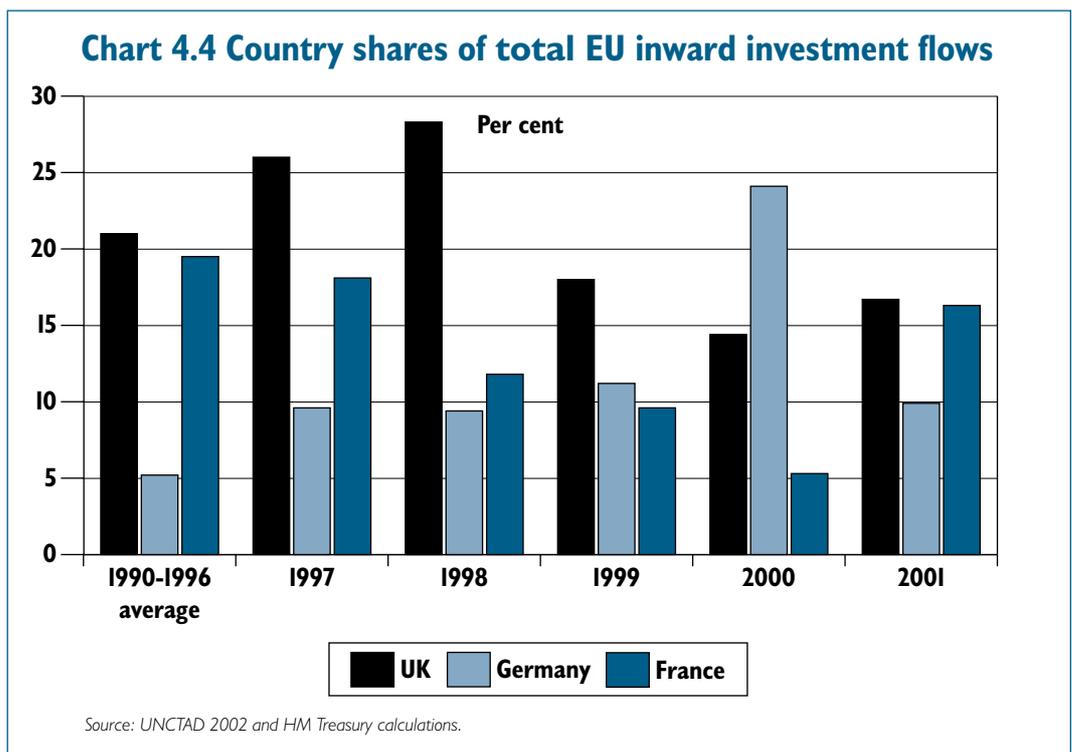
**The situation in 2002** **4.58** The fall in UK inward FDI in 2001 is mirrored in other countries; the UK's 54 per cent drop is broadly matched by a fall of 60 per cent for the EU as a whole. Although 2002 data are not yet available, recent UNCTAD projections suggest that, in 2002, the UK experienced the largest decline in FDI flows among developed nations, with inward investment falling by 75 per cent (from US\$54 billion to US\$12 billion).

**4.59** These are, however, projections not hard data. FDI flows are inherently volatile and are very difficult to predict and reconcile with any accuracy; reliance is placed on past data to help draw inferences about future values. As Chart 4.3, based on Eurostat flows data shows, the UK experienced negative FDI flows in the first quarter of 2002. This depresses the total and average figures for the year to date, and is not indicative of normal quarterly FDI flows,<sup>11</sup> more likely representing large financial movements within a single company. FDI flows subsequently recovered in the second quarter before falling back in the third (as was also the case in France and Germany).

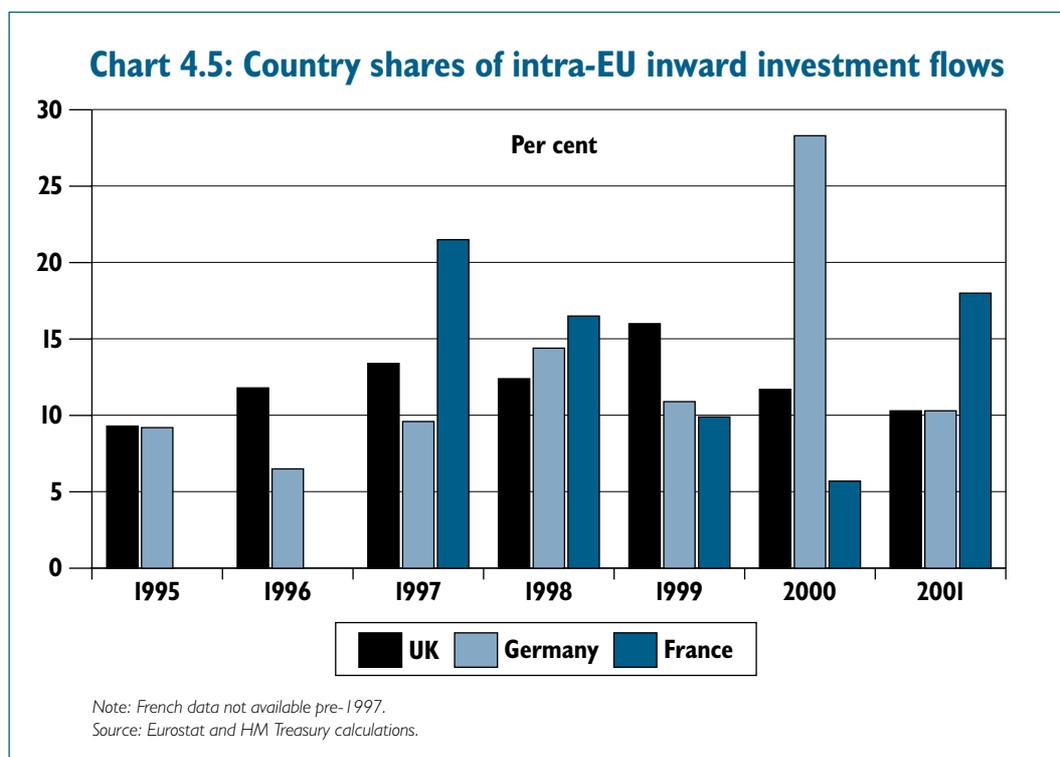
<sup>11</sup> The UK has recorded negative FDI inflows in only 6 out of the 159 quarters observed since records began in 1963.



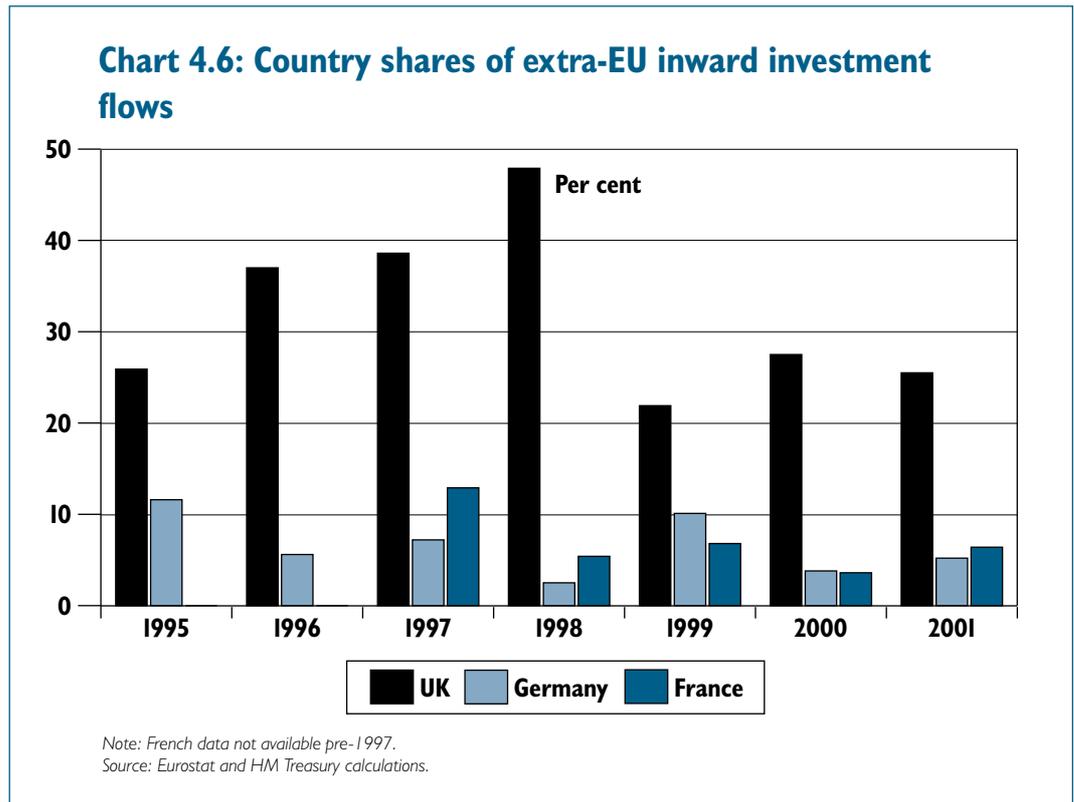
**UK share of EU FDI** **4.60** Chart 4.4 compares the UK share of total inward FDI (both intra and extra-EU) with that of France and Germany. The UK's share fell from 28 per cent in 1998 to just under 17 per cent in 2001. Part of the decline may reflect the rapid growth in the FDI share of Belgium and Luxembourg (not illustrated, but which grew from 9 per cent in 1998 to almost 30 per cent in 1999 and 2000, possibly due to factors such as the structure or location of company headquarters – see Box 4.2) and the 2000 acquisition of Mannesmann by Vodafone.



**Intra-EU FDI 4.61** Decomposing inward FDI into its intra-EU and extra-EU constituent parts helps to cast some light on the causes of the UK's recent loss of share. Chart 4.5 shows the shares of the UK, Germany and France in intra-EU FDI, i.e. cross-border investment within the EU. Within a very volatile picture, the UK's share of intra-EU FDI has overall kept pace with that of France and Germany; sometimes higher than one or the other, sometimes lower, but broadly constant. Notwithstanding its decline in 2000 and 2001, the UK's share of intra-EU FDI remains above that of 1995.



**Extra-EU FDI 4.62** Chart 4.6 shows the UK, German and French shares of extra-EU FDI flows, i.e. investment from non-EU countries. The UK is a major recipient of non-EU FDI flows, its share peaking at almost 50 per cent of the EU share in 1998. While the UK's share has since been eroded, the bulk of the decline was concentrated in just one year, 1999, and appears since then to have stabilised at higher levels than for either Germany or France.

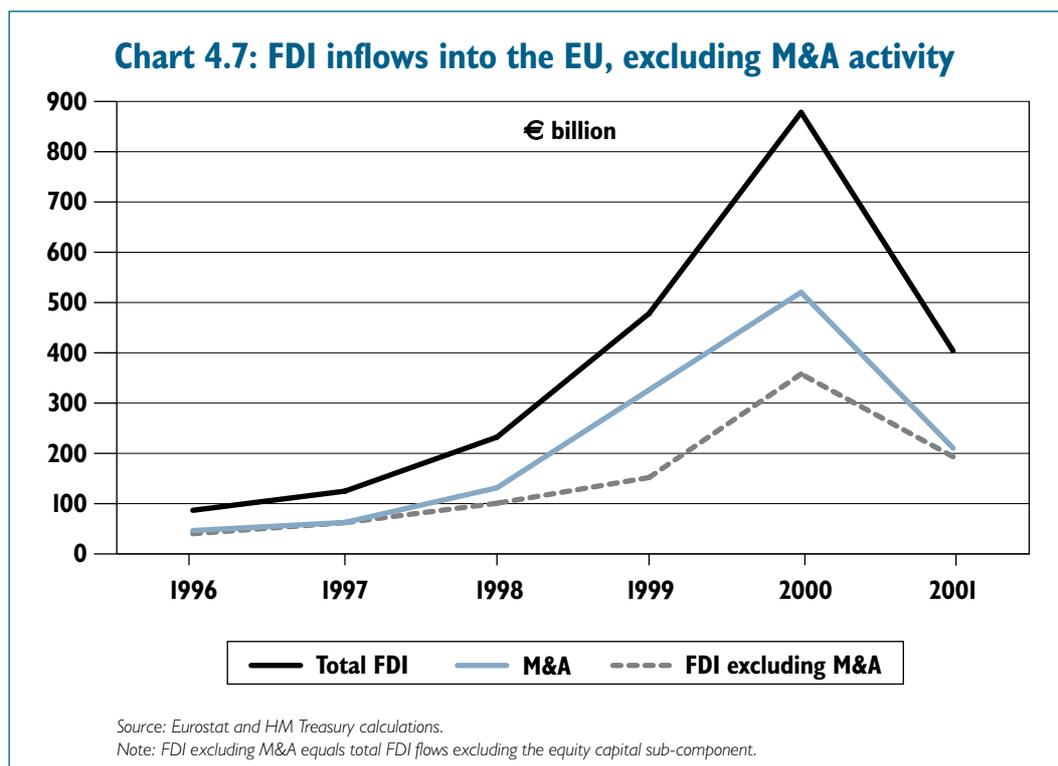


**4.63** The UK's loss of extra-EU FDI share in 1999 was substantial, at 26 percentage points, and compares with gains in Germany and Belgium (8 percentage points each), Ireland (7 percentage points) and Spain (6 percentage points). Investment into the UK from outside the EU fell in this year by 52 per cent. At the same time, however, investment into the UK from inside the EU increased (Chart 4.5).

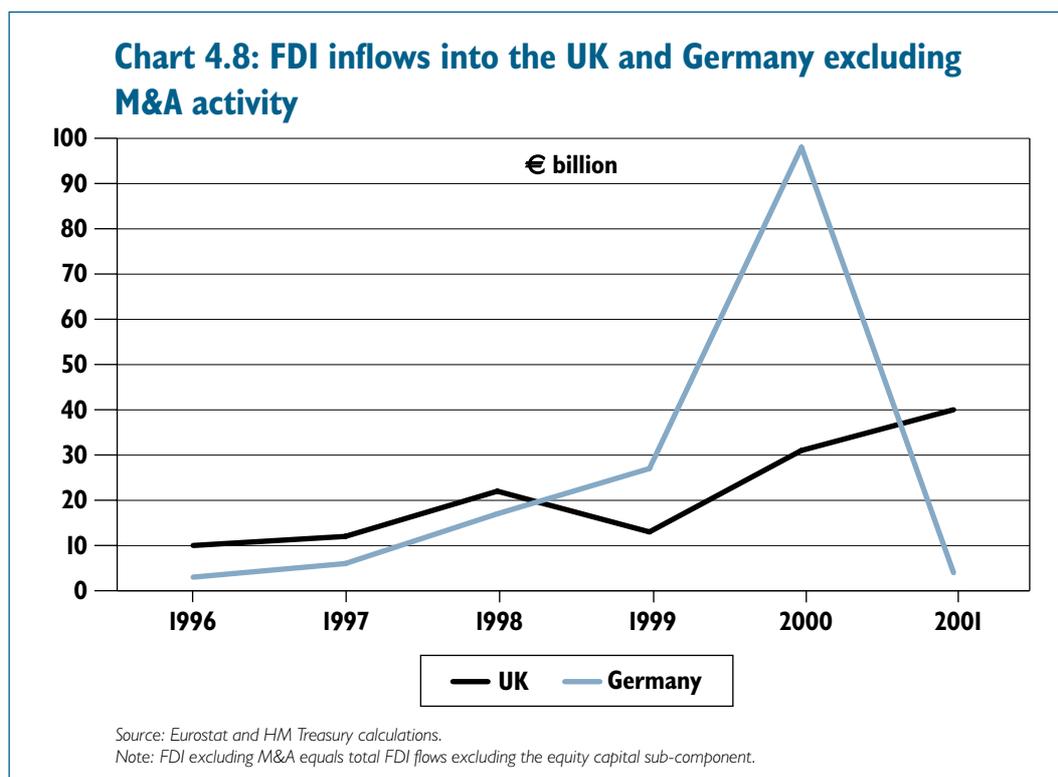
**Mergers and acquisitions** **4.64** It is not possible, using official flow data, to extract M&A data directly from FDI data. Information on M&A activity relies on reported values and can often be mis-stated.<sup>12</sup> However, it is possible to approximate the level of inward FDI flows, excluding M&A, by extracting the equity capital sub-component from the overall FDI statistics (see Box 4.2 for definition). The drawback of this approach is that other transactions may inadvertently be excluded, such as the purchase of domestic subsidiaries' shares by a foreign parent company, and inter-company transactions associated with M&A might still be captured even after the equity capital component is excluded. As, however, M&A tends in practice to dominate the equity capital account, this method provides a reasonable proxy for comparisons.

**4.65** As Chart 4.7 shows, M&A activity has become an increasingly important source of EU investment inflows into the EU since 1998. The introduction of the euro may have promoted this wave of expansion and consolidation, though global demand, market conditions and sector-specific factors (especially in telecommunications) are more likely to have been the main driving factors. A list of the 20 largest M&A deals in 2000-01 is included in Annex C (Table C8), as are country breakdowns of M&A activity by European country (Tables C9 and C10).

<sup>12</sup> Inward M&A activity for the UK in 2001 reported by UNCTAD, for example, exceeds total inward FDI by around \$15 billion dollars. While this is theoretically possible, it would require a huge outflow from another part of the inward FDI account.



**4.66** Underlying inward investment excluding M&A continued to rise in the UK after 1999, but fell sharply in Germany (see Chart 4.8).<sup>13</sup> M&A tends to be sensitive to the investment behaviour of a relatively small (though increasing) number of countries. The US, the UK, Germany, France and the Netherlands accounted for 82 per cent of international M&A in the 1990s (OECD, 2001a). Most of the M&A inflow into Europe – almost two thirds – was intra-European, stemming in particular from France, the UK and Germany.



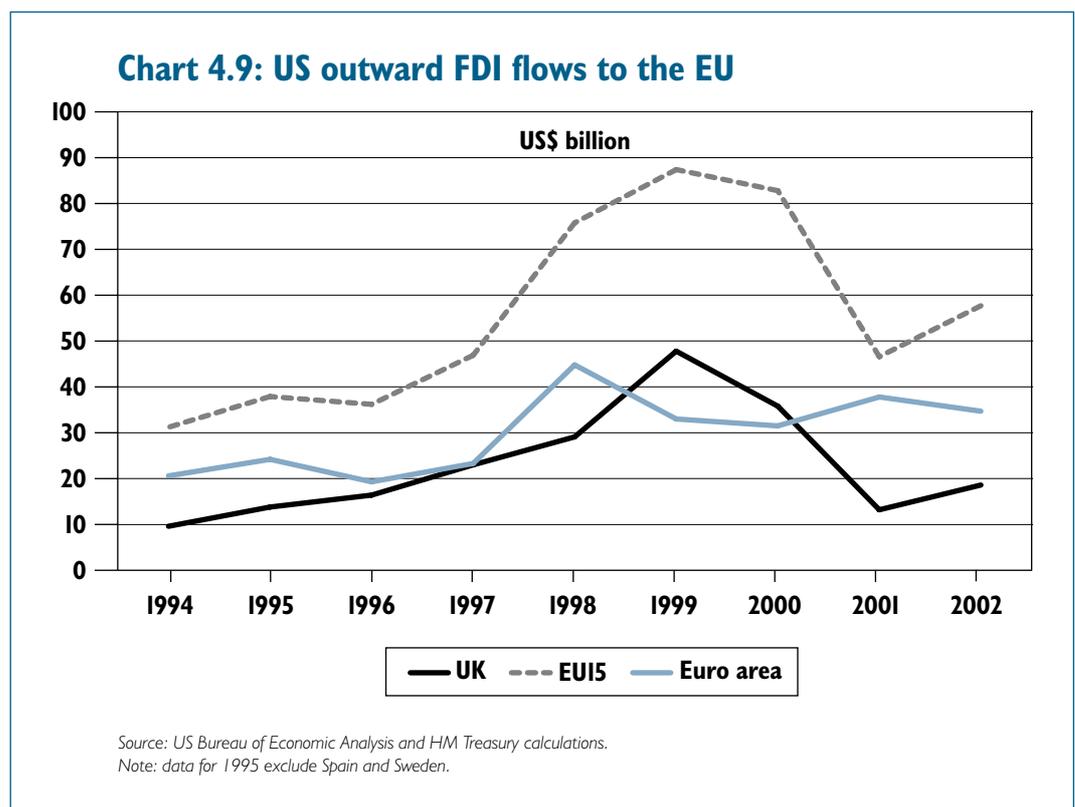
<sup>13</sup> Inter-company transactions associated with large amounts of M&A may not be excluded from these figures.

**US FDI into the UK and EU** **4.67** Detailed data on bilateral FDI flows are generally unavailable. However, data on US investment outflows are published (with some data points withheld to avoid revealing commercially-sensitive information on individual cross-border investments).<sup>14</sup>

**4.68** The US was the world's largest outward investor in 2001, accounting for almost a fifth of world outflows. Of the US\$114bn invested abroad by the US in 2001, around 40 per cent went to the EU as a whole. The UK attracted a quarter of this (second only to the Netherlands).

**4.69** While the UK has traditionally been a leading recipient of US FDI, there is some recent evidence that euro area countries have been attracting a growing proportion of this investment. US FDI flows into euro area countries held up relatively well during the global slowdown in 2001, whereas flows into the UK and the total EU15 fell sharply, as shown in Chart 4.9.

**4.70** US FDI into the UK fell by around 60 per cent in 2001. Around half of the fall was due to weaker investment in the 'finance, insurance and real estate'<sup>15</sup> sector, due to the global economic downturn and falling stock markets. The remaining weakness was concentrated in the 'other industries' grouping. Interestingly, manufacturing investment flows from the US to the UK actually increased in 2001.



<sup>14</sup> Data provided by the US Bureau of Economic Analysis.

<sup>15</sup> Excludes depository institutions.

**4.71** Table 4.9 compares by sector the change in US FDI stocks in the UK and the euro area between 1998 and 2001. It shows broadly similar performance across most industries. The UK's growth was lower than that of the euro area in 'petroleum', 'service industries' and 'manufacturing' and higher in 'depository institutions' and 'finance, insurance and real estate' (Tables C11, C12 and C13 in Annex C provide further detail on US FDI stocks and flows by sector).

**Table 4.9: Growth in US FDI stock in the UK and euro area, 1998-2001, historic-cost basis**

Per cent (US\$ billion in 2001)	UK	Euro area
Total	36 (249)	35 (367)
Petroleum	-35 (12)	-10 (7)
Manufacturing	31 (55)	34 (129)
Wholesale trade	11 (8)	11 (25)
Depository institutions	24 (13)	18 (7)
Finance, insurance and real estate	52 (110)	47 (157)
Services	37 (17)	44 (30)

Source: US Bureau of Economic Analysis.

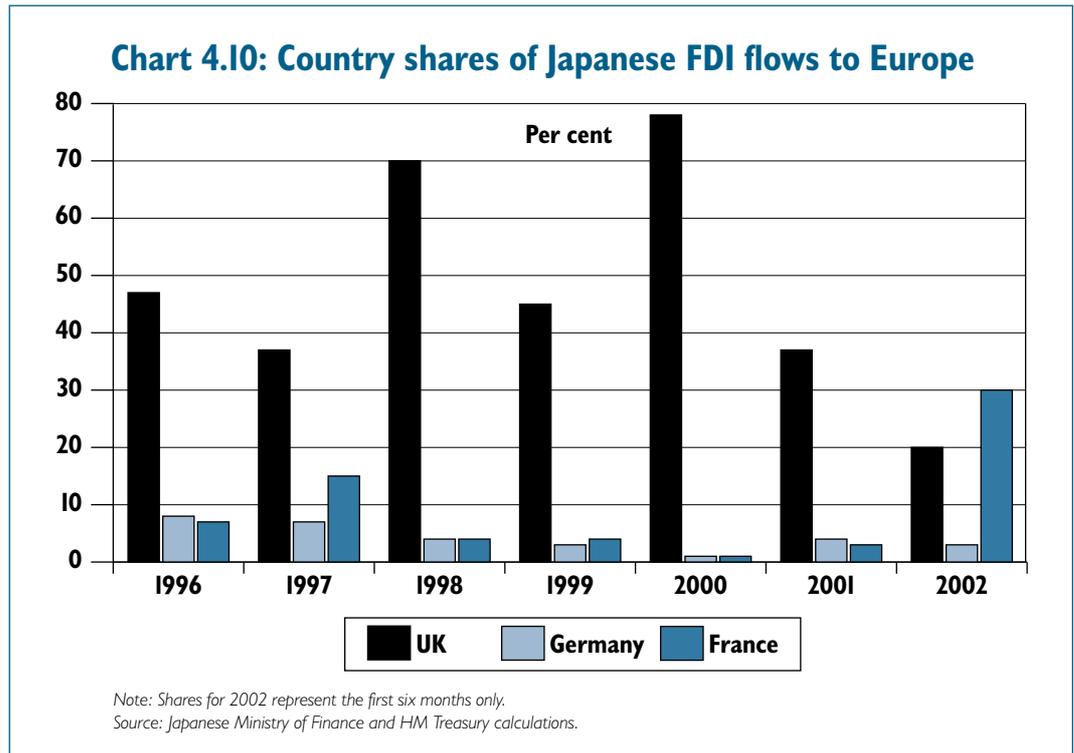
#### Japanese FDI into the UK and EU

**4.72** Japanese investment outflow data are also available. Japanese capital invested in the UK and the rest of EU represents only a small proportion of EU FDI stocks and tends to be concentrated in sectors such as car production and electrical goods. Japanese investment in the UK accounted for a little over 1 per cent of total inward investment flows in 2001, but has historically been considerably higher, accounting for 7 per cent of UK FDI inflows in 2000 and 12 per cent in 1990.

**4.73** The UK received 13 per cent of total Japanese outward investment in 2001, over a third of Europe's total share.<sup>16</sup> The UK's share of total Japanese outward investment flows fell, however, to 9 per cent in the first half of 2002. Investment flows into France during the same period accounted for 14 per cent of the Japanese total, up from only 1 per cent in 2001.

**4.74** The provisional half-year data for 2002 suggest sharp swings in Japanese investment flows, and as such should be treated with a degree of caution. They indicate that France's share of Japanese inward investment into Europe (see Chart 4.10), rose from less than 5 per cent in 2001 to around 30 per cent in the first half of 2002, while the share received by the UK and Germany declined. However, total FDI flows into the UK from Japan were higher in the first six months of 2002 than in the corresponding period in 2001. The increased FDI into France from Japan seems to reflect higher-value projects rather than a larger number of projects.

<sup>16</sup> Data for EU total not available. All data from Ministry of Finance, Japan: <<http://www.mof.go.jp/english/e/c008.htm>>.



### (iii) Project numbers

**4.75** Given the difficulties in using FDI data to assess the possible impact of EMU, project numbers based on surveys and interviews with actual and potential investors provide a valuable alternative source of information.

**Invest UK annual review** **4.76** The Invest UK annual review provides some details of the number of inward investment projects started in a financial year and the sector that the project is in. It can also provide an indication of the level of 'greenfield' investment into the UK economy, so avoiding some of the difficulties discussed in Box 4.2, although it does not measure the value of these projects. The review indicates that the number of projects in the financial year 2001-02 fell by 12 per cent on the previous year to 764 and the number of new jobs created fell by 52 per cent to 34,087. The largest number of projects from a single country was the US, with 288 projects creating 13,750 new jobs. EU countries accounted for around a third of the total projects and over 11,000 jobs.

**4.77** Almost 40 per cent of these projects were new ventures and the remainder were shared equally between mergers and expansion. Around a third of the new projects into the UK in 2001-02 were in the ICT sector – still featuring heavily despite its global weakness during this period – and a significant proportion (almost 10 per cent) were in the automotive sector. Invest UK cites the continuing success of the UK in attracting inward investment as reflecting its record of economic stability, low taxes, workforce flexibility and know-how, science and technology expertise, R&D excellence and high skill levels and creativity. This list is very similar to the key drivers of FDI outlined in Section 3.

**4.78** In a recent interview with the Financial Times (2003a), William Pedder, chief executive of Invest UK, stated that worries about the impact of the UK being outside of the euro did not appear to be reflected in estimates of inward investment projects for the first six months of the 2002 financial year. He noted that “*There are a huge range of views about the euro, depending on the activities in which companies are engaged*”. Mr Pedder stated that the number of inward investment projects in the first six months of the year had remained at similar levels to the previous year but the number of new jobs created had declined. He noted that new investments were increasingly in smaller, but higher-value projects, which in many cases attract higher value jobs.

**Ernst and Young  
project  
information**

**4.79** Ernst and Young’s (2002) *European Investment Monitor* provides a useful supplement to Invest UK project data. This survey counts the number of inward investment projects for all EU countries, thereby providing useful comparisons across countries. It also breaks the numbers down by sector and source.

**4.80** According to this source, between 1999 and 2001, the UK received the highest number of inward investment projects in Europe – a fifth of all projects. While the share fell from 26 per cent in 1999 to 19 per cent in 2001, it remained considerably above that of the second-ranked country, France (13 per cent). In the first six months of 2002, however, the UK’s share declined to 16 per cent while that of France was unchanged at 13 per cent. In the absence of data on the value of these projects, it is not possible to estimate what the falling number of projects implies for their overall value to the UK economy.

#### **(iv) Survey evidence**

**4.81** A recent survey (Financial Times, 2003b) of 40 foreign manufacturers in the UK employing 62,000 people highlighted concerns about UK membership of EMU. Around 61 per cent of the respondents willing to give their views said they were less likely to invest in the UK if it failed to decide whether to join the euro. The remaining 39 per cent said that the single currency would make little difference. More than half of those in favour of UK entry to EMU were firms based in euro area countries, compared to only a third of those with no preference.

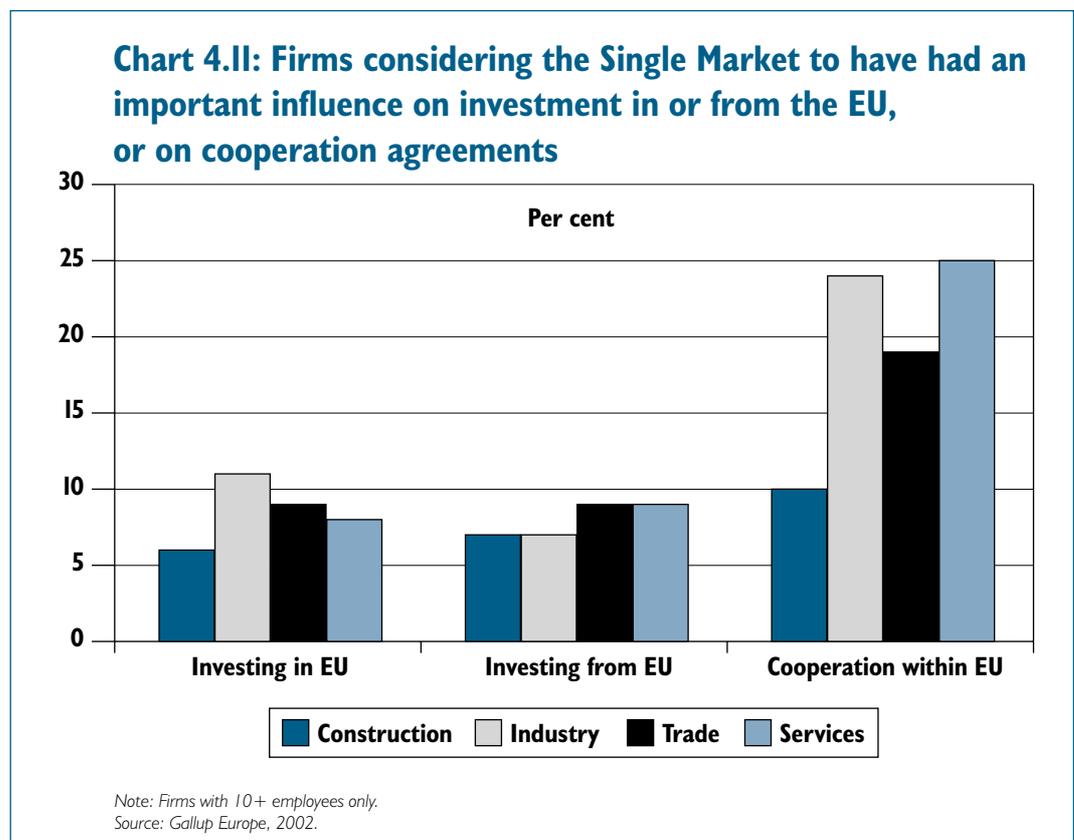
**4.82** The *FDI Confidence Index* (AT Kearney, 2001) asked business executives what factors might undermine the UK’s global position as an FDI location. Half of all continental European executives who were asked said that a decision not to join EMU was the most important factor which would lead them to reconsider investing in the UK. The sterling-euro exchange rate was the second most important factor, while ongoing uncertainty over joining EMU ranked third. Over half of the European executives surveyed stated that a UK decision not to join the euro would dissuade them from investing in the UK. North American executives, in contrast, were primarily concerned with European and US economic growth.

**4.83** Not all surveys, however, draw the same conclusions. Some find the UK EMU decision to be of limited importance even to euro area inward investors. A recent survey of German investors into the UK by the German-British Chamber of Industry & Commerce (2003), for example, found that 78 per cent of parent firms considered that the UK remaining outside the euro would have no effect on their future investment, with similar figures for their UK subsidiaries. 84 per cent of subsidiaries viewed UK participation in the euro in the next three to five years as beneficial, although only 56 per cent believed that UK entry would benefit their own companies.

### The impact of the Single Market on investment

**4.84** The period surrounding the implementation of the SMP may provide some guidance on the possible implications of the euro for FDI. FDI flows appear to have grown after 1992, especially intra-industry and intra-EU flows. In the early 1980s, the EU accounted for around a quarter of worldwide FDI. By 1993 this had risen to 44 per cent, of which around 60 per cent was intra-EU compared with 40 per cent a decade earlier (European Commission, DG Internal Market 1996a). By 2000, the EU's share of global FDI flows was over 50 per cent, though it fell back slightly in 2001.

**4.85** From the perspective of the individual firm, however, the effect of the SMP on cross-border investment within the EU appears to have been more muted, at least insofar as is indicated by responses to the 2002 *Internal Market Scoreboard* (see Chart 4.11). As the chart also shows, however, the SMP is viewed as having been extremely influential in facilitating cooperation agreements, especially in the services sector.



### Is a euro effect discernible?

**4.86** In drawing any conclusions about FDI and the potential impact of the decision on EMU, it is important to recap on the key facts from the above analysis:

- **the UK is a major recipient of FDI.** The UK had the second largest stock of inward investment in 2001, higher than any other European country and second only to the US. The UK also had the second largest inflow of inward investment in the world in 2001;
- **the UK is a major outward investor** and had the second largest stock of outward investment in the world in 2001;

- **the UK's share of inward investment in the EU has weakened since 1998.** This has been most marked in extra-EU FDI;
- **the UK is a major recipient of US and Japanese FDI flows.** The UK received 10 per cent of US flows and 13 per cent of Japanese flows in 2001. This is more than any other EU country, apart from the Netherlands; and
- **mergers and acquisitions can distort the FDI picture in any one year.** The recent boom and contraction in M&A activity makes it extremely difficult to discern underlying trends.

**4.87** Some particularly interesting developments in EU FDI flows took place in 1999. Three significant shifts occurred:

- **extra-EU FDI flows into the UK fell** by 52 per cent and the UK's share of extra-EU FDI fell by 26 percentage points. Since then, the UK share has remained relatively constant;
- **extra-EU FDI into some euro area countries increased sharply**, in particular to Germany, Belgium, Ireland and Spain. The German and French shares have since fallen back slightly; and
- **intra-EU FDI into the UK increased** and the UK's share of EU inward investment flows increased by 4 percentage points. Since then, however, the UK's share has declined.

**4.88** One explanation for these developments could be that firms from outside the EU, which would previously have invested in the UK to access EU markets have been diverted to euro area economies by the lower barriers to trade stemming from EMU. This would be consistent with both the fall in extra-EU FDI to the UK and the increase to euro area economies. At the same time, and against a background of increasing world flows, EU firms still needing to access UK markets continued to invest in the UK.

**4.89** There is, however, no shortage of alternative explanations. The UK's share of extra-EU FDI increased sharply between 1995 and 1998. Subsequent developments may simply reflect a return to a more 'normal' level. It is unlikely that the UK could have expected to attract around half of all outside investment into the EU over the medium term, and at around 25 per cent, the UK's share remains large.

**4.90** M&A activity complicates the analysis further.<sup>17</sup> M&A has become increasingly important in the EU since 1998 and this development, which reflects a range of global, financial and sectoral factors, may have dwarfed any euro effect. Excluding M&A activity from UK and German FDI flows suggests that UK inward investment continued to rise in 2001, while German inward investment contracted sharply. FDI flows to Germany were, however, much higher in 2000 than those to the UK. These sharp movements in M&A may also have distorted relative movements in intra and extra-EU FDI shares.

**4.91** US FDI flows to the UK, EU and euro area countries suggest that US investment to the euro area has performed better during the downturn than that to the UK. However, with just a few years' data available, it is too early to gauge with any confidence the effects of EMU membership on US inward investment, except to note that the euro itself does not appear to have dampened such flows. The growth of US FDI stocks by industry between 1998 and 2001 show little significant difference between the euro area and the UK.

<sup>17</sup> For more information on M&A, see OECD (2001a).

**4.92** The UK's share of Japanese investment into Europe almost halved from 38 per cent in 2001 to 20 per cent in the first half of 2002. However, total FDI flows from Japan into the UK were higher in the first half of 2002 than in the first half of 2001.

**4.93** The lower volatility of FDI stocks data means that it can assist in the analysis of sectoral patterns post-EMU. This analysis, albeit highly tentative, suggests several sectors where FDI stocks in Germany and France have grown more strongly than in the UK, including 'electricity, gas and water', and 'transport and communications'

**Looking forward 4.94** As the EU enlarges, the new Member States may experience a boost to inward investment flows as a result of EU membership (Bevan *et al.*, 2001) placing further downward pressure on the FDI shares of other EU countries and boosting outflows of existing EU members. The prospect of full membership of the EU, free access to the Single Market in most sectors and the opportunities arising from privatisation and deregulation, have already increased the attractiveness of these countries to investors. While the new Member States account for a relatively small proportion of the world's FDI inflows, they have managed to avoid the full effects of the recent contraction in global FDI. World FDI inflows fell by 50 per cent in 2001, while flows into the new Member States fell by only 2 per cent. Their share of world FDI accordingly increased from 1.4 per cent to 2.7 per cent and UNCTAD expects this resilient performance to have been repeated in 2002.

**Conclusions on FDI and EMU 4.95** This section has used the available evidence to analyse whether there has been a euro effect on FDI into the UK and the euro area to date. There is evidence that the UK's share of FDI from outside the EU has fallen relative to other EU members since the introduction of the euro. This must, however, be considered against a backdrop of factors such as the rapid global increase in FDI over the late 1990s, largely driven by M&A activity, and the sharp fall since 2000, as well as the UK's leading position within Europe in terms of inward investment. It is difficult to detect with any confidence a specific EMU effect. These issues are considered further in the investment test – the third of the Government's five economic tests for EMU entry.

## CONCLUSIONS ON THE SHORT TO MEDIUM-TERM EFFECTS

**4.96** The analysis in this section is consistent with (or does not contradict) the theoretical discussion in Section 3 which suggested that EMU could be expected to foster increased trade, investment and cross-border investment. The analysis of sectoral trade flows in this section also provides some support to the theoretical discussion of the sectoral characteristics which may influence the impact of EMU on different sectors.

**4.97** The next section considers the evidence on the longer-term effect of EMU on competition, specialisation and concentration. Section 6 draws together the analysis of both the theory and evidence, with a forward-looking discussion of how EMU could affect different industries, depending on specific sectoral characteristics.



EMU's potential long-term effects are, by definition, not yet evident. This does not, however, preclude informed judgement as to the direction they might take, based on evidence to date.

Economic theory, the Single Market Programme (SMP) and US experience highlight increased competition as the primary long-term consequence of EMU. There are some indications of price convergence in the EU through the 1990s and evidence from the US suggests that mature currency unions exhibit lower price divergence. Exchange rate movements, however, make it difficult to discern an EMU effect to date. If EMU furthers the implementation of the SMP and the integration of EU labour, product and capital markets, it should promote competition and greater economic efficiency.

Evidence suggests that EMU will augment existing tendencies towards greater specialisation. The EU appears less specialised than the US, making it relatively less vulnerable to asymmetric sectoral shocks stemming from industry structure. A slow increase in EU specialisation has, however, been apparent over recent decades and appears to have been encouraged at a national level by EU entry.

Geographical concentration in manufacturing presents a mixed picture, with strong sectoral variations. At the level of the overall economy, however, the expansion of the generally more dispersed service sector exercises a dampening influence on geographical concentration.

**5.1** The short to medium-term effects of EMU, described in Section 4, will have longer-term consequences for the industrial structure of the euro area.

**5.2** These longer-term effects are, by definition, not yet evident. It is, however, possible to set the theoretical long-run implications identified in Section 3 in the context of current euro area, EU and global developments. Prices data, anecdotal evidence and the experience of the Single Market Programme (SMP) can cast light on the impact of EMU entry on **competition**. While it is more difficult to isolate early indications of the impact of the euro on **specialisation** and **concentration**, an analysis of established trends, past periods of EU integration, Member States' experience post-EU entry and US experience can all contribute to an informed judgement.

## TRENDS IN COMPETITION

**5.3** This sub-section considers evidence on trends in competition; first, by reference to contemporary euro area price data; second, by comparisons of the EU and the US; and third, by drawing on the experience of the SMP, the consequences of which may cast some light on the longer-term effects expected from EMU.

**EMU's impact on prices** **5.4** A single currency would, as outlined in Section 3, be expected in theory to reduce trade barriers, increase price transparency and boost trade and competition, thereby increasing pressure for price convergence. One approach to assessing the impact of EMU on competition is therefore to examine trends in prices. The EMU study by HM Treasury *Prices and EMU* addresses this issue in detail.

**5.5** The study finds some indications of price convergence in EMU. Among the large countries that entered EMU in 1999, France and Germany have seen a fall in their relative price levels<sup>1</sup> (RPLs) towards the EU average. Italy's RPL has remained below the EU average since the introduction of the euro and shown no upward movement during this time. Since 1997, the level of price convergence in the euro area has increased relative to that of the EU as a whole. Data for the geographical core of the euro area (France, Germany, Belgium, Luxembourg and the Netherlands) show both a consistently higher level of price convergence and a more marked increase in convergence in recent years. Comparison with the EU may have been affected by movements in the nominal exchange rate between the euro and the non-euro area EU currencies.

**5.6** Table 5.1 shows production-weighted coefficients of variation for price dispersion by sector in 1995 and 2002. In all euro area sectors except communications, fuel and power, and alcohol and tobacco, price divergence in 2002 was lower than it was in 1995.

**Table 5.1: Price convergence by sector**  
Production-weighted coefficients of variation for disaggregated data

Description	EU		Euro area	
	1995	2002	1995	2002
Transport goods	13.2	11.8	10.6	7.2
Clothing and footwear	15.0	11.1	14.0	7.0
Food and non-alcoholics	12.4	7.6	10.9	7.1
Restaurants and hotels	13.8	18.8	14.2	8.0
Furnishings and equipment	13.3	10.5	13.5	8.9
Recreation and cultural services	16.9	13.3	13.6	8.9
Recreation and cultural goods	11.7	7.3	9.1	6.2
Miscellaneous goods and services	21.7	10.9	22.9	11.0
Health	22.2	13.4	19.5	11.7
Fuel and power	15.9	18.1	12.9	15.2
Alcohol and tobacco	22.8	36.9	20.6	23.1
Rent and maintenance	28.7	19.5	28.2	21.4
Communications	14.8	26.9	15.8	23.2
Transport services	23.4	27.9	25.3	24.3
Tradeable goods	11.7	8.4	11.0	5.8
Non-tradeables	19.4	12.7	19.7	11.3
All items	15.8	10.7	15.7	8.7

Source: Eurostat and HM Treasury calculations.

### Price divergence in the EU and US

**5.7** Comparison of the EU with the US using European Commission data suggests that price dispersion in the EU is higher across all categories, and particularly in health care (though US price dispersion is notable in housing and utilities). According to these data, discussed in more detail in the EMU study *Prices and EMU*, average price dispersion in the US is one fifth less than in the EU. It is difficult to know how far this reflects the US being a mature monetary union and how far it reflects other factors such as the lack of significant internal political borders, a more generally competitive trading environment and relatively low transport costs.

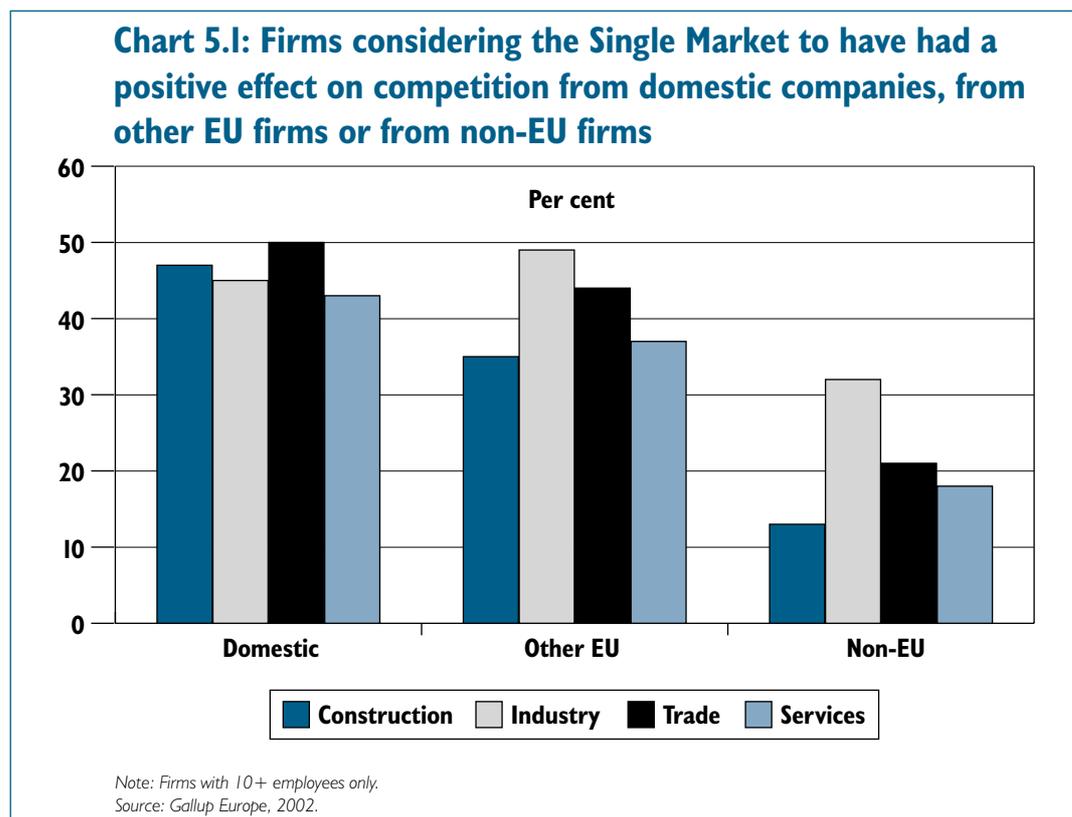
### Impact of SMP on competition

**5.8** Analysis of the impact of EMU on competition can be informed not only by current data but also by past experience; in particular, the impact of the SMP in the EU. From the perspective of promoting competition, the most important measures within the SMP included steps to institute common rules on regulation, takeovers, state assistance to

<sup>1</sup> The RPL is the ratio of domestic to foreign prices adjusted for the exchange rate between domestic and foreign currency. A full definition is included in the EMU study by HM Treasury *Prices and EMU*.

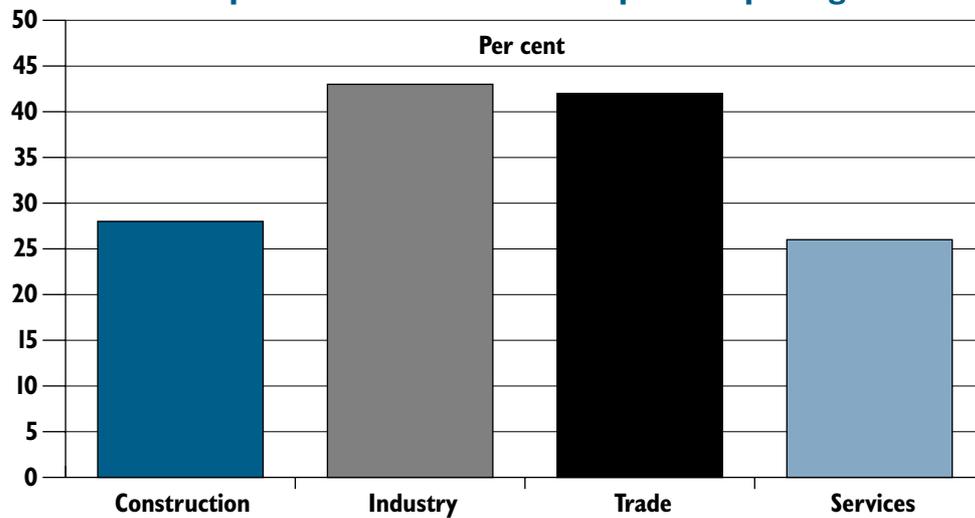
industry, patents and copyrights, company accounting and disclosure of information; the opening of public procurement to competitive tender; and reduced intervention in agriculture. Such a broad range of measures inevitably affected different sectors in very different ways. Chart 5.1 describes EU business perceptions of the extent to which the SMP has boosted competition. Overall some 48 per cent of companies considered that the SMP had increased competition from domestic firms; 42 per cent considered that the SMP had increased competition from firms elsewhere in the EU; and 22 per cent considered that the SMP had increased competition from non-EU firms. The SMP's impact on competition appears to have been more widespread than its impact on, for example, exports. The same survey found 25 per cent of firms reporting that the SMP had helped boost sales to other Member States and 17 per cent reporting that the SMP had helped boost sales to non-EU countries.

**5.9** UK firms had the lowest positive responses with respect to the SMP's impact on domestic competition and on competition from other EU firms, and the second lowest positive response regarding non-EU competition. This may be a function of the UK having already been relatively open and competitive at the time of the SMP's launch and the effect of the SMP therefore being perceived as having been less dramatic in the UK than in some other EU countries.



**5.10** Service sector companies in all EU countries tend to report less of a boost to competitive pressure from the SMP than their trade or industry sector counterparts. This is consistent with the services sector finding the SMP less influential than other sectors on pricing strategies (see Chart 5.2). Here again, UK companies appear to have been less affected by the SMP than companies in other Member States, with only 29 per cent of UK companies considering it to have been an important influence on product pricing (compared with 36 per cent of EU companies overall).

**Chart 5.2: Companies considering the Single Market to have been an important influence on their product pricing**



Note: Firms with 10+ employees only.  
Source: Gallup Europe, 2002.

### SMP gains from scale and competition

**5.11** The SMP was intended to bring substantial gains through increased efficiency, with lower costs and prices and increased product variety. This was forecast to occur via two main channels: the exploitation of scale economies, and increased competition prompting the elimination of inefficient firms and industry restructuring. Allen *et al.* (1998) estimate that the reduced price-cost margins brought about by the SMP raised UK GDP by 1.1 per cent (though this assumes integrated product markets in the EU). European Commission DG Economic and Financial Affairs (1996a) analysis suggests that the cost reductions achieved over the period 1985-1993, during which time the SMP was being implemented, were primarily a result of the exploitation of scale advantages linked to fixed investment in marketing, brand development, R&D and the development of new products and production processes.

**5.12** Focusing on the effect of the SMP on the UK, Griffith (2001) used panel data of manufacturing establishments in 1980-1996 to investigate the relationship between product market competition and productivity levels and growth. Following the approach of the Cecchini report, Griffith divided industries into three categories: those where non-tariff barriers to trade were already low pre-SMP; those with intermediate levels of non-tariff barriers which might be susceptible to measures undertaken as part of the SMP; and those with high non-tariff barriers which, again, might be reduced by SMP measures. The first category was assumed to be relatively insensitive to the SMP; in the second and third categories, however, there was the potential for a significant reduction in non-tariff barriers. *Ex ante*, industries in these latter two categories (described in Table 5.2) could be expected to be 'sensitive' to the SMP; an expectation which Griffith found to be borne out in the empirical evidence. She found increased efficiency and growth in 'SMP-sensitive' sectors but not in sectors where barriers had been low to begin with (or where non-tariff barriers would not have been expected to be affected by SMP measures). Mark-ups fell by more in the *ex ante* 'SMP-sensitive' sectors than in the 'non-sensitive' sectors.

**Table 5.2: Industries affected by the Single Market Programme**

High non-tariff barriers	Moderate non-tariff barriers
Specialised chemicals	Glass
Pharmaceutical products	Refractory and ceramics
Mining and construction	Basic industrial chemicals
Power transmission equipment	Agricultural machinery
Other machinery	Metal-worked machinery
Manufacture of office equipment	Textile machinery
Insulated wires	Processing machinery
Basic electrical equipment	Machinery for wood
Telecomms equipment	Domestic electrical appliances
Other electronic equipment	Electric lamps
Shipbuilding	Motor vehicles and parts
Railway and tramway	Brewing and malting
Precision instruments	Soft drinks
Medical equipment	Woollens
Optical instruments	Cotton and silk
Ice cream, chocolate	Carpets
Jewellery	Footwear
Toys and games	Clothing
	Household textiles
	Rubber

Source: Griffith, 2001.

## TRENDS IN SPECIALISATION

**5.13** Specialisation describes the extent to which the activity of a given region occurs in a small number of industries. EMU entry might, as Section 3 described, encourage specialisation, thereby facilitating the exploitation of comparative advantage and economies of scale. Increased specialisation may also carry costs. Not only the one-off adjustment costs related to restructuring, but also increased vulnerability to asymmetric shocks (Krugman 1993). The EMU study *Analysis of European and UK business cycles and shocks* by Professor Michael Artis looks at whether there is a 'UK idiosyncrasy' in terms of the incidence of shocks in the UK relative to other EU countries, and at whether EMU itself will prompt greater synchronicity of shocks.

**5.14** Similar industrial structures do not mean that countries will react to similar shocks in similar ways. If, for example, UK products in a particular sector are less sophisticated than German products, UK exports are likely to be sold in markets where price is a more important factor. Carlin *et al.* (2001) found that UK and Swedish exports tend to be more price sensitive than German or French across all sectors (see Section 6). UK export performance is discussed further in Professor Wendy Carlin and Dr Andrew Glyn's contribution to the EMU study *Submissions on EMU from leading academics*.

**5.15** As specialisation is a gradual, long-term process, it is not yet possible to examine the extent to which it has been influenced by EMU. Instead, this section assesses the probable impact of the single currency on specialisation by taking into account evidence on:

- trends in EU specialisation;
- specialisation in currency unions;

- specialisation in the EU compared with the US; and
- specialisation in the UK compared with the EU.

**Alternative sources of evidence** **5.16** Much of the evidence on specialisation involves comparison of US and EU industrial structures. Comparability is complicated by the reliability and availability of the data, and by the fact that specialisation can be based on different aggregates. It may be estimated on the basis of output or value added, trade, or employment. The specialisation indices constructed from these alternative sources do not always tell mutually consistent stories.

**5.17** Despite these difficulties, some common themes can be identified. EU specialisation appears to have increased over recent years, but only to a limited extent. As Hallet (2000) notes, this may be partly because problems of data availability constrain studies to periods too short to observe changes in trend.

### Trends in EU specialisation

**Specialisation patterns based on output data** **5.18** Midelfart-Knarvik *et al.* (2000) is one of the most comprehensive recent surveys of industrial specialisation in the EU. Their results, reproduced in Table 5.3, indicate that during the 1970s – a period of large exchange rate fluctuations, and of increased tariff and non-tariff barriers following the collapse of the Bretton Woods system – the industrial structures of most EU countries became more convergent due to a common decline in the share of the manufacturing sector noted in Section 2. In the 1980s, as European integration increased in the run-up to the launch of the SMP, manufacturing specialisation began to increase. Midelfart-Knarvik *et al.* (2000) attribute most of the growing divergence of EU structures in the 1980s to changes in the industry mix at a national level. The UK and France were the least specialised countries in the early 1970s, and this remained the case over the following twenty years.

**Table 5.3: Specialisation in EU manufacturing<sup>1</sup>**

Krugman specialisation index	1970-73	1980-83	1988-91	1994-97
Austria	0.31	0.28	0.28	0.35
Belgium	0.33	0.35	0.38	0.45
Denmark	0.56	0.55	0.58	0.59
Finland	0.60	0.51	0.53	0.59
France	0.20	0.19	0.21	0.20
Germany	0.33	0.31	0.35	0.37
Greece	0.53	0.58	0.66	0.70
Italy	0.35	0.35	0.36	0.44
Ireland	0.70	0.62	0.66	0.78
Netherlands	0.51	0.57	0.55	0.52
Portugal	0.54	0.48	0.59	0.57
Spain	0.44	0.29	0.33	0.34
Sweden	0.42	0.39	0.40	0.50
UK	0.23	0.19	0.22	0.21
<b>EU average<sup>2</sup></b>	<b>0.33</b>	<b>0.30</b>	<b>0.33</b>	<b>0.35</b>

<sup>1</sup> Krugman specialisation indices, relative to the rest of the EU and based on gross output data (four year averages). The index can range from zero, implying the country has an identical structure to the rest of the EU, to a maximum value of two, implying that it has no industries in common with the rest of the EU (see Annex B for further detail).

<sup>2</sup> Weighted average.

Source: Midelfart-Knarvik *et al.*, 2000.

**5.19** Table 5.3 suggests that EU entry promotes specialisation. While the picture for first wave EU entrants<sup>2</sup> is somewhat mixed, specialisation increased for those countries which joined in the 1970s and 1980s, in part as the rigours of the Single Market shaped their economies. For the entrants of the 1990s, specialisation rose in the latter part of the decade. These results are consistent with the expectation of economic theory, outlined in Section 3, that lower trade barriers lead to more specialisation.

**Specialisation patterns based on trade data**

**5.20** Trade data, for practical reasons of reliability and availability, are often used to measure trends in specialisation. Disaggregated trade data allow a distinction between intra and inter-industry trade. As Table 5.4 shows, in 1996 most trade within the EU was intra-industry. The import and export of goods belonging to the same industry sector accounted for almost 60 per cent of intra-EU trade, compared to just over half in the early 1980s. Almost three-quarters of EU trade with non-EU countries was, in contrast, inter-industry; between, rather than within, industries. Inter-industry trade might suggest a greater degree of specialisation, in that countries are producing and exchanging dissimilar products. But it is difficult at this level of aggregation to determine what a high and rising level of intra-industry trade implies for specialisation. Intra-industry trade could reflect trade in similar finished products (horizontal trade), or trade at different stages of production (vertical trade). If the latter, then an increasing proportion of intra-industry trade might be consistent with increasing, not declining, specialisation.

**Table 5.4: Inter and intra-industry EU trade, 1996**

Per cent	Inter-industry	Intra-industry
World	52.7	47.3
Intra-EU	40.9	59.1
Extra-EU	73.4	26.6

*Source: Fouquin et al., 2001.*

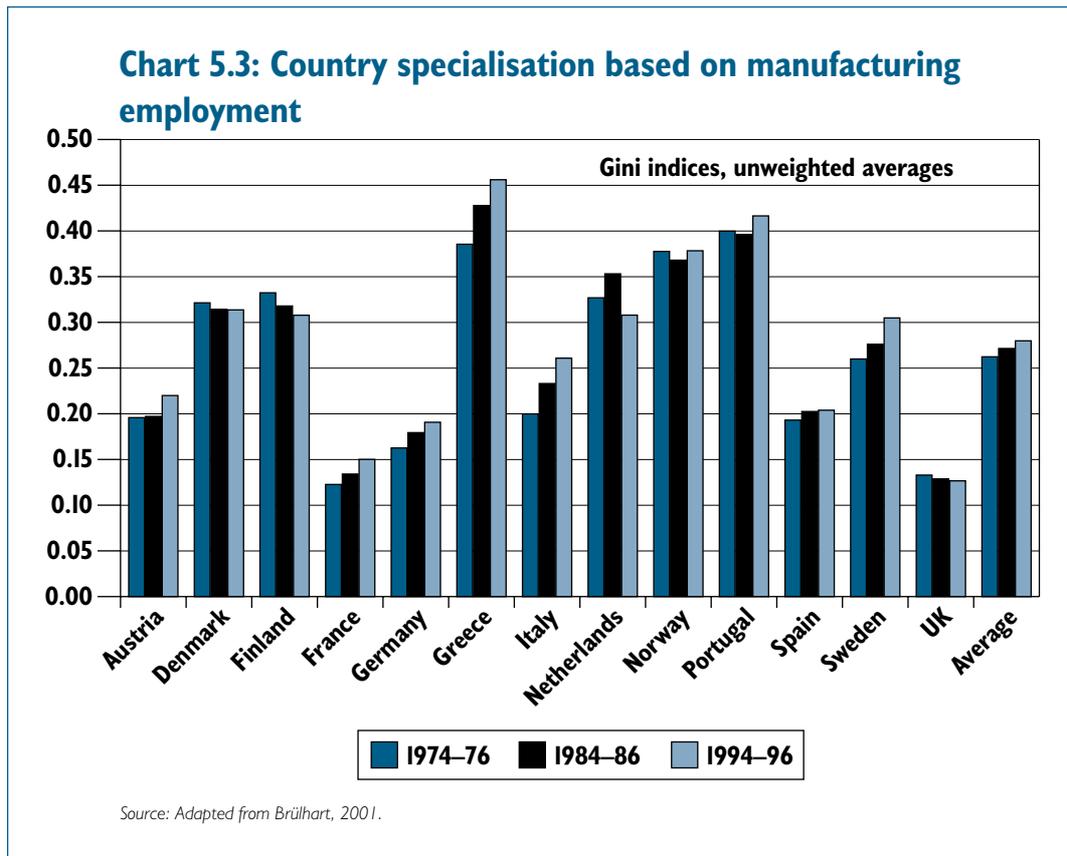
**5.21** Brülhart (2001) computes locational Gini indices (see Annex B for detailed definitions) based on global manufacturing exports for 14 European countries from 1972-1996. He finds that measured in terms of exports, specialisation has declined. Larger countries (the UK, France and Germany) are less specialised than their smaller counterparts (Greece, Portugal and Norway).

**Specialisation patterns based on employment data**

**5.22** Brülhart (2001) also addresses manufacturing specialisation patterns based on employment and finds that larger economies are less specialised and smaller countries more specialised (using data for 1972-1996). Specialisation levels on this basis are considerably lower than those computed from export data. The overall average Gini coefficient of employment was 0.27 compared to 0.39 for exports. Brülhart attributes the discrepancy to the presence of non-traded goods in highly aggregated employment data. As Chart 5.3 shows, the long-term specialisation trend in employment is upwards, with a decline in specialisation evident in only a small number of countries, including the UK.

<sup>2</sup> Entry into the EU occurred in a number of waves:

- Belgium, France, Germany, Italy, Luxembourg, Netherlands (1957);
- Denmark, Ireland, UK (1973);
- Greece (1981), Portugal, Spain (1986); and
- Austria, Finland, Sweden (1995).



### Bringing the EU data together

**5.23** Specialisation estimates based on trade, output and employment data seem to tell different stories. Some studies of export data suggest declining specialisation in the EU; output and employment measures point to an increase. Countries appear to have become more specialised in manufacturing output and employment, but to have seen a diversification of manufacturing exports.

**5.24** This apparent contradiction could reflect two factors. First, many studies focus only on manufacturing, which may not be representative of the overall economy. While manufacturing specialisation appears to have increased in the EU during the 1980s and 1990s, Hallett (2000), for example, suggests that the structural shift from manufacturing to services has led to greater similarity in overall specialisation indices. Even where studies focus solely on manufacturing, the extent to which traded and non-traded goods sectors feature in the datasets used may produce inconsistent results.

**5.25** Brülhart (2001) suggests a second explanation related to the differing speeds of two processes triggered by falling trade barriers and falling transaction costs:

- rising export propensities; and
- sector specialisation in employment.

**5.26** If the first process occurs more rapidly than the second, contradictory messages may be sent out regarding specialisation trends from trade and employment. The latter may be a more reliable indicator of the long-term trend; in which case Europe appears to be specialising, but at a very slow pace and with numerous country and sector exceptions. Not every industry enjoys scale economies, especially in the service sector. Where they do exist, they may diminish as the scale of operation increases, or even give way to diseconomies of scale. Where they are sustained, they may at some stage be interrupted by the competition authorities. A Europe specialising into an array of national champions does not appear likely.

However, a less extreme scenario of a more modest increase in specialisation, facilitated by the euro, is consistent with EU experience since the establishment of the Single Market.

### Specialisation evidence from existing currency unions

**5.27** Lessons on the possible impact of EMU on specialisation may be taken from the experience of other countries sharing a common currency.<sup>3</sup> Based on trade data, Engel and Rose (2000) calculate national measures of specialisation using a Herfindahl index (see Annex B for detailed definitions), and consider whether common currency areas are more specialised. Their database contains over 3000 observations, of which about 13 per cent relate to countries which are members of currency unions.

**5.28** Their findings show that currency union members are systematically more specialised, indicated by a higher Herfindahl index (Table 5.5). These conclusions are insensitive to controlling for real GDP per capita, and to measures of country size, and supplement work showing that countries sharing a common currency are more open to trade.

**Table 5.5: Specialisation in currency unions**

	Observations	Herfindahl Index		Number of exports	
		Mean	St. dev.	Mean	St. dev.
Non-currency union members	2,657	0.23	0.24	254	132
Currency union members	388	0.31	0.19	132	89

Source: Engel and Rose, 2000.

### Comparing EU and US levels of specialisation

**5.29** Another indication of the implications of EMU for specialisation may come from the US (discussed in more detail in the EMU study by HM Treasury *The US as a monetary union*). Krugman and Venables (1996) argue, on the basis of broad employment shares, that the US is more specialised than the EU. Table 5.6 shows that in steel, cars and textiles, employment is more evenly distributed across the four large EU countries, than it is across four US regions. The single currency and the Single Market might, therefore, be expected to draw the euro area in a more specialised direction. This is not necessarily the case, because initial starting points themselves influence destinations. Patterns of output, employment and trade may, once established, be extremely robust to change; a euro area subject to US-style competitive pressures will not necessarily converge to a US-style structure.

**Table 5.6: Employment shares in the US and EU**

	Steel	Cars	Textiles
<b>US (1990)</b>			
North East	13.4	7.9	14.2
Mid-West	51.8	65.6	3.2
South	24.5	23.4	79.6
West	10.4	7.0	3.9
<b>EU (1989)</b>			
France	18.9	25.3	15.8
Germany	20.2	34.7	13.2
Italy	18.7	9.5	17.4
UK	15.8	13.0	18.6

Source: Krugman and Venables, 1996.

<sup>3</sup> This is defined as countries sharing the same currency and is not as tightly defined as a single currency.

**5.30** In line with the Krugman and Venables (1996) work on employment, most studies based on production data point to the EU being considerably less specialised than the US, though agreement is by no means universal. Clark and van Wincoop (1999), for example, draw on data from ten broad sectors<sup>4</sup> to conclude that US regions are, on most measures, less specialised than the EU. They also note that while EU and US specialisation indices were at a similar level in the mid-1970s, the US index fell during the 1980s while the EU index remained relatively constant. One explanation of these different results might relate to the level of industrial aggregation used. The US seems to be more specialised at a high level of industrial disaggregation while at more aggregate levels it is less specialised than the EU. For further discussion, see the EMU study by HM Treasury *The US as a monetary union*.

#### Changes in US specialisation

**5.31** Midelfart-Knarvik *et al.* (2000), while corroborating the finding of greater specialisation in the US, discern a steady decline in US specialisation as measured in relative terms by the Gini coefficient (see Table C14 in Annex C). This decline contrasts with the dip and then revival in EU manufacturing specialisation (as shown in Table 5.3).

### Comparing UK and EU levels of specialisation

**5.32** How different, or similar, are the UK and EU industrial structures, and does the development of the latter give any guide to the direction of change in the former, were the UK to join EMU?

#### Relatively low UK specialisation

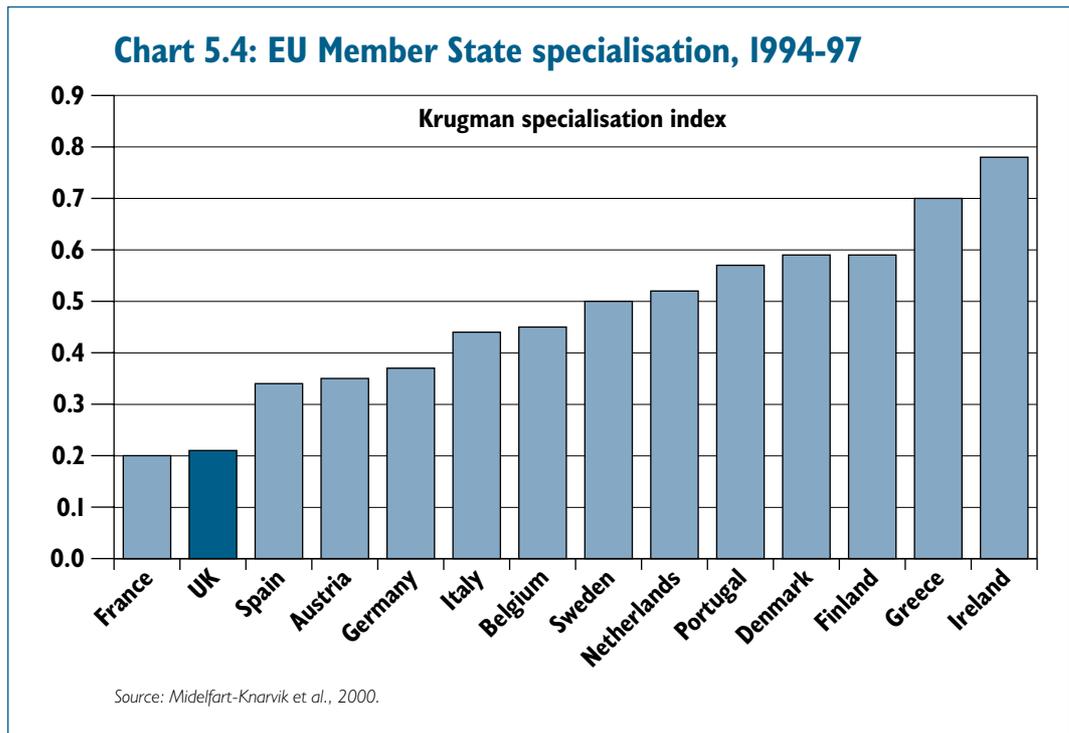
**5.33** As discussed above, most studies find the EU industrial structure to be less specialised than the US. The same studies also tend to find that the UK is less specialised than most of its EU counterparts (see Chart 5.4, which presents the 1994-97 data from Table 5.3), though comparable to France (with both countries experiencing a slight decline in specialisation between the early and late 1990s).<sup>5</sup>

**5.34** Brülhart (2001), as noted earlier (Chart 5.3), also identified declining UK specialisation in the 1980s and 1990s. There was no indication that this reflected simply long-term convergence, i.e. reversion towards a long-term average. The UK, with declining specialisation, was characterised by a very low level of specialisation; highly specialised Greece, meanwhile, saw further sharp increases.

**5.35** The UK's relatively low specialisation is in part a function of its size. Smaller countries will tend to be more specialised than large countries, especially within manufacturing, for the reason that some industries may not exist in smaller countries (the gap being filled by imports). In this context, the greater degree of specialisation of Germany and Italy, and the increase in specialisation in these countries over time, is significant.

<sup>4</sup> Agriculture, forestry and fishing; mining; construction; manufacturing of durable goods; manufacture of non-durable goods; transport, storage and communications; utilities; wholesales and retail trade, and restaurants and hotels; finance, insurance, real estate, business services; and community, personal and other services.

<sup>5</sup> Comparisons are based on two-digit industry-level data. However, gains from clustering frequently arise at the level of three to four digit industries or below (Henriksen *et al.*, 2001). Hence these figures are only one guide to the actual levels of specialisation in each country. They also do not take account of specialisation in the service sector.



**EU and UK manufacturing specialisation** 5.36 Table 5.7 shows the three manufacturing sectors each Member State is most specialised in (in terms of value added at factor cost). Relative specialisation, as here, does not necessarily indicate that an industry makes a large contribution to national value added. A country may be specialised in a relatively small sector, though Table 5.7 is filtered to include only industries accounting for at least 0.5 per cent of manufacturing value added. On this basis, France, Germany, Ireland, the Netherlands, Finland, Sweden and the UK are all specialised in at least one technology-driven sector, while the southern Member States tend to specialise in labour-intensive sectors.

**Table 5.7: Manufacturing specialisation by Member State, 1999**

Austria	Railway rolling stock	Sawmilling, planing of wood	Sports goods
Belgium	Made-up textile articles	Other first processing of iron, steel	Other textiles
Denmark <sup>1</sup>	Ship building and repair	Fish	Games and toys
Finland	Pulp, paper and paperboard	Sawmilling, planing of wood	Telecommunications equipment
France	Aircraft and spacecraft	Processing of nuclear fuel	Steam generators
Germany	Electricity distribution and control apparatus	Machine tools	Motor vehicles
Greece <sup>1</sup>	Cement, lime and plaster	Textile fibres	Fruit and vegetables
Ireland	Electronic components	Medical and surgical equipment	Office machinery and computers
Italy <sup>1</sup>	Ceramic tiles and flags	Motorcycles and bicycles	Tanning and dressing of leather
Luxembourg <sup>2</sup>	Basic iron and steel	Other textiles	Rubber products
Netherlands <sup>1</sup>	Audio-visual household goods	Prepared animal feeds	Oils and fats
Portugal	Footwear	Knitted and crocheted fabrics	Other wood products
Spain	Ceramic tiles and flags	Stone	Oils and fats
Sweden	Pulp, paper and paperboard	Sawmilling, planing of wood	Telecommunications equipment
UK <sup>2</sup>	Aircraft and spacecraft	Office machinery and computers	Refined petroleum products

<sup>1</sup> 1998

<sup>2</sup> 1997

Source: European Commission, Eurostat, 2002.

**Bilateral comparisons** **5.37** Industry shares in a country's activity can be compared not only with the corresponding shares for the rest of the EU as a whole, but also with the shares for other individual countries. This second comparison produces a matrix of bilateral differences between the industrial structures of pairs of countries. Midelfart-Knarvik *et al.* (2000) explored both approaches. The results of the first – specialisation relative to the rest of the EU – were shown in Table 5.3 and Chart 5.4. Table 5.8 shows bilateral comparisons, illustrating the six countries which most closely resemble the UK during the period under consideration. The lower the number, the greater the similarity of the industrial structure of two countries. The final two rows indicate the EU countries with which the six featured countries are most like and unlike, from the full range of EU countries included in the Midelfart-Knarvik *et al.* analysis.

**Table 5.8: Bilateral differences, 1994-1997**

	UK	France	Germany	Italy	Spain	Neths
UK	0					
France	0.19	0				
Germany	0.36	0.35	0			
Italy	0.47	0.51	0.49	0		
Spain	0.38	0.33	0.43	0.53	0	
Netherlands	0.46	0.46	0.61	0.77	0.58	0
<i>Most like:</i>	<i>France</i>	<i>UK</i>	<i>France</i>	<i>Austria</i>	<i>France</i>	<i>Belgium</i>
<i>Most unlike:</i>	<i>Ireland</i>	<i>Ireland</i>	<i>Greece</i>	<i>Portugal</i>	<i>Ireland</i>	<i>Italy</i>

*Source: Midelfart-Knarvik et al., 2000.*

**5.38** This analysis confirms that in 1994-1997 the UK was closest in terms of its industrial structure to France, and the second most similar country to Germany and to Italy. Comparison with 1980-1983 suggests that the differences between most pairs of countries (71 pairs out of 91) had grown more distinct over time. The UK and France, however, had become increasingly similar.<sup>6</sup>

**5.39** The industrial structure which the UK resembles least in the above analysis, is that of Ireland, its geographically closest neighbour and the one Member State with which it shares a land border. This may reflect a tradition of specialisation between the UK and Ireland, two countries with close geographical and historical associations, including a period with a common currency. It may also reflect the fact that Ireland is a relatively small country compared with the UK.

**UK and euro area comparisons** **5.40** Analysis by the Department of Trade and Industry (DTI) for this study, extends the work of Midelfart-Knarvik *et al.* (2000) to look at the specialisation of the UK relative to the euro area aggregate.<sup>7</sup> It constructs Krugman indices (see Annex B for definitions) in terms not only of gross output, but also of value-added and exports. Table 5.9 summarises the results, which show rising specialisation in terms of production and value added, but declining UK specialisation in terms of exports.

<sup>6</sup> For 1980-1983, the UK-France bilateral difference stood at 0.22. See Midelfart-Knarvik *et al.* (2000).

<sup>7</sup> Luxembourg and Ireland are excluded.

**Table 5.9: Krugman specialisation indices<sup>1</sup> relative to the euro area plus the UK**

	Production		Value added		Exports	
	1984-87	1991-94	1984-87	1991-94	1984-87	1991-94
Austria	0.22	0.26	0.23	0.25	0.47	0.40
Belgium	0.26	0.29	0.29	0.26	0.38	0.42
Finland	0.44	0.46	0.44	0.44	0.83	0.82
France	0.10	0.11	0.12	0.13	0.21	0.23
Germany	0.29	0.31	0.31	0.34	0.39	0.35
Greece	0.55	0.59	0.57	0.57	1.10	1.09
Italy	0.30	0.35	0.38	0.38	0.50	0.52
Netherlands	0.46	0.43	0.37	0.35	0.65	0.56
Portugal	0.51	0.58	0.54	0.68	0.83	0.86
Spain	0.26	0.28	0.31	0.36	0.40	0.40
UK	0.14	0.16	0.20	0.26	0.34	0.32

<sup>1</sup> The Krugman specialisation index is zero if the two regions have the same structure, and is two if they have no industries in common (see Annex B for further detail).

Note: Ireland and Luxembourg are excluded.

Source: DTI.

**5.41** Using a different data set and revised classifications<sup>8</sup> (see Table 5.10), the DTI work finds that France is the economy most similar to the overall of the four largest EU economies (EU4) in aggregate, followed by the UK and Germany, with Italy the outlier. Extrapolating the results from the old STAN database to this table implies declining relative specialisation in France, the UK and Italy, but an increase in Germany. The UK, in other words, appears more similar in terms of its degree of specialisation to that of the euro area as a whole, than does Germany.

**Table 5.10: Krugman specialisation indices<sup>1</sup> relative to the four major EU economies, whole economy**

	Production		Value added		Exports	
	1992-95	1996-98	1992-95	1996-98	1992-95	1996-98
France	0.19	0.18	0.18	0.18	0.32	0.31
Germany	0.20	0.21	0.23	0.22	0.36	0.36
Italy	0.25	0.26	0.25	0.24	0.56	0.60
UK	0.21	0.22	0.18	0.19	0.40	0.40

<sup>1</sup> The Krugman specialisation index is zero if the two regions have the same structure, and is two if they have no industries in common (see Annex B for further detail).

Source: DTI.

<sup>8</sup> The DTI used the OECD's new STAN database which uses revised industrial classifications and covers the whole economy. As data were available only for the G7 countries, specialisation could be measured relative only to the major EU economies rather than to the EU or euro area as a whole. Furthermore, given both the new industrial classification and German reunification, full sector breakdowns were available only from 1992.

**UK interest rate and cost sensitivity** **5.42** The DTI work also asks whether the UK is more or less specialised than its major EU neighbours in sectors which are either particularly interest rate-sensitive, or in which exports are sensitive to relative costs and hence to the exchange rate (characteristics which will determine the openness of firms and the exposure of firms to the economic cycle, and which are discussed further in Section 6). Germany appears to have by far the biggest exposure to interest rate sensitive sectors; a reflection, perhaps, of its capital goods orientation. Italy has the highest exposure to cost-sensitive sectors, which may be a function of its large textiles and clothing industries. The UK, in terms of production and value-added is close to the EU4 average. In terms of export composition, it appears to be less interest rate sensitive than its large EU counterparts, though more cost sensitive than either France or Germany (data are included in Tables C15 and C16 in Annex C).

**Implications for the UK of differences in specialisation** **5.43** This analysis suggests that the UK is less specialised than most euro area countries, and that the EU is less specialised than the mature US currency union. The UK's lower level of specialisation may reflect its larger services sector, though the difference with many other EU countries is marked also within manufacturing. Lower UK specialisation could suggest scope for greater potential gains in terms of productivity from more cross-border trade and investment within EMU, with increased specialisation associated with a reallocation of resources in line with comparative advantage and economies of scale.

**5.44** As noted above, and set out in the EMU study *Analysis of European and UK business cycles and shocks* by Professor Michael Artis, there is an argument that monetary union, by leading to greater specialisation, could increase the likelihood of asymmetric shocks (see also Krugman, 1993). An alternative view put forward in, for example, Barry Eichengreen's contribution to the EMU study *Submissions on EMU from leading academics*, is that increased intra-industry trade in a monetary union could lead to asymmetric shocks becoming less likely. Eichengreen suggests that there has been little significant change in either direction as a result of the ongoing integration of the European economy (see also Bayoumi and Eichengreen, 1999). On balance, the relatively low level of specialisation in the EU, and in particular in the UK, compared with the US, suggests that the vulnerability to asymmetric shocks stemming from industry structure is limited.

## TRENDS IN EU CONCENTRATION

**5.45** Specialisation describes the extent to which the activities of a country or region are in a small number of industries or sectors. There are two forms of concentration:

- industry concentration describes the extent to which activity in a given industry or sector takes place in a small number of firms (Section 6 includes a discussion of the potential impact of EMU on ownership patterns and firm size); and
- geographical concentration – the focus of the analysis in this section – describes the extent to which activity in a given industry or sector takes place in a small number of countries or regions, rather than being more dispersed.

**5.46** Levels of industrial and geographical concentration do not always correspond; agglomeration can be thought of as the extent to which geographical concentration exceeds what the ‘normal’ industry concentration would imply. As with specialisation, patterns of concentration may be affected by EMU-related changes in the competitive climate, and many of the themes outlined above feature again here. One of the consequences of increased concentration could be that higher value-added firms and sectors locate together, leading to higher wages in these ‘core’ regions and increased income disparity overall. This section looks at whether ‘core’ areas are attracting higher value added and higher wage industries at the expense of poorer ‘periphery’ areas, using evidence on income trends across the EU. It then reviews developments in concentration within Member States and, finally, reviews the argument that the expansion of the service sector is halting the trend towards concentration.

### Core versus periphery

**5.47** One concern highlighted in the theoretical discussion of Section 3 was whether EMU might promote the location of higher value-added activity in ‘core’ countries. Identifying what constitutes the ‘core’ and what the ‘periphery’ is far from straightforward and often politically sensitive. These are also terms which can cover different issues. In the EMU study *Analysis of European and UK business cycles and shocks* by Professor Michael Artis they are used to discuss the idea of a ‘core’ of countries centered around Germany, which share similar economic cycles and shocks, with other countries forming the periphery.

**5.48** In terms of economic geography, a peripheral region is essentially defined as one with low accessibility, but other criteria are frequently added.<sup>9</sup> New economic geography models suggest that economic integration can widen regional gaps by encouraging agglomeration and, therefore, raising labour demand in core regions, based on the assumptions of increasing returns, local externalities, low transport costs and labour immobility. The determinants of agglomeration are discussed further in the EMU study by HM Treasury *The location of financial activity and the euro*. Padoa Schioppa and Basile (2002) identify three different types of EU peripheral area:

- the cohesion countries (Greece, Spain, Portugal, Ireland);
- the northern Scandinavians (Finland, Sweden); and
- the peripheral regions of large countries (e.g. the former east Germany and southern Italy).

**5.49** They also point to two types of core area: small countries which belong fully to the core (Austria, Belgium, the Netherlands, Denmark and Luxembourg), and core regions of large countries. A hybrid group of larger countries, including both core and peripheral regions, comprises Italy, Germany, France and the UK. Some peripheral regions have, due to catch-up, become increasingly less peripheral in recent years, Ireland being an obvious example. This picture may be complicated further by the next EU enlargement of up to ten new Member States.

**5.50** The European Commission, DG Internal Market (2000) notes that between 1988 and 1998, the geographic concentration of manufacturing activities across countries declined, contradicting predictions that the internal market would increase the gap between the core and the periphery. The Commission also argues that the internal market has allowed firms to exploit economies of scale and increase productivity. This process has been “...underpinned by progressive reduction in the relative disparities across Member States in the availability of technology, capital and labour” (page 12).

<sup>9</sup>For further discussions of the difficulty of gauging peripherality, see Schürmann and Talaat (2000).

**5.51** Overall, the evidence on income convergence within the EU is encouraging (Table 5.11), with peripheral countries such as Ireland, Spain and Portugal growing relatively quickly. As the table also shows, the standard deviation of per capita income in different countries fell sharply over 1960 to 1980 and continued to fall significantly thereafter. These crude results are consistent with the general literature on convergence, which finds convergence in GDP per capita between OECD countries. Barro and Sala-i-Martin (1991) calculate that both European and US regions' GDP per capita has converged by about 2 per cent a year (over the period 1880 to 1988 for the US, and 1950 to 1985 for the EU).

**Table 5.11: Per capita income in the EU periphery and income divergence in the EU**

EU15=100	Greece	Spain	Ireland	Portugal	Italy	St. dev. of EU15 <sup>1</sup>
1960	43.6	59.1	62.6	40.1	<b>87.3</b>	29.6
1970	62.9	72.9	61.2	50.4	<b>95.6</b>	23.2
1980	70.0	72.7	<b>65.5</b>	55.4	<b>101.1</b>	20.2
1990	<b>58.3</b>	<b>76.5</b>	<b>73.3</b>	<b>61.0</b>	<b>101.9</b>	18.9
2000	<b>67.1</b>	<b>82.1</b>	<b>114.3</b>	<b>75.7</b>	<b>98.9</b>	15.1

<sup>1</sup> Standard deviation based on the current 15 Member States throughout, excluding Luxembourg.

Note: Figures in **bold** for individual countries indicate periods of EU membership. Figures use a purchasing power standard.

Source: European Commission, DG Economic and Financial Affairs, 2000.

### The experience of the US

**5.52** Brühlhart (2001) finds that the distribution of EU manufacturing employment has become more concentrated over the past three decades. This contrasts with the US experience of increasing dispersion over recent decades. Anderson and Bram (2001) note that in the early 1900s, US manufacturing was highly concentrated in a few major port cities in the North East. Gradually the migration of the population to the South and the West, the construction of transport links, technological advances, and increasing labour, land and energy costs eroded the North East's advantages. The period from the 1970s to the 1990s saw a steady dispersion of employment and a convergence of 'manufacturing density' – manufacturing jobs per square mile – as jobs shifted from states with the highest manufacturing densities, to those with the lowest. The US experience is discussed further in the EMU study by HM Treasury *The US as a monetary union*.

**5.53** Devereux *et al.* (2002) also note a contrast between UK and US experience with respect to agglomeration and new entry. In the US firm entry tends to reduce geographical concentration as new plants locate away from established industry centres (Dumais *et al.* 2002). Devereux *et al.*, however, find that new entry in the UK tends to reinforce agglomeration with entrants favouring the already congested areas. Between 1985-1991, for example, 67 per cent of UK entrants to the highly agglomerated lace sector chose to locate in the most crowded postcode area in Nottingham (see Table C17 in Annex C for further detail).

## Concentration effects within Member States

**5.54** Evidence for regional convergence within, rather than between, EU Member States is mixed:

- Dignan (1995) estimates that, within the euro area and over the 1984-1990 period, GDP per capita converged steadily between countries but diverged within them (though this appears to have shifted more recently to slow convergence);

- the European Commission, DG Regional Policy (1996, 2001, 2003) find convergence between countries in GDP per capita levels over the decade 1990-2000, largely due to catch-up by the cohesion countries (Spain, Portugal, Greece and Ireland). Regional income disparities, however, rose in all countries except Germany, France and Austria; and
- Braunerhjelm *et al.* (2000) bring the US into the analytical framework. They examine US data for 1960-1995 and EU data for 1977-1995, finding qualitatively similar results in each case. In the US, economic growth was higher in countries that were poor relative to the US as a whole but rich relative to the states in which they were located; in the EU, growth was higher in regions that were poor relative to the EU as whole but rich relative to their own Member States. Convergence at an EU or US level, therefore, appeared to have occurred alongside local polarisation.

**5.55** Brühlhart and Traeger (2002) examine the impact of EU entry on sectoral concentration. They find that EU accession significantly increases within-country concentration in three sectors: manufacturing, market services and non-market services. Agriculture and construction, however, do not appear to be affected. As to whether EU accession changes the centre-periphery profile of location, Brühlhart and Traeger conclude that this is the case for two sectors, manufacturing and market services, but in opposite directions. Accession appears to encourage manufacturing industry to locate in the periphery, but market services to locate in central regions.

## Explaining trends in concentration

**5.56** Midelfart-Knarvik *et al.* (2000) find that the EU has, since the 1970s, experienced a light but erratic decline in manufacturing concentration. Brühlhart (2001) finds, as noted above, increased concentration of manufacturing employment over the same period. The contrast illustrates the difficulties inherent in identifying a clear trend in EU manufacturing concentration. Midelfart-Knarvik *et al.* suggest that relatively high tech, highly skilled and fast growing industries have tended to become more dispersed, while the less skilled labour intensive and slower growing industries have become more geographically concentrated.

**5.57** At this level of the overall economy, the relative shift from manufacturing to services tends to dampen geographical concentration measures. Services in general tend to be more dispersed than manufacturing. Midelfart-Knarvik *et al.* (2000) note the wide and increasing variation in the share of the service sector in employment across the EU, and focus on five broad sectors,<sup>10</sup> all of which are less concentrated than manufacturing. Of these five, 'financial services, insurance, real estate and business services' is the most concentrated, reflecting the high degree of clustering in financial centres such as London (although the degree of concentration has declined over time). Not surprisingly, transport services are the least concentrated.

<sup>10</sup> These are 1) financial, insurance, real estate and business services; 2) wholesaling and retailing; 3) restaurants and hotels; 4) transport; and 5) communications. For Ireland and Greece data are only available for financial, insurance, real estate and business services.

**5.58** The dampening influence of the growth of the service sector on geographical concentration is furthered by several factors, including:

- catch-up on the part of poorer Member States with initially smaller service sectors, and in which converging income levels imply strong demand for services;
- out-sourcing by manufacturers, facilitated by technological change. Many manufacturing sectors have become more intensive users of services, and manufacturing industries with high service inputs have tended to be among those growing most quickly. Technological change means that some services no longer need to be near to the production base, and allows ‘front’ and ‘back’ office activity to be undertaken in often very different locations; and
- increasing trade, especially in the ‘financial services, insurance, real estate and business services’ sector, where a decline in concentration has reflected in particular a reduction in Germany’s share, with the UK and Italy maintaining dominant positions.

**Implications of concentration for the UK**

**5.59** The possible impact of EMU entry on geographical concentration in the UK is therefore ambiguous. Greater competition and broader access to funding in EMU might encourage geographical concentration within the euro area by giving firms a greater incentive to locate in areas which were cost-competitive or offered indirect benefits such as supplier networks, reputation, proximity to research centres or supportive institutional and cultural frameworks. The UK, as its large FDI stock demonstrates, enjoys considerable advantages as an industry location. While the consequences of EMU entry for geographical concentration are uncertain, what is clear is that the importance of offering a flexible, supportive business environment would only increase.

## CONCLUSIONS ON LONGER-TERM EFFECTS

**5.60** This section examines evidence from the SMP, past periods of EU integration, more recent EU developments, as well as US experience, in order to draw conclusions about the potential long-term impacts of EMU membership. The evidence from these sources suggests that EMU, by furthering the implementation of the Single Market, will promote greater competition. Greater competition may also be a driver of a reallocation of resources leading to greater specialisation, through not necessarily greater geographical concentration. How these long-term trends, as well as the short to medium-term effects discussed in Section 4, affect different sectors with different characteristics, is the subject of Section 6.

The consequences of the EMU membership decision for UK businesses, both in the short and medium term (in terms of trade, investment and adjustment costs) and in the longer term (in terms of competition, specialisation and concentration) will be felt in different ways and to different degrees by different industries.

Evidence-based analysis, being rooted in the (primarily pre-EMU) past, has its limitations as a guide to the potential impact of EMU membership for UK industry. Its application in the context of a range of different sector characteristics can, however, help to inform a more forward-looking judgement. The most important of these characteristics include: openness and exchange rate sensitivity, pricing behaviour, market structure, firm size, financing and ownership, and cyclical. Taking each in turn, the EMU decision would have a more direct impact on UK sectors in which:

- export or import ratios are high, firms trade or compete primarily with euro area countries or historically low trade or cross-border investment ratios reflect a particular sensitivity to exchange rate barriers;
- firms have little scope to choose the pricing currency or dictate prices, or there is potential for price convergence across markets and along the supply chain;
- competitive pressure is weak, merger and acquisition potential is high, consumers are willing and able to arbitrage or sunk costs are similar for all new entrants, rather than determined in part by firms;
- small firms play an important role or multinationals could play a larger role;
- firms are accustomed to raising finance nationally, operate in new or specialised fields, have the capacity to absorb FDI or have separate managerial control and ownership; or
- product demand is highly cyclical or cyclical is highly damaging.

**6.1** To what extent might EMU membership help, hinder or reshape the UK's industrial performance? Section 3 identified the three main potential short to medium-term forces associated with EMU membership: reduced barriers to trade, increased investment and adjustment costs. It also noted the euro's potential to promote and shape competition, specialisation and concentration. The evidence for such developments in the euro area to date was examined in Sections 4 and 5.

**6.2** EMU will have consequences for UK business, irrespective of whether or not the UK decides to join:

- for the UK outside EMU, increased competition within the euro area and greater cross-border trade and investment imply both new challenges and new opportunities for UK firms which sell to euro customers, buy from euro area suppliers or compete with euro area firms; and
- were the UK to join EMU, the challenge and the adjustment costs would be qualitatively and quantitatively different; so too would be the opportunities and the benefits, both for UK firms and UK consumers.

**6.3** In either case, UK industry needs to be sufficiently flexible to adapt to a new environment. What this entails in practice will vary between different firms and different sectors.

**6.4** This section examines at how the potential impact of EMU may vary between industries according to the key characteristics identified earlier in the study:

- openness and exchange rate sensitivity;
- pricing behaviour;
- market structure;
- firm size;
- financing and ownership; and
- cyclicalities.

**6.5** The section draws together the threads from those which precede it to explore the relevance of these characteristics, illustrating each with a variety of industry examples in order to give a more forward-looking focus to the analysis.

### Openness and exchange rate sensitivity

**6.6** EMU membership might be expected to have its greatest impact on sectors characterised by trade openness and exchange rate sensitivity. Both describe an industry's exposure to non-domestic activity, though the two do not always go together. A highly traded sector may, for example, be relatively unaffected by exchange rate fluctuations if demand for its product is relatively insensitive to price changes or if it is protected by regulation or procurement practices. The removal of intra-euro area exchange rate volatility will have a more immediate direct impact on sectors which:

- derive a high proportion of their turnover from export markets or import a high proportion of their inputs;
- trade or compete primarily with other euro area countries; and/or
- have historically had low trade or cross-border investment ratios reflecting a particular sensitivity to exchange rate barriers.

**6.7** UK firms in relatively open sectors and which trade or compete primarily in euro area markets would derive immediate benefit from the reduction in transaction costs and elimination of intra-euro area exchange rate volatility accompanying EMU entry (Box 6.1 provides examples of such sectors). Were the UK not to join EMU, and if the retention of exchange rate volatility and transaction costs proved a relative disadvantage for UK firms in euro area markets, firms in these sectors would be among the most exposed. For UK companies competing primarily in non-euro area markets or with non-euro area firms, the direct impact of the EMU decision might be more muted, though any longer-term change in the euro area's competitive environment and trading patterns could have substantial implications. UK firms which have concentrated on the domestic market due to exchange rate-related concerns and costs, meanwhile, would benefit considerably from the opportunities opened up by a larger market and increased competition.

**6.8** The sectoral impact of EMU would be felt not only by individual firms but also through the entry and exit of firms. Méltz (2002), for example, argues that exposure to trade produces an overall welfare gain not because it necessarily improves the productivity of an individual firm, but because it encourages the more productive firms to enter the export market and benefit via increased market share and profits.

**6.9** Given that the UK has traditionally been a relatively open economy, the potential impact of EMU entry on the overall UK trade propensity might not be as large as in those euro area countries which start from a more 'closed' position. This does not, however, mean that UK businesses would therefore feel little EMU effect in absolute terms. Increased openness elsewhere in the euro area would mean new opportunities for UK industry. It would also imply increased competition for UK firms at home and in euro area and third country export markets.

**6.10** National export and import propensities conceal large sectoral differences. EMU entry would, by altering competitive conditions, affect the inter-sectoral balance of UK investment, FDI, trade and profits. Increased openness to trade is also, over the long term, an important influence on location and concentration. Hallet (2000) finds traded goods sectors to be the most spatially concentrated. The scope for non-traded goods such as construction and transport and communication services to concentrate is constrained because their location tends to follow the distribution of purchasing power.

**6.11** When sectors are insulated from competition by regulation, state ownership or procurement practices, the impact of the euro will be dampened. Some analysis suggests that the influence of discriminatory government procurement on specialisation can generate countervailing pressure to other agglomeration forces. Brülhart and Trionfetti (1998) argue that in industries which are sensitive to public procurement, other influences on location lose their significance. More liberalised procurement leads to stronger geographical concentration in these industries.

### Box 6.1: Potential impact of EMU: openness and exchange rate sensitivity

The **hotel and restaurant** sector is, in many cities and regions, exchange rate sensitive. Bookings and reservations in internationally popular destinations may rise or fall with currency movements, and currency volatility between booking and actually travelling can leave the customer or provider exposed. Exchange rate exposure is similarly problematic for industries which have a considerable lag between production costs and payment, either because the production process is lengthy (e.g. **shipbuilding**) or because output is stockpiled to meet seasonal demand. The removal of intra-euro area exchange rate volatility could be of substantial benefit to UK firms and consumers in these sectors, facilitating long-term planning, investment, purchasing and marketing decisions.

Sectors which are protected (e.g. some **agricultural sectors**) or have a strong element of state provision (e.g. **education**) tend to be relatively insulated from currency fluctuations. While open to trade, sectors dominated by multinational enterprises (MNEs) such as **petrochemicals** may have their currency sensitivity reduced by the ability of MNEs to absorb currency risk within the group, dampening the direct impact of EMU on such firms.

The **retail trade** derives little of its turnover from export markets (though much of its input is imported at some point in the supply chain, meaning that some exchange rate volatility may be reflected in prices or margins). Retail sales to consumers are typically localised; hence the existence of a very large number of small enterprises – there were 1.8 million non-food retail enterprises across the EU in 1999.<sup>a</sup> **Residential real estate and letting services** are, with the exception of the very top end of the market (which, especially in London, has a significant non-domestic customer component), also relatively protected from direct export and currency considerations. So, too, are **retail financial and insurance services**. It is unlikely that UK retail services would be exposed to greater direct competition as a result of EMU entry. However, greater competition along the supply chain, as well as the implications for restructuring of capital market integration, would still imply new opportunities and challenges for firms even in these apparently insulated sectors.

EMU membership eradicates some but not all exchange rate volatility. The extent to which it does so depends on how much trade is with the euro area. Sectors in which the main competition to UK firms resides outside the euro area would be affected by EMU entry differently to those which compete primarily with euro area firms.

EU manufacturing sectors which are sensitive to exchange rate volatility, but compete mainly with US dollar-based firms, include **machinery and equipment, electrical and optical products, and transport equipment**.<sup>b</sup> Within the UK, sectors for which exchange rate volatility against the US dollar could be of particular concern include **ceramics, computers, professional goods and non-ferrous metals**. **Wood, rubber and plastics, non-metallic minerals and basic and fabricated metals** are, by contrast, much less exchange rate sensitive and US dollar exposed.

<sup>a</sup> Fouquin *et al.* (2001).

<sup>b</sup> European Commission, Eurostat (2002).

## Pricing behaviour

**6.12** EMU entry and a subsequent increase in competitive pressure might affect pricing behaviour in some sectors. The magnitude of this would vary with:

- the pace and degree of price convergence in different markets and at different stages of the supply chain;
- the currency of pricing;
- the scope for producers to dictate prices; and/or
- the extent to which euro area customers exhibit an increasing preference for domestic currency pricing.

**Price convergence** **6.13** The EMU study by HM Treasury *Prices and EMU* looks in detail at the theory of price convergence. It shows that prices are determined by costs, the level of competition and demand. Exchange rates, differences in costs and differences in the degree of competition can maintain price differentials between countries; the ability to conduct trade and arbitrage across borders should increase competition and put downward pressure on prices.

**6.14** The EMU study *Prices and EMU* suggests that UK entry to EMU might have variable impacts on sectoral prices. Where UK prices currently lie within the price range of the large Member States (France, Germany, Spain and Italy), price pressure would be limited. Tradeable goods would be subject to greater price pressure than non-tradeables, though the expansion of the Internet as a search and purchase tool means that the proportion of goods and services which are 'non-tradeable' is diminishing.

**6.15** Different sectors may experience different rates of convergence of both consumer and producer prices and from different starting points, since initial producer and consumer price levels in a sector might differ between countries. As Box 6.2 illustrates, with reference to specific examples, branding might inhibit price convergence as might strong national preferences. EMU entry might imply only limited pressure on market share, and hence on prices, for UK firms in these sectors (though it could also prompt increased advertising and branding expenditure by some, as a precautionary measure). Overall, the pressure on companies' profit margins from EMU-generated price convergence – and hence the impetus for restructuring – will be very different between sectors and countries (Andr n and Oxelheim, 2002).

**Currency of pricing** **6.16** Some sectors produce commodity goods for which prices are determined on world markets in a particular currency (often the US dollar). Increased trade and competition stemming from EMU entry would have little impact on such firms as they are already exposed to global competition. They could, however, benefit from increased exchange rate certainty to the degree that they trade within the euro area. If firms' costs are fixed in their domestic currency and they cannot adjust prices when exchange rates fluctuate (as will almost certainly be the case in the short run), exchange rate changes can have a substantial effect on profitability.

**Pricing strategies** **6.17** Exporters that price their goods in the customer's (foreign) currency will experience changes in their own mark-up from exchange rate movements, but demand for their goods abroad should remain stable. Firms which choose to price their exports in their own domestic currency maintain stability of mark-up, but risk shifts in demand as the foreign price of their goods alters with the exchange rate. In both cases, exchange rate volatility potentially affects profits, but via different means. Pricing in the exporter's currency is positively related to the market share of the exporting country, 'country' size and shared currency-origin of competitors. A UK firm which trades primarily with non-euro area markets, such as the US, might over the long term find its pricing power enhanced by UK EMU entry.

**Consumer pricing preferences** **6.18** One interesting question concerns the extent to which retail or business customers might become accustomed to intra-euro area ease of price comparison and the absence of exchange rate risk, and therefore begin to confine their product searches to euro area companies (or, more accurately, to companies prepared to price their products in euros) or oblige non-euro area suppliers to price in euros.

**6.19** A shift of exchange rate risk onto non-euro area firms would affect industries accustomed to pricing and invoicing in their (non-euro area) domestic currency. Were the UK to remain outside EMU, adjusting to the change in circumstances could be particularly onerous for smaller companies, giving them a further disincentive to export. Multinationals based outside the euro area might, given their ability to offset exchange rate risk within the group, enjoy an increased advantage relative to their single location counterparts.

#### **Box 6.2: Potential impact of EMU: pricing behaviour**

EMU may have little impact on sectors which produce goods that are priced on world markets in a particular currency. **Chemicals** prices in Europe have historically been **Deutschmark**-based and are now euro-related. **Petrochemicals** and **oil and gas**, by contrast, are based in **US dollars**; so, too is the **aerospace** industry (in which euro-denominated contracts tend to be converted into **US dollars** to facilitate comparison with **Boeing**). The UK has the largest aerospace industry in the EU. It also has a more direct involvement than other Member States in the **US market**. As the European market becomes more open and integrated, however, competition from euro area firms is increasing. Of interest over the longer term will be the extent to which large **US customers** involved in consortia activity begin to demand euro contracting from their suppliers.<sup>a</sup>

Sectors in which EMU entry would be unlikely to facilitate major price convergence include: commodity products, such as **steel**<sup>b</sup>, sectors in which prices are already within the range of other large EMU members, such as **food** and **non-alcoholic beverages**; industries where markets are segmented by strong national preferences, such as **domestic electrical appliances**; and industries where branding is a major influence on customer choice, such as **watches, shoes and sports clothing**<sup>c</sup> (though customer preferences are not set in stone and revealed price differentials may encourage shifts).

**Car pricing** has come under both European Commission and national spotlights in recent years. Nevertheless, price differentials remain substantial. Empirical evidence suggests that taxes, exchange rates, dealer margins, specifications and right-hand drive surcharges account for only part of the differentials; the marketing power generated by the old cars block exemption has allowed manufacturers effectively to segment the Single Market. New rules from October 2003 will, however, allow dealers to market their services freely across the Single Market and open up the service and repair markets to greater competition.

<sup>a</sup> Society of British Aerospace Companies (2002).

<sup>b</sup> European Commission, DG Internal Market (1996b).

<sup>c</sup> See Cordell (1992), Burse (2002) and the Wall Street Journal (2002).

## Market structure

**6.20** The potential impact of EMU membership will depend in part on a sector's market structure; the existing degree of contestability in the sector, by the ability of existing producers to defend their market share and the ability of existing and potential producers to exploit the change in circumstances. EMU's impact is likely to be greater on industries in which:

- product differentiation is weak;
- acquisition opportunity (or potential) is high;
- the cost to customers of arbitrage, relative to the reward, is low; and/or
- sunk costs are similar for all new entrants, rather than determined in part at firm level.

**Product differentiation** **6.21** Firms in some sectors will be better placed than in others to retain market power in a more competitive euro area environment. Branding, for example, gives firms a degree of market power. Where products are differentiated, customer preference may be shaped by a range of factors besides price and quality, such as image, reputation, social or political consciousness and product origin. Examples of sectors where national preferences are important are included in Box 6.3. Where technology and advertising afford UK producers or retailers a degree of market power, trade in these differentiated products will tend to react differently to trade in homogeneous products as transaction costs fall.

**Acquisition potential** **6.22** This does not mean that producers of branded goods or services are insulated from EMU's effects. If EMU promotes capital market integration, and hence merger and acquisition activity, this will also affect differentiated sectors. Furthermore, non-differentiated product sectors are often already relatively specialised, limiting the scope for further change in this direction. Brühlhart (2001), for example, finds that the most specialised sectors tend to be the traditional low-tech, labour-intensive and resource-intensive industries – precisely those which tend to display low product differentiation.

**6.23** Producer power is bolstered not only by brand loyalty but also by the inconvenience to customers of switching suppliers. Shifting word processing systems, for example, may be prohibitively expensive in terms of both time and money, however attractive the alternative appears on paper.

**Costs of arbitrage** **6.24** High arbitrage costs, in terms of search, delivery and uncertainty, constitute an effective barrier against entry. The willingness of consumers to take advantage of increased price transparency will depend in part on the costs of arbitrage, both in absolute terms and relative to the product price. Consumers may be prepared to spend several hours researching the possibility of saving 5 per cent on the purchase price of, for example, a computer, but are unlikely to consider the same time well spent to purchase a cheaper box of breakfast cereal.

**6.25** Arbitrage in branded goods is facilitated by the presence of large retail chains. Pan-European retail chains have not yet generally developed to the same extent as US-wide counterparts such as Wal-Mart. Retail formats do not, with some exceptions (e.g. IKEA), appear to travel easily across European borders. While retailing is quite concentrated in some Member States such as the UK and France, the leading retailers tend to be different in each country.

**6.26** By improving information flows and levels, shortening distribution channels, encouraging out-sourcing and specialisation, and reducing barriers to entry (Cigan, 2002), the Internet and the euro may, in some sectors, have mutually reinforcing effects on competition and search costs, tilting the balance of advantage still further in the consumer's direction. The growth of Internet bookings in the travel and tourism sector illustrates the extent to which consumer behaviour may change as search costs fall. It also, however, reveals the limits of consumers' willingness to shop around, even when delivery costs and risks are low. Comparing flight prices is one thing; constructing complicated travel packages from a variety of sources is quite another.

**Sunk costs 6.27** Market and cost structure are an important determinant of what happens to industry concentration as trade barriers fall and the market expands. Most manufacturing industries entail investment in sunk costs. In some industries, and as described in particular by Sutton (1991), these costs (building an assembly plant, for example) are similar for all new entrants, and 'exogenous' (see Box 6.3 for some specific examples). In others, a large proportion of sunk costs may comprise R&D or advertising and hence be determined by the firm itself or 'endogenous'.<sup>1</sup>

**6.28** Industry concentration tends to decline as markets expand because the size of the minimum efficient plant falls in relation to the market. Where sunk costs are mainly exogenous, concentration may fall substantially as new firms enter the market. Where sunk costs are firm-determined, however, there will tend to be a lower limit to concentration. In sectors such as pharmaceuticals and confectionery, EMU entry might, for example, prompt increased advertising expenditure in order to maintain market share. The competitive escalation of endogenous sunk costs makes market entry more difficult; EMU is unlikely, of itself, to eradicate the prime-mover advantage often characteristic of such industries. As Sutton notes, the US and UK own-label tinned soup markets – quite mature and similar – are dominated by Campbell and Heinz respectively. Each of these US companies retains the leadership in the market it entered first and is a weak second in the other.

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<sup>1</sup> See also Robinson and Chiang, 1996.

**Box 6.3: Potential impact of EMU: market structure**

If consumers are willing and able to compare products and prices, the potential effects of EMU on a sector may be large; not least, in industries where the increasing exploitation of the Internet is simultaneously reducing search costs and helping to improve both business-to-consumer and business-to-business relations. **Tourism and travel** is one such sector where the enhanced ability of consumers to compare and take advantage of price differentials has increased the pressure on existing firms and facilitated the emergence of new entrants and the exit of some incumbents. The extra convenience and transparency provided by the single currency could tip the balance of market power still further towards the purchaser, thereby adding to the pressure for restructuring and creating both opportunities and challenges for UK firms.

In contrast, sectors in which strong national tastes constrain the development of pan-European brands may feel only a limited direct impact on supplier and consumer behaviour from EMU (though will still be open to the effects of capital market integration on funding and ownership). The 'white goods' or **domestic electrical appliances** industry is one such sector,<sup>a</sup> characterised by a high degree of integration in production but only limited integration of markets. Strong brands rarely cross national borders and consumers are dissuaded from shopping for bulky white goods too far from home by the expense of shipping, concern over after-sales service and a preference for familiar brands or national safety certificates.

UK producers of relatively undifferentiated products may also be insulated to some extent from the direct effects of the euro. Such industries tend already to be globalised, leaving individual producers with little market power. The **steel** industry, for example, produces commodity products to specific standards and it is an intensive user of R&D, though not of advertising. The largest producer in 2000 – Nippon Steel – had a global market share of only 3.4 per cent.<sup>b</sup> UK steel producers already operate in a global environment in which intra-EU trade is sensitive to changes in relative unit costs.<sup>c</sup> The impact of the EMU decision on such firms' market structure would be limited.

The impact of EMU entry on industrial concentration will depend, in part, on firms' cost structures. Where sunk costs are similar for all firms (as in, for example, **cement** or **iron** and **steel**), the expanded market engendered by EMU would suggest decreasing industrial concentration.

In contrast, industrial concentration among UK firms might be expected to prove more resilient in sectors where sunk costs are, in part, firm-determined: in, for example, R&D-intensive sectors (e.g. **industrial and agricultural chemicals** and **aerospace**); in advertising-intensive sectors (**confectionery** and **soft drinks**); and in sectors with high expenditure on both R&D and advertising (**pharmaceuticals**, **soaps** and **detergents**). EMU entry might encourage increased expenditure by UK firms in such sectors in order to maintain market share.

<sup>a</sup> Baden-Fuller and Stopford (1991).

<sup>b</sup> European Commission, Eurostat (2002).

<sup>c</sup> Humphry (2000).

## Firm size

**6.29** As has already been noted in this section and throughout the study, the size distribution of firms within a sector is a potentially important influence on the impact which EMU membership would have on that sector:

- the abolition of intra-euro area exchange rate volatility and exchange rate transaction costs is likely to be of disproportionate benefit to small firms;
- absolute cost savings will be greater for large companies;
- the importance of multinational enterprises may increase; and/or
- agglomeration may be encouraged.

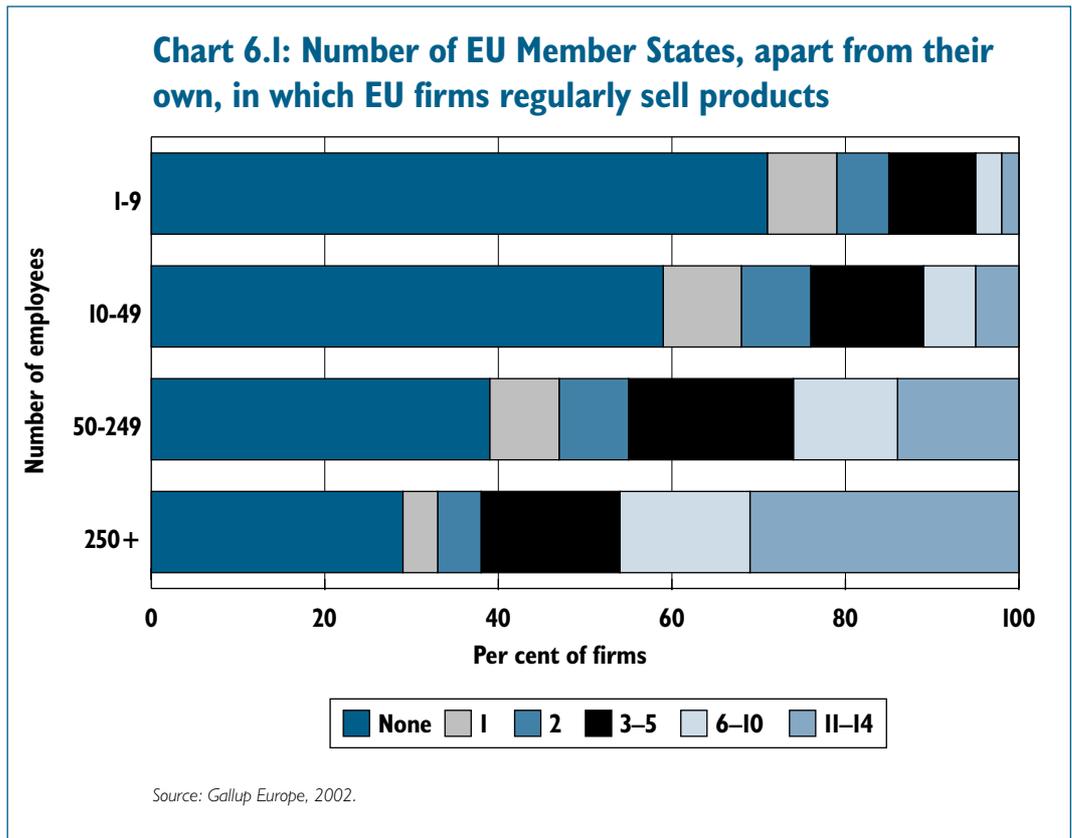
**Lower transaction costs** **6.30** In *absolute* terms, exchange transaction savings will be greater for larger firms, which have a higher propensity to trade (Bannock Consulting, 2001). Firm size and export activity are generally positively related,<sup>2</sup> as Chart 6.1 which is drawn from the European Commission's 2002 *Internal Market Scoreboard*, illustrates.<sup>3</sup>

**6.31** Small and medium-sized enterprises (SMEs) are, however, likely to benefit disproportionately in *relative* terms from reduced conversion costs and exchange rate volatility. Large companies can spread costs, both of money and time, over higher volumes and because of greater transaction sizes may be better able to hedge currency risk. For smaller firms, the cost (or perceived cost) of hedging may be so high as to preclude overseas trade.

**6.32** SME export sales also tend to be confined to a more limited number of product and geographical markets than those larger firms. Of the almost 6,000 companies surveyed in the European Commission's *Internal Market Scoreboard* (Gallup Europe, 2002), firms with less than 10 employees exported, on average, to just over one other Member State while those with over 250 employees exported to over six other Member States. Being less diversified than their larger counterparts SME exporters enjoy far less 'natural' hedging against exchange rate risk. This provides a further reason to expect reduced real exchange rate volatility to be to their particular benefit, and to look for an increased propensity to trade as a consequence. More detailed examples of the firm size characteristics of particular sectors are provided in Box 6.4.

<sup>2</sup> The major exception to this is wholesale trade, where small firms have a higher propensity to export than large. This reflects large and small companies filling different roles as wholesalers; small firms are generally involved in trade activities, and larger enterprises in distribution – still primarily a domestic activity. See European Commission, DG Enterprise (2002a).

<sup>3</sup> Gallup Europe (2002).



**6.33** The impact on investment of EMU entry might similarly be particularly marked among small UK firms if lower trade barriers and more integrated capital markets provided access to international capital markets for a wider number of companies, as the analysis of Section 3 suggests.

#### Implications for MNEs

**6.34** At the opposite end of the size spectrum from SMEs, multinational enterprises (MNEs) are also well-placed to exploit the opportunities of scale and scope offered by a more integrated euro area (see Box 6.4 for examples of sectors characterised by MNEs). As is discussed further below, MNEs appear to enjoy inherent productivity advantages relative to single-location firms. The removal of national exchange rate barriers within the euro area might allow UK MNEs to exploit this advantage to an even greater extent via increased market, buying or branding power.

**6.35** Given EMU's potential consequences for capital market integration and hence for greater merger and acquisition activity, the euro area might, in time, be characterised by a greater number of MNEs than would otherwise have been the case. This could benefit aggregate euro area productivity and employment, while entailing varying adjustment costs.

#### Agglomeration

**6.36** If EMU promotes openness and trade, it may also promote industrial agglomeration – geographic concentration over and above that which would be suggested by the 'normal' industry concentration. Contrary to common perceptions, clusters are not composed solely of small firms. A survey of 34 regional clusters over the decade to 2001 found that the number of MNEs rose in 17 clusters and declined in only one, while only five clusters had no MNEs among their major firms.<sup>4</sup>

<sup>4</sup> European Commission, DG Enterprise (2002b).

**6.37** Amiti and Pissarides (2002) argue that a key motivation behind clustering is the improvement in the quality of job matches when firms are able to recruit from a larger pool of labour. High trade costs, however, make it more profitable for firms to locate in the market they supply rather than where productivity is highest.

**6.38** If EMU were to reduce trade costs, it might – in a labour market characterised by heterogeneous skills – boost agglomeration. Where this reflects firms relocating (as opposed to influencing the start-up location), it would affect primarily medium and large sized firms. Small businesses tend to have much stronger ties to their local communities in terms of both customers and finance and to be considerably less mobile than their larger counterparts.

**6.39** In some sectors, EMU entry might encourage agglomeration in centres outside the UK. In others, agglomeration might occur within the UK, building on UK sector-specific advantages in terms of skills or resources, or the overall business environment. EMU entry increases the need for flexibility and adaptability on the part of national economies, sectors and firms.

**Box 6.4: Potential impact of EMU: firm size**

Sectors dominated by very large companies may be characterised by high returns to scale and high entry costs; they may be very globalised (such that a firm which appears dominant in a national context has in fact very little market power, being in strong competition with firms based overseas); or – at an opposite extreme – they may be highly protected (e.g. a state monopoly). The direct impact of EMU is reduced in each case by its only limited implications for firm entry and exit, and competitive pressure. The barriers to entry either remain high and unaffected by EMU or were low to begin with. Sectors such as **cars, pharmaceuticals, mineral oil or aerospace**, which already operate in a global environment characterised by high entry costs, are unlikely to come under significant additional pressure to restructure from EMU.

The smaller-sized suppliers to such sectors may, however, be affected to a much greater extent. The margins of **car component manufacturers** are, for example, already being squeezed globally by consolidation and cost-cutting on the part of the car manufacturers they supply. Concentration and globalisation of demand increases pressure for globalisation of supply. EMU may exacerbate this pressure for restructuring in the euro area car component sector by enhancing the ability of car manufacturers to compare and shift between suppliers.

Industries characterised by small businesses serving primarily localised markets are unlikely to be strongly affected by EMU (though they will not be entirely insulated since improved access to markets and funding for the larger firms in these sectors will lead to increased competitive pressure and, perhaps, industry consolidation). **Construction** is dominated by micro-enterprises of less than 10 people (in the UK, 98 per cent of construction enterprises and 62 per cent of employment<sup>a</sup>), as is **motor distribution** (though **retailing** in general is more complex, with both very small and very large firms accounting for a high proportion of turnover and employment).

Some industries (though not in all countries) are characterised less by a preponderance of small companies *per se*, than by clusters of small companies: **textiles** in Italy, for example; **leather goods** in Spain; and **lace, ceramics, cutlery and hosiery** in the UK. Industries prone to clustering tend to be older-established, less high-tech and less skilled than their less agglomerated counterparts. This does not, however, mean that they are therefore uncompetitive or prone to inertia. The advantages of a network of suppliers, local specialist skills, knowledge spillovers, investor familiarity with the industry, and a reputation which is generally established in export as well as domestic markets may mean that clusters are well-placed to benefit from the reduction in trade and investment barriers brought about by EMU.

In **software** and other 'new' industries, a few dominant large companies may face continuous strong competition from niche players or entrants in a fast changing marketplace. Competition in such sectors stems less from a product being improved or made more efficiently than from entirely new products rendering their predecessors redundant. EMU works both to reinforce and undermine the position of the dominant players. Smaller, newer enterprises benefit from enhanced funding opportunities and larger marketplaces. Larger enterprises may, however, be better able to exploit stronger brand names and pursue innovation via acquisition, facilitating the development of multinationals.

<sup>a</sup> Small Business Service.

## Financing and ownership

**6.40** The impact of EMU on the cost and availability of finance is detailed in the EMU study by HM Treasury *EMU and the cost of capital* and is summarised in Section 3. The impact of EMU on financing and ownership may be greater in sectors in which firms:

- are highly reliant on external funding;
- have experience of raising funds on national capital markets but not on international markets;
- operate in relatively specialised or new fields;
- have the capacity to absorb FDI or form alliances; and/or
- have separation of managerial control and ownership.

### The use of external funding

**6.41** By opening up broader access for UK firms to international capital markets, EMU would entail obvious benefits for sectors which make extensive use of external financing. It carries particular benefits, however, for those in which a significant number of firms have experience of raising funds in domestic capital markets but have not yet (for reasons of cost, lack of information or risk) done the same on international markets. UK firms may be more accustomed than their counterparts in some euro area countries to raising market finance and hence well-placed to take quick advantage of the new opportunities opened up by EMU entry. Firms with experience of advising companies looking to raise market finance, a traditional UK strength, should be similarly well-placed.

**6.42** If this were to result in a shift from bank borrowing to capital market borrowing, it might render some sectors more vulnerable to financial market volatility. At the same time, however, by broadening the range of funding alternatives open to businesses, EMU also potentially offers an offsetting measure of stability.

**6.43** It seems unlikely that EMU entry would lead to an immediate and significant increase in competition to lend to UK SMEs. SMEs, particularly at the smaller end of the size bracket, are often reluctant to switch from traditional lenders. In the longer term, however, EMU has the potential to increase competition among bank lenders and so reduce the cost of borrowing for SMEs.

### Ownership and restructuring

**6.44** What matters for growth and productivity is not simply the amount of funding available, but the way in which it is monitored and used (sometimes identified as a traditional weakness of UK industry).<sup>5</sup> Merger and acquisition, especially of the hostile variety, is much more common in the UK than in the euro area. EMU will not, of itself, transform this picture; national ownership structures are a product of social, legal, historical and financial structures, and not simply of national currencies. Nevertheless, by reducing trade barriers and furthering capital market integration, EMU is likely to encourage restructuring not only, as has traditionally been the case in much of the euro area, through a change of management, but also through a change of ownership. This opens up new opportunities for UK firms looking to expand. It also implies, over the longer term, increased competition for UK firms from euro area firms looking to expand.

<sup>5</sup> Owen (1999).

**6.45** By facilitating cross-border investment activity, EMU may lend an increasingly international dimension to industrial restructuring. This has important consequences for corporate ownership, organisation and hence performance. Many studies find a performance gap between domestic and foreign-owned companies (for example, see Pain and van Welsum, 2002). Other work suggests that the performance gap is between domestic firms and multinationals, rather than between domestic and foreign-owned firms (for example, see Pfaffermayr and Bellak 2000, Doms and Jensen 1998, and Criscuolo and Martin 2002).

**6.46** Haskel *et al.* (2002) identify productivity gains not simply for the firms taken into foreign ownership, but also for the sector as a whole. They find that a 10 per cent increase in foreign presence in a UK industry typically raises total factor productivity of that industry's domestic plants by 0.5 per cent. Such findings are, however, not undisputed. Griffith and Simpson (2001) argue that domestic UK establishments which become foreign-owned do not enjoy higher labour productivity, though their productivity does improve faster than that of establishments which shift from foreign to domestic ownership. Box 6.5 provides examples of UK sectors where foreign ownership is important.

**6.47** If a single currency encourages FDI flows, it will not do so to the same extent across all sectors. EMU entry would be expected to affect not only the level of FDI, but also its composition. The removal of currency risk would not, for example, do much to enhance the appeal to manufacturers of a location which lacked an adequate freight infrastructure; it might, however, persuade some service providers to view the region in a different light. As noted by one executive interviewed by the Financial Times *"All you need for an IT helpdesk to function is a secure connection. But if you want to manufacture semiconductor chips, your infrastructure has to be world-class"*.<sup>6</sup>

#### **Management and ownership**

**6.48** Griffith (2001) found that the efficiency improvements stemming from the SMP occurred only in firms with a 'principal agent' structure (group or managerial establishment, plants with subsidiary or sibling plants, or foreign ownership), and not in single owner or entrepreneurial firms. Managerial control and ownership are assumed to be much more separate in the former group than in the latter, suggesting that increased product market competition stemming from the SMP was particularly effective in reducing agency costs. Given the traditional openness of the UK economy to FDI, and the principal agent structure of many of its firms, UK industry should be relatively well placed to benefit from any similar such effect delivered by EMU entry.

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<sup>6</sup> Financial Times (2002b).

**Box 6.5: Potential impact of EMU: financing and ownership**

Most enterprises in most sectors derive the bulk of their finance from internally-generated funds. Nevertheless, EMU's impact on the cost and availability of finance is an important consideration. By removing intra-euro area exchange rate risk, EMU potentially facilitates cross-border investment within the euro area by institutional and retail investors. This could be of particular benefit to UK firms in sectors which are highly reliant on capital market finance (whether equities or bonds), such as research-intensive and 'new' industries, e.g. **biotechnology**. The biotechnology industry raised record sums in 1999 and 2000, but the market downturn of 2001 and 2002 resulted in a cash crisis for some companies and expectations among investors of consolidation within the sector.

Sectors characterised by small, 'traditional' businesses, in contrast, tend to turn to banks rather than to capital markets for funding. The majority of **household service** or **construction** companies, for example, are small enterprises which rely primarily on bank lending for external finance. It is unlikely that EMU entry would have a substantive impact on the local banking relationships of UK SMEs.

The primary sources of external funding in any sector may change if the structure and ownership of that sector change. Such a shift may occur with, for example, privatisation; with the opening up of a protected sector to competition; or with a change in sector circumstances reflecting, for example, technological advances. The **telecommunications** sector has been subject to all three influences and its restructuring over the past decade has been both accompanied and facilitated by major borrowing on the part of both telephone services operators and telecommunications equipment producers. Consolidation and a sharp rise in external funding has also been a feature of the **media** industry.

The investment banking industry benefited from this increased demand for funding during the late 1990s and has suffered during the subsequent downturn (which has also affected its own demand for acquisition-related funding). The restructuring and expansion of the financial services sector, both in the UK and globally, has shaped the pace and direction of industrial restructuring in general, just as the process of industrial restructuring in non-financial sectors has shaped the responses of investors and financial intermediaries. The implications of EMU entry for the UK financial services sector are explored in more detail in the EMU study *The location of financial activity and the euro*.

Foreign ownership of UK firms is particularly marked in the **car**, **oil** and **machinery and equipment** sectors. Foreign-owned affiliates accounted in 1998 for almost 84 per cent of UK auto sector turnover and gross operating surplus and almost 89 per cent of investment.<sup>a</sup>

Strategic alliances, both horizontal and vertical, have grown larger and more complex, and are characteristic of a broad range of sectors including **chemicals and pharmaceuticals**, and **computers**. If EMU entry were to result in a more competitive environment, this might encourage UK firms to explore further such opportunities with an increasing number of potential partners, to their benefit and that of their customers.

<sup>a</sup> Per cent of total enterprises with over 250 employees (OECD, 2002b).

## Cyclicalities

**6.49** Sectors and markets are continually subjected to change, both cyclical and structural. At an aggregate level, the impact on industry of product market fluctuations may have increased in recent years as more sectors have become exposed to international trade and as the number of protected, highly regulated or state-owned industries has declined. Were the loss of an independent monetary policy to lead to more pronounced economic cycles, EMU entry would have a greater impact on sectors which:

- face highly cyclical demand for their output; or
- find cyclicalities to be particularly damaging.

**6.50** If the EMU environment is one of more volatile demand – and the transition phase may be even if the long-term context is not – different industries will be affected in different ways. Industries which produce investment goods or consumer durables tend to face more cyclical demand patterns than those which produce non-durables, since purchase decisions can be more easily postponed during economic downturns. UK firms which operate in cyclical industries, but which have diversified into other activities or have pursued product differentiation (or are in a better position to do so), might find it easier to adjust to the new environment than their equally cyclical but less diversified competitors. Box 6.6 provides examples of sectors which tend to be particularly sensitive to the cycle.

**6.51** A change in the volatility of short-term interest rates – set within EMU for the euro area as a whole rather than for any individual member – would have a particular impact on sectors in which demand is especially sensitive to short-term interest rates, such as estate agents. Any longer-term impact of the change in the monetary policy environment on borrowing patterns, such as the proportion of borrowing undertaken at variable or short-term interest rates, would also affect these sectors.

**6.52** Some sectors which produce goods that are not themselves highly cyclical may nevertheless find increased cyclicalities to be particularly damaging. Such industries might include, for example, those producing commodity-type products such as steel, cement or commodity chemicals. Prices in such sectors tend, during downturns, to be pushed down towards marginal cost levels, making it difficult for firms to recover fixed costs over the economic cycle.

**6.53** The form which industrial restructuring takes is itself cyclical. Merger and acquisition activity rises with financial markets and buoyant economic data; declining confidence and rising interest rates tend to be accompanied instead by downsizing, cost-cutting and consolidation. A potentially more volatile UK economic cycle within EMU could have consequences not only for the extent of restructuring undertaken by UK firms but also for the way in which that restructuring occurred.

**Box 6.6: Potential impact of EMU: cyclicalities**

Sectors producing investment goods (such as **machinery and equipment** or **consumer durables**) tend to be especially sensitive to the economic cycle. Others are less inherently cyclical in terms of their product line but find increased cyclicalities damaging. UK firms in capital-intensive industries such as **steel, cement** and **commodity chemicals** might find it more difficult to recover their fixed costs in an even more cyclical environment. Rationalisation in many such sectors is fuelled by excess capacity, as well as by an ongoing reappraisal of production, delivery and marketing systems in the face of rapid technological change.

Demand in some sectors, such as **estate agents**, is particularly sensitive to the short-term interest rate cycle. The shift in the monetary policy environment accompanying EMU entry could be of obvious consequence for UK firms in such industries, the magnitude of the effect being a function of both the step adjustment in the level of interest rates and the impact on expectations of future interest rates. A change in the volatility of short-term interest rates or, over the longer term, in borrowing patterns (such as the proportion of borrowing undertaken at variable or short-term interest rates) would also affect these sectors.

Industries which are relatively insensitive to economic or interest rate cycles (and which in terms of relative performance, may indeed be counter-cyclical), include **health care, food, consumer non-durables** and **tobacco**. Demand for tobacco products, for example, is highly price and income inelastic. Substantive changes in demand tend instead to reflect fashion, social change or health concerns (in response to which, manufacturers have diversified into, for example, accessories or clothing or sought out new markets).

Within the **car** industry, many of the major players have diversified into less cyclical sectors or into areas which can alleviate the impact of downturns on their primary activities. General Motors, for example, operates a large **financial services** company offering mortgage, business and auto financing; Ford Motor owns an auto financing company, as well as a large car rental firm; while Toyota runs a consumer finance company as well as producing vehicles.

**6.54** EMU entry implies a shift in the operating environment and hence entails a range of sometimes offsetting, sometimes exacerbating, consequences for industrial demand and supply. The introduction of greater competition in some sectors as barriers to trade and investment fall will affect patterns of demand (and hence employment, incomes, investment and location decisions) in other sectors. Furthermore, some UK firms and industries will respond more rapidly or efficiently to these changes than others, and more (or less) rapidly or efficiently than their counterparts in other euro area countries. Differences in the transition process to the new environment – in investment, training, marketing and location decisions – will themselves shape the eventual composition and distribution of the industrial base of the euro area and, whether the UK joins EMU or not, of the UK.

**7.1** This study set out to address the implications of possible UK entry to EMU from a microeconomic perspective, investigating the potential impact of EMU membership on UK business sectors. The consequences of EMU entry for the UK economy as a whole would not be distributed uniformly across all industries. However beneficial or costly the effect on the UK in aggregate, different business sectors could be presented with very different opportunities and challenges. The responses and reaction times of each industry would themselves affect the dynamics of industrial change and hence the long-term resilience and competitiveness of the UK in a European and global context.

**7.2** While UK industry shares many of the structural characteristics of its large euro area counterparts, there are nevertheless important differences which might imply a different UK response to a euro area wide shock. These include the UK's relatively large service sector, its large stock of foreign direct investment (in particular, from outside the EU) and its high level and proportion of service sector trade with non-EU countries.

**7.3** Economic theory suggests that EMU should have different effects over different time periods. This study therefore employs a dynamic framework which identifies the immediate effects of EMU entry, the short to medium-term impact and the longer-term implications.

**7.4** Both theory and a wide range of current and historical UK, EU and US evidence suggest that EMU will potentially foster increased trade, investment and cross-border investment. The evidence to date from the euro area is consistent with (or at least does not contradict) this expectation. By furthering the implementation of the Single Market Programme (in particular within service sectors), EMU is likely to lead, over the long term, to increased competition and augment an existing tendency of gradually increasing specialisation.

**7.5** The intensity and nature of EMU's effect on individual sectors, and therefore on UK business, if the UK were to join would vary with a number of different sector characteristics. In particular, six key characteristics are important: openness or exchange rate sensitivity, pricing behaviour, market structures, firm size, finance and ownership, and the volatility of demand.

**7.6** A fully quantified cost-benefit analysis of the potential impact of EMU entry on individual UK business sectors is not feasible, for reasons of data availability, reliability and complexity. Nevertheless, a combination of theory, evidence, history and comparison allows an informed judgement to be reached as to the potential dynamic consequences of EMU membership for the UK industrial base, and the possible implications for different industry sectors. The effect of membership of EMU would have to be gauged relative to a changing and evolving EU industrial landscape. The push to complete the Single Market in goods and services and the further integration of capital markets are key elements of this change. Against this backdrop, several conclusions can be drawn:

- the potential increase in competitive pressure generated by membership of EMU could occur through both product and capital markets. While open and exchange rate sensitive industries would feel the impact of EMU most directly, all sectors and firms – however domestic their focus – would be affected by improved access to capital which facilitated expansion and restructuring;

- increased competition would be of particular benefit in many service sectors which have, to date, been less exposed to the effects of the Single Market than the goods sector. Greater competition and openness would help to raise productivity (especially important in services which affect business competitiveness such as distribution or business services) and deliver substantial benefits to consumers;
- by removing a currency barrier to trade, and potentially improving access to funding, EMU membership should be of disproportionate benefit to small and medium-sized enterprises (albeit less so to micro-enterprises); and
- at the opposite end of the size spectrum, EMU could also facilitate the development of multinational enterprises. This could help to raise aggregate productivity.

**7.7** The potential increase in competition, trade and cross-border investment facilitated by EMU will help shape the euro area's industrial base and influence in the process the industrial structures of euro area trading partners and competitors. Irrespective of the UK's EMU decision, UK industries cannot avoid being affected by the euro, though the quantitative and qualitative effects and the adjustment costs will clearly differ. Inside or outside of EMU, its existence places an increased premium on the flexibility and resilience of UK firms, sectors and the economy as a whole.

**7.8** Whether or not the UK joins EMU, the Government is committed to creating the best possible environment for private enterprise and investment across all UK regions, sectors and industries. This is important for the Government's long-term economic goal of closing the productivity gap which exists between the UK and its major competitors. In the EU context, the Government is committed to the economic reform strategy agreed by EU Heads of Government or State at Lisbon in March 2000. The Government's vision is of a dynamic, job-creating EU characterised by full employment, high living standards and social cohesion. Challenging reforms of labour, product and capital markets are needed to achieve this goal.<sup>1</sup>

**7.9** The conclusions of this study are based on the assumption that, if the UK were to join EMU, it would do so on the basis of sustainable and durable convergence. If this were not the case, UK business sectors would be faced with an environment of greater macroeconomic instability and, over the longer term, potentially lower output and employment than would otherwise be the case. These issues are considered further in the Government's assessment of the five economic tests for EMU entry.

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<sup>1</sup> See *Meeting the Challenge: Economic Reform in Europe* (HM Treasury, 2003) for full details.

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# ANNEX A: THE THEORY OF INVESTMENT

**A1** This Annex sets out economic theory on the determinants of domestic investment and foreign direct investment.

## The determinants of domestic investment

**A2** Box A1 provides an overview of theoretical accounts of the determinants of investment. The neo-classical and dynamic models suggest that firms will invest if the returns from investment exceed the cost of capital. In general however, these theories perform poorly when tested against the data. The relationship between Tobin's Q and investment is, for example, usually found to be weak at an aggregate level. Similarly, empirical studies often show a weak link between investment and the cost of capital, but a stronger relationship with output (as would be predicted by the simple accelerator models) and profitability.

**A3** Recent economic research has attempted to address these weaknesses. Factors such as the level of innovation and the availability of skilled labour have been identified as important drivers of investment (see Nickell and Nicolitsas, 2000). The importance of capital market imperfections has also been emphasised, and is considered in detail in the EMU study by HM Treasury *EMU and the cost of capital*. One of the most important avenues of work has focused on the impact of uncertainty on investment. This is particularly relevant to this analysis, as EMU may have a significant impact on uncertainty through its impact on macroeconomic stability and the exchange rate. This issue is therefore the focus of the remainder of this annex.

### Box A1: Theories of investment

**Simple accelerator models of investment** assume there is an optimal capital stock for a given level of output and interest rates. In these models, investment shifts in response to a change in output or interest rates to keep the capital stock at the optimal level.

The **neoclassical theory of investment** suggests that a firm will invest until the marginal return from investment equals the marginal cost of capital (see, for example, Jorgensen, 1963). Two central factors drive investment in the simple neoclassical model: the return from investment, which is governed by the price and volume of output; and the cost of capital, which is determined by factors such as the interest rate, depreciation and tax.

A shortcoming of the simple neoclassical model is that it assumes that firms can instantaneously and costlessly adjust investment levels to reach the optimal capital stock, having equated the current marginal product of capital to the marginal cost of capital. There is also no explicit forward-looking element; no direct consideration of expectations of future profits. This is addressed in dynamic models of investment, of which **Tobin's Q** is an example (Tobin 1969). Tobin's Q is the ratio of the forward-looking stock market valuation of the firm (which approximates to the market's estimate of the present value of new investment) to the price of new equipment (which approximates to the marginal cost of capital). This relationship can be viewed as the ratio of the present value of marginal investment to the marginal cost of the investment. If Tobin's Q is greater than one, i.e. if the marginal value of investment exceeds marginal cost, then it makes sense for firms to invest more. The optimal level of investment, which corresponds to the neoclassical optimal capital stock, is where Tobin's Q equals one.

Work by Hayashi (1982) introduces **dynamic adjustment costs** into the neoclassical model, e.g., the cost of lost business due to installation of new equipment or the cost of retraining workers. These costs may increase with the size of the investment, with the result that a too rapid accumulation of capital may be inefficient. The optimal capital stock predicted under the neoclassical model may not be reached immediately, but represents a longer-run equilibrium which firms attempt to move towards.

**The impact of uncertainty on investment** **A4** One of the most important developments in the literature on the economic drivers of investment has been the increased importance attached to uncertainty. Dixit and Pindyck (1994) formulate a model where investment is irreversible and firms have the option to delay capital spending until some future point in time. In this case there is an ‘option value’ to delaying investment, as in the future a firm may obtain information which increases its certainty about the return from its prospective investment. This option value effectively increases the rate of return which a firm requires to invest. The option will have a higher value when economic variability is higher.

**A5** However, the theory on the impact of uncertainty on investment is not unambiguous. Early models suggested that uncertainty would raise investment levels. Assuming that returns are convex, a higher than expected price will increase returns by more than a lower than expected price (of comparable magnitude) would reduce returns. Therefore the possibility of receiving the higher or lower than expected price is preferable to the certainty of receiving the price midway between the two. More recent work, for example Abel and Eberly (1999) introduces costs to delaying investment into the Dixit and Pindyck (1994) option value model. This also makes the relationship between uncertainty and investment ambiguous. Others have argued that uncertainty may impact on the short-run dynamics of investment but should not affect the long-run rate of investment.<sup>1</sup>

**Empirical evidence on uncertainty and investment** **A6** However, empirical evidence has largely supported the conclusion that uncertainty has a negative impact on investment. Carruth *et al.* (2000a) survey this literature and find: “A general conclusion is that increased uncertainty, at both aggregate and disaggregate levels, leads to lower investment levels”.<sup>2</sup>

**A7** Carruth *et al.* (2002a) cite several examples of empirical analysis of aggregate UK investment which find a negative impact from uncertainty. For example, Price (1996) finds that uncertainty of output has a large and significant effect on long-run manufacturing investment levels in the UK. Driver and Moreton (1992) find that both output and inflation variance terms have negative effects on UK investment. Carruth *et al.* (2000b) use UK company panel data with uncertainty proxied as the producer price index, and find that sectoral uncertainty reduces investment. This effect is not confined to the UK, with several other studies finding similar results in the US and elsewhere.<sup>3</sup> Studies that have looked at disaggregated data are less conclusive, though still generally point to a negative relationship.

**Exchange rate volatility and investment** **A8** Empirical studies also show a link between exchange rate volatility and a reduction in aggregate investment. Darby *et al.* (1999) test for the impact on investment of both exchange rate volatility and misalignment in the UK, US, France and Germany. They find that, on average, exchange rate volatility reduces investment, though they do not find a long-run relationship between exchange rate volatility and investment in the UK. They also find that a long-run exchange rate misalignment from an equilibrium level has a negative impact on UK investment levels. Byrne and Davis (2002) analyse the impact of exchange rate volatility on aggregate investment across the G7, and find that both nominal and real exchange rate volatility reduce investment.

<sup>1</sup> See Bloom *et al.* (2001).

<sup>2</sup> Another review of this literature which reaches similar conclusions is Ashworth *et al.* (2001).

<sup>3</sup> See Carruth, *et al.* (2000a) for a complete review of this literature, and Deutsche Bundesbank (2001) which finds a strong negative relationship between investment and uncertainty.

**A9** Other studies find that the impact of exchange rate movements on investment varies across sectors. Investment is most likely to be affected by exchange rate volatility in low margin firms which find it difficult to adjust prices or in firms exposed to exchange rate volatility, i.e. exporters and importers. For example, Campa and Goldberg (1995) find that exchange rate appreciations reduce investment in low margin industries in the US, though the strength of the effect has been decreasing over time, which the authors attribute to increased exposure to imported inputs. Campa and Goldberg (1999) find that investment in low margin sectors in the US, UK and Japan is strongly responsive to persistent exchange rate movements. Nucci and Pozzolo (2001) find that investment is sensitive to exchange rates for low margin and small Italian manufacturing firms.

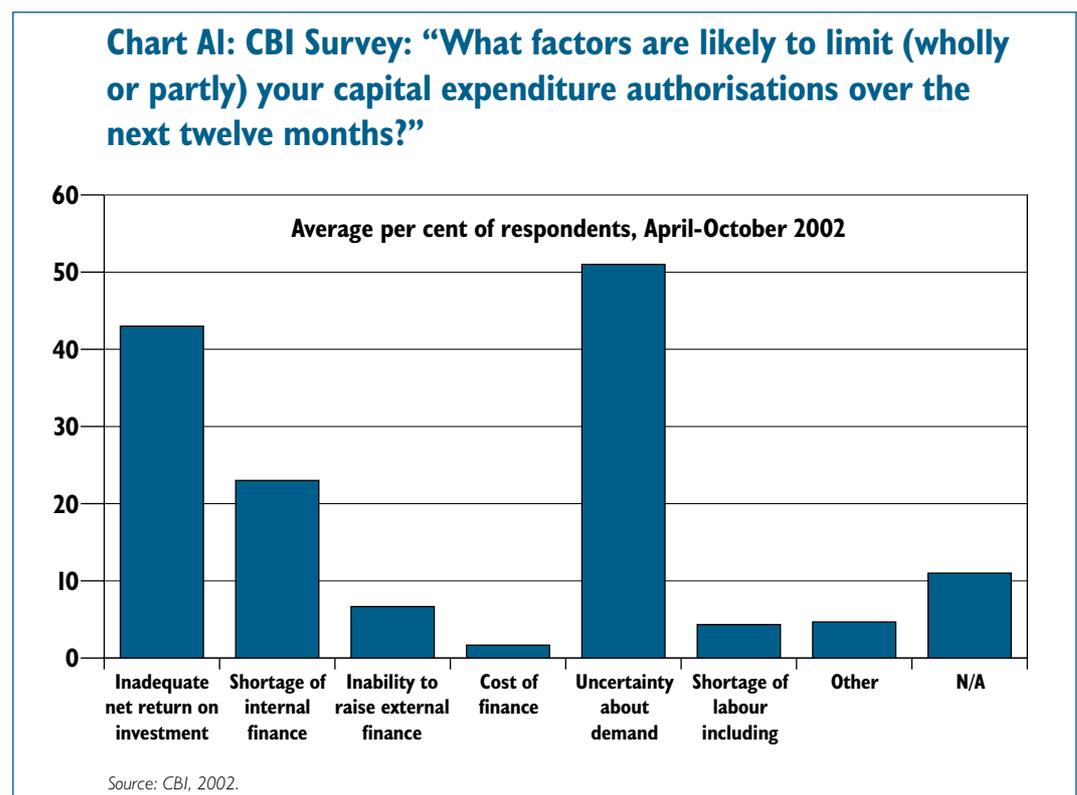
**Interaction with competition**

**A10** Analysis highlights the impact of market structure on investment. Caballero (1991) argues that the existence of imperfect competition is a necessary condition for any irreversibility-driven negative relationship between investment and uncertainty. An explanation is that where firms have a degree of market power there is less risk of competitors stepping in and investing earlier, thus foreclosing market opportunities. This means that the presence of a competitive market will generally tend to increase investment, as it will reduce the option value of delaying investment.<sup>4</sup>

**A11** By contrast, in a study of US manufacturing industries, Ghosal and Loungani (1995) find that, for industries with a high degree of product market competition, the effect of uncertainty on investment is negative and reasonably large. For relatively non-competitive industries, the impact is always small and not significantly different from zero. In a non-competitive industry, fear of pre-emption by a rival and the consequent need to act quickly, which play a more important role in oligopolistic industries, may counteract the desire to wait.

**Business surveys highlight the role of uncertainty and expected returns**

**A12** Business surveys such as the *CBI Industrial Trends Survey* (CBI, 2002) summarised in Chart A1, provide additional information on the determinants of investment. The most important factors identified by business in the CBI survey as limiting capital expenditure are inadequate net returns on proposed investment and uncertainty about demand. The net cost of capital is captured by responses on inadequate return and the cost of finance.



<sup>4</sup>For example see Guiso and Parigi (1999) and Carruth et al. (2000a).

**What are the key determinants of investment?**

**AI3** The key message of both economic theory and the evidence from economic studies and business surveys is that investment is determined by the relationship between the expected returns of investment and the expected cost of financing the investment. Firms will only invest if they believe the returns from investment will be greater than the costs. This will depend on a number of factors:

- the **returns from investment**, determined by the demand for and the price level of the output generated by the investment and by the costs of production. Expectations of demand, price and costs over the lifetime of the investment are therefore key determinants of expected returns. The degree of uncertainty attached to these expectations is crucial; and
- the **cost and availability of internal and external finance**, as higher costs of finance require greater returns to ensure that the investment is profitable.

### The determinants of foreign direct investment

**AI4** Economic theory concerning the location decisions of multinational firms is less developed than are many other areas of international economics. Existing theory is designed to answer the question of why firms decide to locate in more than one country, and centres on the ownership, location and internalisation framework:

- **ownership advantages** are those which a multinational firm possesses in terms of specific knowledge and organisational skills which allow the firm to compete effectively with domestic firms;
- **location** is determined by factors such as resources, trade barriers, transport costs and labour costs; and
- **internalisation** is the idea that it is more profitable to carry out certain transactions within firms (i.e. between parent and subsidiary companies) than between firms, and assumes firm-specific, knowledge-based assets that cannot easily or profitably be sold or transferred to other firms.

**AI5** While these characteristics explain why a firm may decide to locate outside its home country, they do not explain why multinational firms choose to locate in any particular country. Firms choose particular countries for a number of reasons including:

- **market-seeking** firms may choose to locate in a particular country to serve either the domestic market or to export to other countries, e.g. locating in one euro area country in order to export to others;
- **resource-seeking** firms seek specific resources which are unavailable in the home country; and
- **efficiency-seeking** firms choose to locate in a country that allows them to produce more efficiently, perhaps because of the availability of, for example, more productive labour.

**A16** Having established the motives for locating abroad and choosing a particular destination country, foreign direct investment (FDI) can be broadly categorised into two forms, vertical and horizontal, with differing implications for intra-industry trade:

- **vertical**, where different stages of production are located in different countries and the location choice is more likely to reflect factor endowment differences. For example, capital abundant countries export higher quality, capital intensive goods (finished computer products from the US), while labour abundant countries export lower quality, labour intensive goods used in the supply chain (semi-conductors from Malaysia); and
- **horizontal**, where the same final production activities are undertaken in different countries, e.g. European car manufacture. Trade is driven by product differentiation and internal scale economies. As countries become more similar in their economic characteristics (the availability and cost of labour for example), the flow of horizontal intra-industry trade would be expected to increase.

**A17** Overall, this analysis shows that the decision to invest overseas is affected by many factors. The UK's strong historical FDI performance is based on its attractive regulatory and tax regime; a stable macroeconomic environment; flexible labour and product markets; innovative capital markets; and a skilled labour force. Many of these factors will not be affected directly by EMU, and EMU entry should not necessarily detract from the UK's excellent record in attracting FDI.

#### FDI and the exchange rate

**A18** Among these many influences, however, one of obvious relevance to the decision of whether or not to join the single currency, is the exchange rate. The actual and expected levels of the exchange rate are important determinants of the decision to invest overseas. If firms are investing overseas in order to service export markets, the exchange rate will affect the profitability of that trade. Exchange rate movements also have potential implications for overseas investments which do not involve trade, as earnings from foreign subsidiaries have to be converted back into domestic currency.

**A19** As outlined in Box A2, there are two ways in which the exchange rate can affect FDI:

- exchange rate volatility, where a currency moves with high frequency around its short-run mean value; and
- persistent exchange rate deviation from some level of its medium or long-term equilibrium.

**A20** Box A2 suggests that a persistent exchange rate depreciation will increase FDI inflows, while a persistent appreciation will decrease them. It also suggests that exchange rate volatility has ambiguous effects on FDI flows. This is not a surprising result. FDI is heterogeneous and subject to a number of different influences, so is unlikely to behave uniformly in the face of exchange rate movements. Exchange rate volatility may dissuade some overseas investors from investing, but persuade others to invest in order to insure against risk through diversification.

**A21** Also important is the origin of the FDI, and the target market. Exchange rate risk will be very different for an investment which aims to service the domestic economy, and for an investment which aims to establish a base for exporting to EU countries or to non-EU countries. A third-country firm looking to export from an EU base will face currency volatility on exports to the euro area if it locates in the UK. However, if the firm services only the UK market, currency movements against the euro will not be as important.

**Box A2: Two exchange rate issues – volatility and deviation from trend**

Economic theory is ambiguous on the implications of **exchange rate volatility** on FDI. In the models of investment under uncertainty discussed in the section on domestic business investment (such as Dixit and Pindyck, 1994), uncertainty about future returns reduces FDI. The firm trades off the gains from entering a foreign market in one period with the opportunity cost of waiting until more information on risks and returns may have become available. The value of the ‘option to wait’ increases with the volatility of the underlying asset price. The greater the exchange rate volatility, the more likely the firm is to wait and see before entering the market.

Exchange rate volatility might, however, increase FDI. If volatility acts as a barrier to trade then firms may choose to invest as an alternative means of accessing markets, locating production in several different countries specifically to diversify risk. The ability to switch production between plants will also give a firm the flexibility to manage its costs in the presence of exchange rate risk (Pain, 2002). One reason for undertaking horizontal FDI may be to provide insurance against risk through diversification.

Empirical studies of the relationship between exchange rate volatility and FDI come to different conclusions. Hubert and Pain (2002) find that exchange rate volatility has a weak negative effect on FDI. Aizenman and Marion (2001) find a negative effect, but only for vertical FDI, suggesting that horizontal FDI is encouraged by volatility. Görg and Wakelin (2001) find no effect, while some earlier studies find that volatility has a positive impact on FDI (Goldberg and Kohlstad, 1994, Cushman, 1988).

The theory is less ambiguous as to the impact on FDI of a persistent **exchange rate deviation** from some measure of its long-run or medium run equilibrium, suggesting that a persistent depreciation will increase FDI, and a persistent appreciation will decrease it. With sticky asset prices, a lower currency can make a country’s assets (including its labour force) relatively cheap to overseas firms. Froot and Stein (1991) argue that FDI has an advantage in the presence of capital market imperfections: domestic currency depreciation raises the relative net worth of an overseas investor, making borrowing cheaper. FDI may also be used as a substitute for exports. Since depreciation makes overseas goods more expensive, foreign suppliers may instead produce directly in a country with a weak exchange rate.

Academic studies tend to confirm that depreciation raises incoming FDI, while an appreciation has the opposite effect.<sup>a</sup> Pain (1996), for example, finds that the location of UK FDI in Europe is sensitive to unit labour costs in the host country, suggesting that the relative exchange rate influences FDI flows. Pain and Hubert (2002) find similar results for German FDI in the EU, and Barrell and Pain (1999) likewise for FDI flows into the EU from the US. There are, however, outliers in the literature. Froot and Stein (1991), for example, draw the opposite conclusion.

<sup>a</sup> See Görg and Wakelin (2001), Kohlhagen (1977) and Campa (1994).

**Impact of EMU on UK FDI** **A22** This discussion suggests that although economic research does not pin-point an unambiguous effect on FDI from the removal of exchange rate volatility, this may mask important effects at the disaggregated and sectoral level. FDI into the UK which seeks to use the UK as an export base to the rest of the EU may be particularly affected by exchange rate risk. It should also be noted that economic research on the impact of exchange rate volatility on FDI has primarily considered past trends in bilateral FDI flows, and bilateral exchange rate volatility. This is a very different issue from the impact of UK entry into EMU on FDI, which represents an irreversible commitment to intra-euro area exchange rate stability. If some firms have been put off investing in the UK due to long-term currency risk, EMU entry might prompt them to reconsider.

**Impact on quality of FDI** **A23** As well as affecting the quantity of investment, the removal of exchange rate uncertainty and a reduction in transactions costs could also raise the quality of inward investment. An increase in trade and competition, induced by a reduction in uncertainty and transactions costs, might result in an increase in allocative efficiency. Pain (2002) suggests that such improvements in allocative efficiency can be explained by standard trade theories, which predict that trade will encourage a transfer of resources from import-substituting activities into activities in which countries have comparative advantage. This should result in more efficient, better quality FDI due to a shift in the pattern of inward investment towards activities characterised by comparative advantage.



## Indices of specialisation B1

The main indices of **specialisation** are:

- the **Herfindahl index of regional specialisation**; an absolute measure which sums the squares of industry shares in total regional activity. It takes values of between zero and one, with higher readings indicating greater specialisation;
- the **Krugman specialisation index**; a relative measure which sums the absolute difference of the structures of two regions. If both regions have the same structure, the reading is zero; if they have no industries in common, the reading is two;
- the **dissimilarity index of regional specialisation**; a relative measure which compares the industrial structure of a region with an average distribution across regions. It sums absolute differences between shares of industries in economic activity in a region, and their average value across regions by sector. A reading of zero indicates maximum diversity, and a reading of two, maximum specialisation; and
- the **Gini coefficient of regional specialisation**; a relative measure which assesses the equality of the distribution of industries in a given region, compared with that of, for example, the country as a whole. Readings range from zero (equal distribution) to one.

## Indices of concentration B2

The main indices of **concentration** are:

- the **Herfindahl index of geographical concentration**; an absolute measure which sums the squares of regions' shares in national employment in a particular industry. It takes values of between zero and one (a pure monopoly based in one region);
- the **dissimilarity index of geographical concentration**; a relative measure which sums the absolute differences between the shares of regional employment in a given industry and the share of national employment in that industry. A value of zero indicates equal distribution of a sector across regions;
- the **locational Gini coefficient**; a relative measure of concentration which assesses the equality of distribution of an industry across regions. Readings range from zero (equal distribution) to one; and
- indices of **spatial separation**. The previous concentration indices do not take into account the spatial dimension, i.e. whether the locations in which industry is concentrated are clustered together or widely dispersed. Midelfart-Knarvik *et al.* (2000) develop an index which has a value of zero if production occurs in a single place, and higher values as spatial separation increases.

**B3** Box B1 formally sets out the main indicators of specialisation and concentration.

**Box BI: Indicators of specialisation and concentration**

$i$  = industry

$j, k, l$  = regions

$S_{ij}^s$  = share of industry  $i$  in total employment of region  $j$  (specialisation)

$S_{ij}^c$  = share of region  $j$  in total employment of industry  $i$  (concentration)

$S_i$  = share of total employment in industry  $i$  in total employment

$S_j$  = share of total employment in industry  $j$  in total employment

$n$  = number of industries

$m$  = number of regions

**Herfindahl Index**

Regional specialisation measure

$$H_j^s = \sum_i (S_{ij}^s)^2$$

Geographical concentration measure

$$H_i^c = \sum_j (S_{ij}^c)^2$$

**Dissimilarity Index**

Specialisation measure

$$DSR_j = \sum_i |S_{ij}^s - S_i|$$

Concentration measure

$$DCR_i = \sum_j |S_{ij}^c - S_j|$$

Krugman specialisation index

$$K_{kl} = \sum_i |S_{ik}^s - S_{il}^s|$$

Spatial separation measure

$$SP^i = C \sum_{k=1}^n \sum_{l=1}^n (S_{ik}^c S_{il}^c \delta_{kl})$$

$\delta_{kl}$  is the distance between  $k$  and  $l$ .  $C$  is a constant

**Gini coefficients**

Gini coefficient for regional specialisation

$$GINI_j^s = \frac{2}{n^2 \bar{R}} \left[ \sum_{i=1}^n \lambda_i |R_i - \bar{R}| \right] \text{ where } R_i = \frac{S_{ij}^s}{S_i}, \bar{R} = \frac{1}{n} \sum_{i=1}^n R_i$$

$\lambda_i$  indicates the position of industry  $i$  in the ranking of  $R_i$  in descending order

Gini coefficient for concentration of industries

$$GINI_i^c = \frac{2}{m^2 \bar{C}} \left[ \sum_{j=1}^m \lambda_j |C_j - \bar{C}| \right] \text{ where } C_j = \frac{S_{ij}^c}{S_j}, \bar{C} = \frac{1}{m} \sum_{j=1}^m C_j$$

$\lambda_j$  indicates the position of region  $j$  in the ranking of  $C_j$  in descending order

Source: Adapted from Traistaru and Iara, 2002.

Table CI: Historical sector shares in GDP

Per cent	Agriculture	Manufacturing	Other production <sup>1</sup>	Business services <sup>2</sup>	Other services <sup>3</sup>	Government/ other
<b>UK</b>						
1975	2.58	28.21	11.33	15.71	24.73	17.44
1985	1.90	23.92	15.36	18.80	24.24	15.78
1993	1.88	19.94	9.76	24.54	28.69	15.19
<b>France</b>						
1975	5.60	27.22	10.36	15.95	25.55	15.32
1985	4.07	23.07	8.95	19.23	26.92	17.76
1992	2.93	20.80	8.33	22.83	28.11	17.00
<b>(West) Germany</b>						
1975	2.88	35.40	10.10	4.64 <sup>4</sup>	26.28	14.32
1985	1.80	32.62	9.09	5.66 <sup>4</sup>	29.33	14.09
1993	1.09	27.16	8.32	6.04 <sup>4</sup>	35.67	13.68
<b>Italy</b>						
1975	7.14	27.43	13.59	5.11 <sup>5</sup>	35.48	11.25
1985	4.55	24.61	11.08	4.79 <sup>5</sup>	41.68	13.11
1994	2.94	20.52	11.16	4.99 <sup>5</sup>	46.82	13.57
<b>US</b>						
1975	3.46	22.28	10.07	18.21	31.68	14.30
1985	2.07	19.47	10.78	23.08	31.85	12.75
1993	1.65	17.39	8.08	26.74	33.05	13.09
<b>Japan</b>						
1975	5.28	29.05	11.74	12.93	16.73 <sup>6</sup>	10.05
1985	3.06	28.37	10.98	14.78	20.22 <sup>6</sup>	9.74
1994	2.05	23.49	13.25	17.17	22.21 <sup>6</sup>	9.64

<sup>1</sup> Mining and quarrying; electricity, gas and water; construction.

<sup>2</sup> Financial institutions and insurance; real estate and business services.

<sup>3</sup> Wholesale and retail trade, restaurants and hotels; transport, storage, communications; community, social and personal services.

<sup>4</sup> Financial institutions and insurance only; numbers sum to less than 100 per cent.

<sup>5</sup> Financial institutions and insurance only.

<sup>6</sup> Excludes wholesale and retail trade, restaurants and hotels; numbers sum to less than 100 per cent.

Source: Nickell et al., 2001.

**Table C2: Leading manufacturing sectors by value added, 1999<sup>1</sup>**

	<b>First sector</b>	<b>Second sector</b>	<b>Third sector</b>
Austria	Machinery and equipment	Metal products	Coke, refined petroleum and equipment
Belgium	Chemicals	Food and beverages	Motor vehicles
Denmark <sup>2</sup>	Food and beverages	Machinery and equipment	Chemicals
Finland	Radio, TV and communications equipment	Pulp, paper and paper products	Machinery and equipment
France	Chemicals	Food and beverages	Motor vehicles
Germany	Machinery and equipment	Motor vehicles	Chemicals
Greece <sup>2</sup>	Food and beverages	Chemicals	Non-metallic mineral products
Ireland <sup>2</sup>	Chemicals	Food and beverages	Publishing and printing
Italy	Machinery and equipment	Chemicals	Metal products
Luxembourg	Metals	Rubber and plastics	Non-metallic mineral products
Netherlands	Food and beverages	Chemicals	Publishing and printing
Portugal	Food and beverages	Non-metallic mineral products	Textiles
Spain	Food and beverages	Metal products	Chemicals
Sweden	Motor vehicles	Machinery and equipment	Chemicals
UK	Food and beverages	Chemicals	Machinery and equipment
<b>EU</b>	<b>Chemicals</b>	<b>Machinery and equipment</b>	<b>Food and beverages</b>

<sup>1</sup> 2000 for EU; 1998 for Italy, Austria's third sector and Netherlands second and third sectors; 1997 for Luxembourg and Netherlands first sector.

<sup>2</sup> Classification based on value added for NACE Divisions, net of VAT but not of other taxes on products; these are important in chemicals and food and beverage sectors, and are likely to have inflated the importance of these sectors.

Source: European Commission, Eurostat, 2002.

**Table C3: UK micro-enterprises (less than 10 employees) share in UK private sector, 2002**

<b>Per cent</b>	<b>Enterprises</b>	<b>Employment</b>	<b>Turnover</b>
<b>All industries</b>	<b>95</b>	<b>30</b>	<b>23</b>
Agriculture, forestry, fishing	99	85	81
Mining, quarrying, utilities	86	3	7
Manufacturing	88	15	8
Construction	98	62	43
Wholesale, retail, repairs	93	28	23
Hotels, restaurants	89	29	31
Transport, storage, comms.	9	22	16
Financial intermediation	94	9	n/a
Real estate, business activities	96	43	40
Education	98	54	48
Health, social work	91	17	13
Other services	98	53	40

Source: Small Business Service.

**Table C4: Share of small enterprises (1-49 employees) in sector value added, 1999<sup>1</sup>**

Per cent	Aut	Bel	Den	Fin	Fra	Ire	Ita	Nld	Por	Spa	Swe	UK
Electricity, water, gas supply	5.5	–	–	16.5	2.5	–	4.1	3.2	10.9	5.4	27.4	3.9
Total manufacturing	19.9	20.7	24.2	16.0	23.9	8.7	42.3	25.5	32.6	33.7	17.6	20.0
Food, beverages, tobacco	–	27.8	12.7	18.3	33.8	8.2	45.7	17.2	29.5	32.8	15.4	7.7
Textiles, leather, clothing, footwear	23.8	30.5	41.7	35.5	36.3	–	54.7	42.5	35.0	56.2	–	28.7
Wood, paper, publishing, printing	27.6	40.6	40.6	12.2	39.0	–	49.8	34.0	40.3	48.6	23.4	30.1
Chemicals, rubber, plastics	12.3	9.1	12.8	16.8	12.1	3.4	26.5	12.4	23.8	20.1	12.4	12.6
Elect. machinery, electronics	9.7	12.2	20.8	5.1	15.6	3.9	35.4	16.2	12.2	21.2	10.8	16.7
Transport equipment	3.7	5.8	18.8	16.1	8.4	14.1	10.8	18.9	9.2	6.8	4.6	6.9

<sup>1</sup> Germany, Greece, Luxembourg not available. Some data are for 1998; see source for details.

Source: European Commission, Eurostat, 2002.

Table C5: Comparison of rates of growth of euro area imports before (1996-1998) and after (1999-2001) EMU

NACE	Industry <sup>1</sup>	Share of euro area imports (per cent)	Change relative to:		Annual rates of growth in euro area imports from								
			Imports from non-euro area <sup>2</sup> (percentage points)	Imports from non-euro area W. Europe <sup>3</sup> (percentage points)	Euro area			Non-euro area			Non-euro area Western Europe		
					1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)
341	Manufacture of motor vehicles	8.8	0.11	0.08	0.10	0.08	-0.02	0.19	0.07	-0.13	0.12	0.02	-0.10
343	Parts and accessories for motor vehicles and their engines	3.3	0.06	0.22	0.11	0.08	-0.03	0.18	0.09	-0.09	0.22	-0.02	-0.24
323	Television and radio, sound or video recording apparatus	1.9	0.05	0.22	0.05	0.07	0.03	0.14	0.11	-0.03	0.11	-0.08	-0.19
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	2.1	0.05	0.03	0.03	0.02	-0.01	0.06	0.01	-0.06	0.01	-0.04	-0.04
353	Manufacture of aircraft and spacecraft	4.5	0.04	-0.05	0.22	0.17	-0.05	0.23	0.13	-0.09	0.19	0.19	-0.01
241	Manufacture of basic chemicals	6.4	0.04	0.05	0.05	0.08	0.04	0.06	0.07	0.00	0.06	0.05	-0.01
300	Office machinery and computers	6.4	0.01	0.05	0.16	0.07	-0.09	0.17	0.06	-0.11	0.18	0.05	-0.14
312	Manufacture of electricity distribution and control apparatus	1.1	0.01	0.04	0.08	0.07	-0.01	0.13	0.11	-0.02	0.08	0.02	-0.06
251	Manufacture of rubber products	1.0	0.01	0.08	0.07	0.02	-0.05	0.11	0.06	-0.06	0.08	-0.04	-0.13
152	Processing and preserving of fish and fish products	0.8	0.01	-0.01	0.11	0.07	-0.05	0.11	0.05	-0.06	0.06	0.02	-0.04
252	Manufacture of plastic products	1.9	0.01	0.04	0.06	0.04	-0.02	0.10	0.07	-0.03	0.08	0.02	-0.06
287	Manufacture of other fabricated metal products	1.3	0.00	0.03	0.07	0.04	-0.03	0.11	0.07	-0.03	0.08	0.01	-0.06
273	Other first processing of iron and steel; non-ECSC ferro-alloys	0.5	0.00	0.04	-0.05	0.01	0.06	-0.01	0.04	0.05	-0.01	0.00	0.01
153	Processing and preserving of fruit and vegetables	0.7	0.00	0.01	0.04	0.03	-0.01	0.04	0.03	-0.01	0.06	0.04	-0.02
365	Manufacture of games and toys	0.5	0.00	0.06	0.10	0.08	-0.02	0.09	0.08	-0.02	0.05	-0.03	-0.08
332	Instruments for measuring, checking, testing navigating	1.4	-0.01	0.01	0.09	0.08	-0.02	0.11	0.11	-0.01	0.07	0.04	-0.02
177	Manufacture of knitted and crocheted articles	0.6	-0.01	0.10	0.05	0.02	-0.03	0.13	0.10	-0.02	0.07	-0.07	-0.13
246	Manufacture of other chemical products	1.7	-0.01	-0.05	0.05	0.05	0.01	0.07	0.09	0.02	0.04	0.10	0.05
245	Soap and detergents, cleaning and polishes, perfumes and toiletries	0.8	-0.01	-0.02	0.06	0.07	0.01	0.09	0.11	0.02	0.07	0.10	0.03
274	Manufacture of basic precious and non-ferrous metals	3.2	-0.02	0.02	0.03	0.06	0.03	0.02	0.07	0.05	0.05	0.06	0.01

**Table C5: Comparison of rates of growth of euro area imports before (1996-1998) and after (1999-2001) EMU (continued)**

NACE	Industry <sup>1</sup>	Share of euro area imports (per cent)	Change relative to:		Annual rates of growth in euro area imports from								
			Imports from non-euro area <sup>2</sup>	Imports from non-euro area W. Europe <sup>3</sup>	Euro area			Non-euro area			Non-euro area Western Europe		
			(percentage points)	(percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)
297	Manufacture of domestic appliances not elsewhere classified	0.9	-0.02	0.05	0.05	0.03	-0.02	0.09	0.09	-0.01	0.05	-0.02	-0.07
291	Machinery for mechanical power, except vehicles	2.2	-0.02	0.01	0.08	0.04	-0.04	0.11	0.10	-0.02	0.07	0.02	-0.05
182	Manufacture of other wearing apparel and accessories	3.0	-0.02	0.05	0.06	0.02	-0.04	0.08	0.06	-0.02	0.05	-0.04	-0.08
159	Manufacture of beverages	0.7	-0.02	0.01	0.08	0.04	-0.04	0.09	0.07	-0.01	0.08	0.03	-0.04
294	Manufacture of machine tools	1.0	-0.02	-0.01	0.11	0.05	-0.06	0.12	0.07	-0.04	0.07	0.02	-0.05
295	Manufacture of other special purpose machinery	2.1	-0.02	0.00	0.09	0.03	-0.06	0.10	0.07	-0.04	0.08	0.02	-0.07
155	Manufacture of dairy products	0.9	-0.03	0.01	0.00	0.02	0.02	0.00	0.05	0.04	-0.01	-0.01	0.01
158	Manufacture of other food products	1.2	-0.03	0.00	0.06	0.02	-0.04	0.06	0.05	-0.01	0.07	0.03	-0.04
361	Manufacture of furniture	1.2	-0.03	0.03	0.07	0.03	-0.05	0.13	0.11	-0.02	0.08	0.00	-0.08
175	Manufacture of other textiles	0.5	-0.03	0.00	0.04	0.00	-0.04	0.04	0.03	-0.01	0.04	0.01	-0.04
211	Manufacture of pulp, paper and paper board	2.0	-0.03	0.00	0.00	0.05	0.05	-0.02	0.06	0.08	0.00	0.04	0.04
311	Manufacture of electric motors, generators and transformers	0.9	-0.03	-0.13	0.11	0.03	-0.08	0.16	0.12	-0.05	0.09	0.15	0.05
212	Manufacture of articles of paper and paper board	0.7	-0.03	0.01	0.03	0.06	0.02	0.06	0.12	0.05	0.05	0.06	0.01
244	Pharmaceuticals, medicinal chemicals and botanical products	3.8	-0.03	-0.05	0.17	0.16	-0.01	0.14	0.17	0.03	0.11	0.15	0.04
172	Textile weaving	0.7	-0.04	0.00	0.02	-0.04	-0.06	0.05	0.03	-0.02	-0.01	-0.07	-0.07
292	Manufacture of other general purpose machinery	2.1	-0.04	0.02	0.10	0.05	-0.05	0.12	0.12	-0.01	0.10	0.03	-0.07
193	Manufacture of footwear	1.0	-0.05	-0.05	0.07	0.05	-0.02	0.09	0.12	0.03	-0.02	0.01	0.03
286	Manufacture of cutlery, tools and general hardware	0.8	-0.06	-0.06	0.08	0.04	-0.04	0.09	0.11	0.02	0.07	0.09	0.01
321	Electronic valves and tubes and other electronic components	2.9	-0.07	-0.23	0.12	0.10	-0.02	0.10	0.16	0.06	-0.01	0.20	0.21
261	Manufacture of glass and glass products	0.6	-0.08	-0.05	0.04	0.02	-0.03	0.08	0.13	0.05	0.02	0.04	0.02
331	Medical and surgical equipment and orthopaedic appliances	1.2	-0.08	-0.05	0.11	0.08	-0.03	0.12	0.17	0.05	0.10	0.11	0.02
362	Manufacture of jewellery and related articles	0.6	-0.08	-0.20	0.09	0.07	-0.02	0.06	0.13	0.06	0.02	0.20	0.18

Table C5: Comparison of rates of growth of euro area imports before (1996-1998) and after (1999-2001) EMU (continued)

NACE	Industry <sup>1</sup>	Share of euro area imports (per cent)	Change relative to:		Annual rates of growth in euro area imports from								
			Imports from non-euro area <sup>2</sup>	Imports from non-euro area W. Europe <sup>3</sup>	Euro area			Non-euro area			Non-euro area Western Europe		
			(percentage points)	(percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)	1996-1998 (per cent)	1999-2001 (per cent)	Change (percentage points)
151	Production, processing and preserving of meat and meat products	1.2	-0.08	-0.02	0.04	0.02	-0.02	-0.03	0.03	0.06	-0.07	-0.07	0.00
154	Manufacture of vegetable and animal oils and fats	0.6	-0.09	0.10	0.08	0.01	-0.07	0.05	0.07	0.02	0.11	-0.07	-0.18
334	Manufacture of optical instruments and photographic equipment	0.6	-0.10	-0.08	0.14	0.09	-0.05	0.10	0.15	0.05	0.09	0.12	0.03
316	Manufacture of electrical equipment not elsewhere classified	1.1	-0.11	0.09	0.07	0.02	-0.05	0.07	0.13	0.06	0.15	0.00	-0.14
232	Manufacture of refined petroleum products	2.4	-0.14	-0.05	0.04	0.22	0.18	-0.03	0.30	0.32	-0.03	0.20	0.23
322	Television and radio transmitters and apparatus for line telephony	2.4	-0.17	0.09	0.29	0.19	-0.10	0.21	0.28	0.07	0.31	0.12	-0.19

<sup>1</sup> Industries which account for more than 0.5% of 2001 EU imports (combined share of 2001 imports: 88%).

<sup>2</sup> Basis of ranking.

<sup>3</sup> Denmark, Norway, Sweden, Switzerland and the United Kingdom.

Source: Data provided by the Strategy Unit, DTI from the Comext database.

Table C6: Sector characteristics potentially influencing EMU sensitivity

NACE	Industry	Stocks & work in progress/turnover <sup>1</sup> (per cent)	Advertising expenditure/turnover <sup>2</sup> (per cent)	Small firms' share of turnover <sup>3</sup> (per cent)
151	Meat and meat products	11	0.8	12
152	Fish and fish products	17	0.4	*
153	Fruit and vegetables	17	1.7	10
154	Vegetable and animal oils and fats	13	0.1	*
155	Dairy products	12	1	10
156	Grain mill products, starches and starch products	14	7.5	5
157	Prepared animal feeds	10	3	19
158	Other food products	16	4.1	11
159	Beverages	52	4.3	4
160	Tobacco products	11	3.5	*
171	Preparation and spinning of textile fibres	39	0.2	28
172	Textile weaving	39	0.5	36
174	Made-up textile articles, except apparel	30	1.3	53
175	Other textiles	32	1.5	34
176	Knitted and crocheted fabrics	30	0.2	*
177	Knitted and crocheted articles	40	1.2	*
181	Leather clothes	23	0	*
182	Other wearing apparel and accessories	27	1.3	50
183	Furs	19	0	*
191	Tanning and dressing of leather	23	0.5	*
192	Luggage, handbags and the like, saddlery and harness	33	2	*
193	Footwear	51	1	*
201	Sawmilling and planing of wood	26	0.2	53
202	Veneer, plywood, fibre board and other panels and board	21	0.5	*
203	Builders' carpentry and joinery	17	1.7	75
204	Wooden containers	15	0.2	*
205	Other products of wood; articles of cork and straw	21	0.3	*
211	Pulp, paper and paperboard	21	0.5	*
212	Articles of paper and paperboard	16	0.9	*
221	Publishing	11	4	21
222	Printing and service activities related to printing	8	0.3	*
233	Processing of nuclear fuel	16	0.2	*
241	Basic chemicals	21	0.2	6
242	Pesticides and other agro-chemical products	34	1.5	*
243	Paints, varnishes, printing ink and mastics	24	2.1	17
244	Pharmaceuticals	37	3.1	3
245	Soap and detergents, cleaning and polishes, perfumes and toiletries	20	9.6	11
246	Other chemical products	24	1.3	10
247	Man-made fibres	16	0.7	*
251	Rubber products	22	1.1	22
252	Plastic products	17	0.9	40
261	Glass and glass products	25	0.4	28
262	Non-refractory ceramic goods	33	0.9	27
263	Ceramic tiles and flags	33	1	*
264	Bricks, tiles and construction products, in baked clay	45	1.1	*
265	Cement, lime and plaster	20	0.2	*
266	Articles of concrete, plaster and cement	15	0.6	26
267	Cutting, shaping and finishing of stone	34	1.7	*
268	Other non-metallic mineral products	23	0.7	37
271	Basic iron and steel and ferro-alloys	25	0.1	2
272	Tubes	27	0.4	46
273	Other first processing of iron and steel	26	0.3	37
274	Basic precious and non-ferrous metals	22	0.2	9
281	Structural metal products	17	0.6	45
282	Tanks, reservoirs and central heating	23	1.1	*

Table C6: Sector characteristics potentially influencing EMU sensitivity (continued)

NACE	Industry	Stocks & work in progress/turnover <sup>1</sup> (per cent)	Advertising expenditure/turnover <sup>2</sup> (per cent)	Small firms' share of turnover <sup>3</sup> (per cent)
283	Steam generators	16	0.1	*
286	Cutlery, tools and general hardware	28	0.9	60
287	Other fabricated metal products	21	0.5	52
291	Machinery for mechanical power, except vehicles	36	0.5	18
292	General purpose machinery	21	0.5	40
293	Agricultural and forestry machinery	31	0.7	*
294	Machine tools	32	0.7	37
295	Other special purpose machinery	27	0.6	35
296	Weapons and ammunition	62	0.5	*
297	Domestic appliances not elsewhere classified	22	2.2	16
300	Office machinery and computers	13	0.5	6
311	Electric motors, generators and transformers	33	0.4	27
312	Electricity distribution and control apparatus	27	0.8	19
313	Insulated wire and cable	24	0.2	20
314	Accumulators, primary cells and primary batteries	29	0.6	*
315	Lighting equipment and electric lamps	22	0.8	*
316	Electrical equipment not elsewhere classified	28	0.6	35
321	Electronic components	20	0.3	13
322	TV and radio transmitters and apparatus for line telephony	24	1	3
323	TV and radio, sound or video recording apparatus	21	1.1	7
331	Medical and surgical equipment and orthopaedic appliances	31	0.8	36
332	Instruments for measuring, checking, testing, navigating	34	0.7	23
334	Optical instruments and photographic equipment	36	1.5	36
335	Watches and clocks	26	0.8	*
341	Motor vehicles	23	2	1
342	Bodies for motor vehicles; trailers	23	0.4	32
343	Parts and accessories for motor vehicles and their engines	17	0.2	15
351	Building and repairing of ships and boats	43	0.6	27
352	Railway and tramway locomotives and rolling stock	30	0.1	*
353	Aircraft and spacecraft	58	0.2	4
354	Motorcycles and bicycles	32	1.5	*
355	Other transport equipment nec	17	0	*
361	Furniture	17	1.5	46
362	Jewellery and related articles	54	2.8	*
363	Musical instruments	34	1.2	*
364	Sports goods	29	5.5	*
365	Games and toys	25	1.9	*
366	Miscellaneous manufacturing not elsewhere classified	20	0.7	71
<b>Unweighted Mean</b>		<b>26</b>	<b>1.2</b>	<b>32</b>

\* Figures not specified for reasons of data confidentiality.

<sup>1</sup> Measured as the average of the beginning of the year and end of the year ratios, 2000, for UK industries, derived from the Annual Business Enquiry database.

<sup>2</sup> UK industries, 2000, Annual Business Enquiry database.

<sup>3</sup> UK industries, March 2002, Inter-Departmental Business Register (IDBR). Annual turnover of less than £10 million.

Source: ONS and DTI calculations.

Table C7: Stock of FDI in the EU, 1999

€ billion (Per cent of total national stock)	EU	Aut	Den	Fin	Fra	Ger	Gre	Ire	Ita	Nld	Por	Spa	Swe	UK
Mining, quarrying	21.29 (3.1)	0.26 (1.1)	0.82 (2.3)	–	0.31 (0.2)	0.54 (0.2)	0.94 (6.4)	–	–	3.00 (1.6)	0.09 (0.4)	0.48 (0.4)	–	34.84 (9.7)
Manufacturing	257.44 (37.8)	7.10 (30.5)	3.53 (10.1)	8.25 (49.1)	41.84 (28.3)	45.04 (15.9)	6.95 (47.4)	85.74 (96.0)	41.84 (45.8)	65.55 (35.9)	5.76 (26.2)	49.83 (44.0)	47.18 (64.3)	93.14 (26.0)
Electricity, gas water	11.26 (1.7)	0.03 (0.1)	–	–	-0.23 (-0.2)	0.52 (0.2)	0.00 (0.0)	–	2.19 (2.4)	1.41 (0.8)	0.29 (1.3)	1.18 (1.0)	5.62 (7.8)	15.79 (4.4)
Construction	2.66 (0.4)	0.08 (0.3)	0.33 (0.9)	–	0.19 (0.1)	0.47 (0.2)	0.65 (4.4)	–	–	0.81 (0.4)	0.40 (1.8)	2.34 (2.1)	1.40 (1.9)	0.91 (0.3)
Distributive trades	77.89 (11.4)	5.29 (22.7)	6.73 (19.2)	3.16 (18.8)	12.71 (8.6)	24.95 (8.8)	1.43 (9.8)	–	8.45 (9.3)	31.37 (17.2)	4.45 (20.2)	11.15 (9.9)	8.53 (11.6)	37.55 (10.5)
Hotels, restaurants	8.15 (1.2)	0.20 (0.9)	0.36 (1.0)	–	0.36 (0.2)	0.64 (0.2)	1.26 (8.6)	–	–	1.66 (0.9)	0.49 (2.2)	1.88 (1.7)	–	6.38 (1.8)
Transport, storage communications	24.18 (3.5)	1.44 (6.2)	8.69 (24.8)	0.46 (2.7)	1.35 (0.9)	1.56 (0.5)	3.22 (22.0)	–	3.08 (3.4)	10.13 (5.5)	0.62 (2.8)	2.56 (2.3)	–	75.77 (21.1)
Financial intermediation	147.27 (21.6)	2.23 (9.6)	4.34 (12.4)	4.39 (26.2)	25.73 (17.4)	26.90 (9.5)	0.22 (1.5)	3.61 (4.0)	35.71 (39.1)	47.87 (26.2)	4.33 (19.7)	14.39 (12.7)	3.15 (4.3)	76.72 (21.4)
Real estate, renting, business activities	131.47 (19.3)	6.66 (28.6)	10.20 (29.1)	0.53 (3.2)	65.57 (44.4)	182.22 (64.4)	–	–	–	20.91 (11.4)	5.57 (25.3)	29.33 (25.9)	7.36 (10.0)	17.26 (4.8)

Source: European Commission, Eurostat, 2002.

Table C8: Top 20 cross-border M&amp;As, 1998-2000

	Deal value (US\$ billion)	Acquired company	Host country	Acquiring company	Home country
2000	202.8	Mannesmann AG <i>Telecommunications</i>	Germany	Vodafone AirTouch PLC <i>Telecommunications</i>	UK
1999	60.3	AirTouch Communications Inc. <i>Telecommunications</i>	US	Vodafone Group PLC <i>Telecommunications</i>	UK
1998	48.2	Amoco Corp. <i>Petroleum</i>	US	British Petroleum Co. PLC <i>Petroleum</i>	UK
2000	46.0	Orange PLC-Mannesmann AG <i>Telecommunications</i>	UK	France Télécom SA <i>Telecommunications</i>	France
1998	40.5	Chrysler Corp. <i>Automobile</i>	US	Daimler-Benz AG <i>Automobile</i>	Germany
1999	34.6	Astra AB <i>Pharmaceuticals</i>	Sweden	ZENECA Group PLC <i>Pharmaceuticals</i>	UK
2000	32.6	Orange PLC <i>Telecommunications</i>	UK	Mannesmann AG <i>Telecommunications</i>	Germany
2000	27.2	ARCO <i>Petroleum</i>	US	BP Amoco PLC <i>Petroleum</i>	UK
2000	25.1	Bestfoods <i>Food and kindred products</i>	US	Unilever PLC <i>Food and kindred products</i>	UK
1999	21.9	Hoechst AG <i>Chemicals</i>	Germany	Rhône-Poulenc SA <i>Chemicals</i>	France
2000	19.4	Allied Zurich PLC <i>Insurance</i>	UK	Zurich Allied AG <i>Insurance</i>	Switzerland
1998	18.4	BAT Industries PLC-Financial <i>Insurance</i>	UK	Zurich Versicherungs GmbH <i>Insurance</i>	Switzerland
2000	14.8	Airtel SA <i>Telecommunications</i>	Spain	Vodafone AirTouch PLC <i>Telecommunication</i>	UK
1999	13.6	One 2 One <i>Telecommunications</i>	UK	Deutsche Telekom AG <i>Telecommunications</i>	Germany
1999	13.2	YPF SA <i>Petroleum</i>	Argentina	Repsol SA <i>Petroleum</i>	Spain
1999	12.6	PacifiCorp <i>Electric and gas utility</i>	US	Scottish Power PLC <i>Electric and gas utility</i>	UK
2000	11.8	Ernst and Young Consulting <i>Consulting service</i>	US	Cap Gemini SA <i>Consulting service</i>	France
2000	11.1	Crédit Commercial de France <i>Banks</i>	France	HSBC Holding PLC <i>Banks</i>	UK
2000	11.0	CWC Consumer Co. <i>Telecommunications</i>	UK	NTL Inc. <i>Media (radio and TV)</i>	US
1998	10.9	Energy Group PLC <i>Electric and gas distribution</i>	UK	Texas Utilities Co. <i>Electric and gas distribution</i>	US

Source: Thomson Financial and OECD, 2001a.

**Table C9: European inward M&A by region/country of investor**

US\$ billion	Europe	North America	Asia/Pacific	Total	France	UK	Germany
1990	45.2	11.7	8.6	<b>68.5</b>	11.7	5.9	5.6
1991	24.4	11.3	4.0	<b>40.7</b>	7.2	4.8	2.0
1992	36.3	8.1	1.1	<b>49.9</b>	8.9	8.6	2.7
1993	25.1	13.2	1.5	<b>41.3</b>	5.8	8.7	3.9
1994	39.0	17.8	1.6	<b>59.8</b>	4.8	10.2	6.1
1995	53.0	27.2	2.7	<b>85.9</b>	10.0	9.2	12.1
1996	48.0	37.3	8.7	<b>96.5</b>	8.6	6.3	5.6
1997	83.9	44.1	6.3	<b>139.4</b>	14.1	24.8	9.8
1998	137.4	77.6	9.8	<b>229.5</b>	25.9	19.8	16.0
1999	282.2	83.9	14.7	<b>390.1</b>	70.3	62.5	69.7
<b>Total</b>	<b>777.5</b>	<b>332.1</b>	<b>39.0</b>	<b>1201.6</b>	<b>167.2</b>	<b>160.9</b>	<b>133.4</b>

Source: OECD, 2001a.

**Table C10: European outward M&A by region of destination**

US\$ billion	Europe	North America	Asia/Pacific	Latin America	Total
1990	45.3	41.9	2.6	6.8	<b>93.3</b>
1991	24.4	16.9	1.3	0.6	<b>43.9</b>
1992	36.3	10.8	2.2	1.3	<b>51.0</b>
1993	25.1	14.5	3.0	1.0	<b>42.6</b>
1994	39.0	38.7	1.7	2.8	<b>76.9</b>
1995	53.9	38.1	12.4	2.1	<b>93.4</b>
1996	48.0	53.4	12.6	6.1	<b>112.0</b>
1997	83.9	55.4	5.7	18.0	<b>158.1</b>
1998	137.4	171.9	12.4	32.6	<b>352.1</b>
1999	282.2	203.5	24.0	34.0	<b>553.0</b>
<b>Total</b>	<b>777.5</b>	<b>645.1</b>	<b>77.7</b>	<b>105.5</b>	<b>1576.2</b>

Source: OECD, 2001a.

Table CI I: US FDI positions (historic-cost basis)

US\$ billion	1997	1998	1999	2000	2001
Austria	2,646	3,856	3,669	2,686	3,374
Belgium	17,337	17,899	20,111	19,527	20,392
Finland	1,311	1,628	1,269	1,110	1,143
France	36,630	42,328	39,960	38,752	38,457
Germany	40,726	47,685	48,445	50,963	61,437
Greece	634	648	587	637	648
Ireland	11,339	21,825	25,946	33,816	34,499
Italy	15,547	15,548	17,321	22,392	23,893
Luxembourg	10,258	14,571	19,776	25,571	30,039
Netherlands	68,619	89,978	110,321	117,557	131,884
Portugal	1,399	1,360	1,915	1,888	1,924
Spain	11,541	14,221	18,632	19,846	19,421
<b>Euro area total<sup>1</sup></b>	<b>217,987</b>	<b>271,547</b>	<b>307,952</b>	<b>334,745</b>	<b>367,111</b>
Denmark	2,385	2,764	3,413	5,363	6,537
Sweden	3,542	5,237	9,855	22,676	17,968
UK	154,462	183,035	228,574	241,663	249,201
<b>EU total</b>	<b>378,376</b>	<b>462,583</b>	<b>549,794</b>	<b>604,447</b>	<b>640,817</b>
Rest of Europe	46,763	55,850	62,164	75,010	84,976
Canada	96,626	98,200	111,747	128,814	139,031
Latin America	180,818	196,755	237,748	251,863	269,556
Asia/Pacific	144,815	159,678	184,313	205,317	216,501
Other	23,918	27,637	27,356	27,980	30,793
<b>World total</b>	<b>871,316</b>	<b>1,000,703</b>	<b>1,173,122</b>	<b>1,293,431</b>	<b>1,381,674</b>

<sup>1</sup> Including Greece for all years.

Source: Bureau of Economic Analysis, 2002

Table C12: US FDI stock by sector in the world, the EU and the UK (historic-cost basis)

US\$ billion	Total Industry	Petroleum	Total Manuf'g	Food	Chemical	Primary fabricated metals	Mach'y and equip.	Elect. equip.	Transp't equip.	Other manuf'g	Wholesale Trade	Deposit'y Inst'ns	Finance Ins, real estate	Other services	Other industry
<b>Total</b>															
2001	1381.7	102.1	376.3	35.5	108.7	21.5	52.4	48.4	39.1	70.7	92.8	49.3	572.5	86.5	102.2
2000	1293.4	95.8	353.6	35.9	100.9	18.8	41.2	49.1	40.1	67.7	83.7	38.1	542.6	80.1	99.5
1999	1173.1	90.5	306.2	34.2	81.7	18.3	35.3	37.0	36.1	63.6	74.2	38.4	498.5	72.1	93.4
1998	1000.7	91.3	290.1	35.3	79.5	18.4	30.9	32.1	33.9	60.1	68.7	40.0	375.4	59.2	76.1
<b>EU</b>															
2001	640.8	22.7	195.6	17.6	72.6	10.5	30.9	20.0	10.6	33.4	35.1	20.9	274.8	48.0	43.8
2000	604.5	24.5	176.7	16.3	66.1	9.0	22.2	29.8	12.9	30.5	33.2	20.2	261.6	44.4	43.9
1999	549.8	26.3	147.9	15.3	48.1	9.9	18.4	13.8	13.5	28.9	32.4	20.5	244.7	39.0	39.0
1998	462.6	28.0	141.3	15.0	47.5	10.7	16.8	11.5	13.1	26.8	30.9	19.3	181.6	34.3	27.2
<b>UK</b>															
2001	249.2	11.9	55.4	6.2	16.4	2.5	12.0	3.0	3.0	12.3	8.0	13.3	110.2	17.8	33.7
2000	241.7	15.6	49.8	6.3	15.0	2.3	8.8	3.8	3.4	10.3	8.3	12.3	105.2	16.1	34.2
1999	228.6	17.5	49.1	5.8	15.5	2.4	9.0	3.6	3.4	9.4	7.5	11.1	98.8	14.8	29.8
1998	183.0	18.4	42.4	4.9	16.2	1.9	7.3	3.6	1.1	7.3	7.2	10.7	72.4	12.2	19.7

Source: Bureau of Economic Analysis.

Table C13: US FDI stock by sector and EU Member State (historic-cost basis)

US\$ billion	Total Industry	Petroleum	Total Manuf'g	Food	Chemical	Primary/fabricated metals	Mach'y and equip.	Elect. equip.	Transp't equip.	Other manuf'g	Wholesale Trade	Deposit'y Inst'ns	Finance Ins, real estate	Other services	Other industry
<b>Austria</b>															
2001	3.4	*	1.7	0.0	0.1	*	0.1	0.5	0.3	*	0.7	0.3	0.4	0.3	*
2000	2.7	*	1.2	0.0	0.1	*	0.1	0.4	0.3	*	0.6	0.3	0.3	0.2	*
1999	3.7	0.1	0.9	0.0	0.1	0.0	0.1	0.4	0.1	0.2	0.6	*	0.1	*	-0.1
1998	3.9	0.2	1.1	0.0	0.0	0.0	0.1	0.4	0.3	0.2	0.5	*	*	0.2	0.0
<b>Belgium</b>															
2001	20.4	0.0	7.1	1.2	4.5	0.2	0.1	0.1	0.3	0.8	2.1	0.6	7.8	3.0	-0.1
2000	19.5	0.0	7.5	1.0	4.8	0.1	0.1	0.3	0.3	1.0	1.8	0.5	7.3	2.5	-0.2
1999	20.1	0.1	7.7	1.0	4.5	0.1	0.2	0.3	0.3	1.3	3.0	0.4	6.8	2.3	-0.2
1998	17.9	0.1	8.6	1.2	5.4	0.1	0.3	0.3	0.5	0.9	2.5	0.3	4.7	1.6	0.0
<b>Denmark</b>															
2001	6.5	0.9	2.1	0.1	0.1	0.0	*	0.5	*	0.3	1.9	0.0	*	0.1	*
2000	5.4	1.1	2.0	0.1	0.1	0.0	*	0.3	0.0	*	0.7	0.0	*	0.1	*
1999	3.4	0.9	0.8	0.0	*	*	*	0.3	0.0	0.3	*	0.0	0.7	0.1	*
1998	2.8	0.6	0.5	0.0	0.1	0.1	*	0.2	0.0	*	*	0.0	0.9	0.2	*
<b>Finland</b>															
2001	1.1	0.0	0.7	0.0	0.4	0.1	0.1	0.1	0.0	0.0	0.3	0.0	*	0.1	*
2000	1.1	0.0	0.7	0.0	0.3	*	0.1	0.1	0.1	*	0.7	0.0	*	0.1	*
1999	1.3	*	0.5	0.0	0.4	*	0.0	0.0	0.0	*	0.4	0.0	*	0.1	0.1
1998	1.6	0.0	1.0	0.0	0.3	*	0.0	*	*	0.1	0.3	0.0	*	0.1	*
<b>France</b>															
2001	38.5	*	16.2	3.4	2.6	3.8	1.2	2.5	0.7	2.0	2.6	2.7	8.4	5.2	*
2000	38.8	*	16.1	3.1	2.9	3.7	1.0	2.3	0.7	2.3	2.6	3.0	9.4	5.0	*
1999	40.0	*	16.3	2.9	4.0	4.0	1.0	1.0	0.8	2.5	2.8	2.9	9.4	5.2	*
1998	42.3	1.1	19.7	3.5	4.2	4.4	2.6	1.0	1.0	3.1	2.7	1.7	9.8	5.2	2.2
<b>Germany</b>															
2001	61.4	2.4	34.5	0.6	10.0	2.6	10.1	2.4	4.8	4.0	2.6	0.2	14.4	4.1	3.2
2000	51.0	1.5	24.1	0.6	3.5	1.2	5.9	2.5	6.1	4.2	3.5	0.3	14.8	3.6	3.2
1999	48.5	1.4	22.5	0.5	3.5	1.5	4.5	1.8	6.8	3.9	3.3	0.7	14.8	2.2	3.7
1998	47.7	3.2	22.8	1.0	3.0	2.0	4.1	1.3	7.2	4.1	3.1	1.1	12.4	2.0	3.1
<b>Greece</b>															
2001	0.7	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0
2000	0.6	*	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	*	0.0	0.0
1999	0.6	*	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	*	*	0.0
1998	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	*	0.1	*

**Table CI3: US FDI stock by sector and EU Member State (historic-cost basis) (continued)**

US\$ billion	Total Industry	Petroleum	Total Manuf'g	Food	Chemical	Primary/fabricated metals	Mach'y and equip.	Elect. equip.	Transp't equip.	Other manuf'g	Wholesale Trade	Deposit'y Inst'ns	Finance Ins, real estate	Other services	Other industry
<b>Ireland</b>															
2001	34.5	*	10.5	0.5	3.8	0.1	1.0	0.9	0.0	4.1	0.9	0.0	12.7	9.9	*
2000	33.8	*	8.8	0.4	3.4	0.1	0.7	0.7	0.0	3.4	0.8	-0.1	14.3	8.8	*
1999	26.0	*	7.5	0.6	2.8	0.1	0.4	0.7	0.0	2.8	0.5	0.0	10.0	7.3	*
1998	21.8	*	8.0	0.6	3.1	0.2	0.2	1.2	0.0	2.7	0.3	0.0	7.6	5.4	*
<b>Italy</b>															
2001	23.9	*	13.1	1.2	2.8	0.2	1.3	4.7	0.7	2.2	2.2	0.4	3.3	2.5	*
2000	22.4	*	12.3	1.1	2.5	0.1	1.1	4.7	0.8	2.1	2.4	0.3	2.8	2.5	*
1999	17.3	*	8.1	1.0	2.3	0.1	0.9	1.2	0.7	1.9	2.6	0.2	2.3	2.4	*
1998	15.6	*	8.1	0.8	3.0	0.1	1.0	0.7	0.6	1.9	2.6	0.3	0.9	2.3	*
<b>Luxembourg</b>															
2001	30.0	0.1	2.6	0.0	*	*	0.0	0.0	0.0	*	1.3	0.4	24.5	0.2	0.0
2000	25.6	0.1	3.4	0.0	*	*	0.0	0.0	0.0	*	1.1	0.3	20.6	0.1	0.0
1999	19.8	*	3.6	0.0	*	*	0.0	0.0	0.0	*	*	0.3	15.1	0.0	0.0
1998	14.6	*	2.6	0.0	0.0	*	0.0	0.0	0.0	*	*	0.3	11.2	0.0	0.0
<b>Netherlands</b>															
2001	131.9	4.3	34.7	3.1	22.5	-0.1	3.8	3.2	0.0	2.3	10.4	*	76.3	3.7	*
2000	117.6	3.1	29.5	2.7	19.1	0.0	2.9	2.6	0.0	2.2	8.7	*	71.3	3.0	*
1999	110.3	3.2	21.7	2.3	12.1	0.3	1.9	3.2	0.1	1.8	8.4	*	73.1	2.5	*
1998	90.0	2.7	15.9	1.1	10.5	0.4	0.9	1.0	0.3	1.7	6.9	*	59.4	3.3	*
<b>Portugal</b>															
2001	1.9	*	0.6	0.1	0.1	0.0	*	0.3	0.1	*	0.4	0.1	0.3	0.4	*
2000	1.9	*	0.5	0.1	0.1	0.0	*	0.3	0.1	*	0.3	0.1	0.3	0.5	*
1999	1.9	*	0.5	0.1	0.1	0.0	*	0.2	0.1	*	0.3	*	0.2	0.5	0.2
1998	1.4	*	0.3	0.1	0.1	0.0	*	*	0.0	0.0	0.4	*	0.3	0.1	*
<b>Spain</b>															
2001	19.4	*	6.6	1.0	1.6	1.3	-0.1	1.0	0.9	1.0	1.2	2.3	8.5	0.6	*
2000	19.9	*	0.5	0.1	0.1	0.0	*	0.3	0.1	*	0.3	0.1	0.3	0.5	*
1999	18.6	0.1	7.1	1.1	1.5	1.3	0.1	1.0	1.2	1.0	1.3	2.2	7.1	0.5	0.4
1998	14.2	0.2	8.7	1.7	1.4	1.4	0.2	1.0	2.2	1.0	1.8	2.1	0.5	0.6	0.4
<b>Sweden</b>															
2001	18.0	0.1	8.7	0.2	*	0.2	0.2	1.0	*	*	0.4	*	6.6	1.3	*
2000	22.7	0.1	14.0	0.0	*	0.0	0.3	0.9	0.1	*	0.4	*	6.0	1.3	*
1999	9.9	0.1	1.6	0.0	0.3	0.0	0.2	0.1	0.1	0.9	0.6	*	5.9	0.9	*
1998	5.2	*	1.7	0.0	0.2	0.0	0.2	0.1	*	*	0.4	*	1.3	1.1	0.3

Table C13: US FDI stock by sector and EU Member State (historic-cost basis) (continued)

US\$ billion	Total Industry	Petroleum	Total Manuf'g	Food	Chemical	Primary/fabricated metals	Mach'y and equip.	Elect. equip.	Transp't equip.	Other manuf'g	Wholesale Trade	Deposit'y Inst'ns	Finance Ins, real estate	Other services	Other industry
<b>UK</b>															
2001	249.2	11.9	55.4	6.2	16.4	2.5	12.0	3.0	3.0	12.3	8.0	13.3	110.2	16.8	33.7
2000	241.7	15.6	49.8	6.3	15.0	2.3	8.8	3.8	3.4	10.3	8.3	12.3	105.2	16.1	34.2
1999	228.6	17.5	49.1	5.8	15.5	2.4	9.0	3.6	3.4	9.4	7.5	11.1	98.8	14.8	29.8
1998	183.0	18.4	42.4	4.9	16.2	1.9	7.3	3.6	1.1	7.3	7.2	10.7	72.4	12.2	19.7

\* Figures not specified for reasons of data confidentiality.

Source: Bureau of Economic Analysis.

**Table CI4: Gini coefficients of specialisation, US and EU**

	1970-1973	1980-1983	1988-1991	1994-1997
US average	0.450	0.413	0.391	0.372
EU average	0.248	0.234	0.249	0.261

Source: Midelfart-Knarvik et al., 2000.

**Table CI5: Sector structure implications: sensitivity to interest rate changes**

1 = least sensitive, 3 = most sensitive	Production		Value added		Exports	
	1992-95	1996-98	1992-95	1996-98	1992-95	1996-98
France	1.81	1.82	1.81	1.82	1.92	1.93
Germany	1.96	2.01	1.98	2.02	2.10	2.12
Italy	1.79	1.82	1.80	1.83	1.94	1.96
UK	1.80	1.82	1.81	1.83	1.86	1.86
'EU4'	1.86	1.89	1.88	1.90	1.98	2.00

Source: DTI, new version of OECD STAN.

**Table CI6: Sector structure implications: sensitivity to cost changes**

1 = least sensitive 3 = most sensitive	Production		Value added		Exports	
	1992-95	1996-98	1992-95	1996-98	1992-95	1996-98
France	1.67	1.65	1.70	1.68	1.75	1.75
Germany	1.69	1.66	1.69	1.66	1.70	1.68
Italy	1.86	1.85	1.86	1.85	1.97	1.94
UK	1.64	1.65	1.61	1.61	1.79	1.82
'EU4'	1.71	1.70	1.71	1.69	1.77	1.77

Source: DTI, new version of OECD STAN.

Table C17: Most agglomerated UK regions, by postcode, 1992

4-digit industry	1st postcode area	2nd postcode area	Total number of firms	Per cent of firms in 1st (2nd) postcode	Per cent of emp. in 1st (2nd) postcode	Average firm emp. in 1st (other) postcode
Spinning, weaving	N. Ireland	*	26	57.7 (*)	86.3 (*)	134 (29)
Jute, polypropylene	Dundee	*	31	32.3 (*)	67.6 (*)	204 (47)
Ceramic goods	Stoke-on-Trent	Derby	744	31.3 (3.0)	66.0 (4.1)	120 (28)
Lace	Nottingham	Derby	86	60.5 (11.6)	63.8 (14.2)	36 (31)
Cutlery	Sheffield	*	75	68.0 (*)	58.2 (*)	39 (60)
Pedal cycles	*	Birmingham	73	* (19.2)	* (17.7)	* (21)
Hosiery	Leicester	Nottingham	1341	39.7 (6.0)	38.2 (17.9)	40 (43)
Jewellery	Birmingham	London	1916	18.4 (25.5)	33.7 (21.3)	11 (5)
Handtools	Sheffield	Walsall	324	18.8 (2.8)	40.7 (7.7)	51 (17)
Periodicals	London	Tunbridge Wells	2079	29.7 (3.0)	38.4 (3.1)	26 (18)
Woollens and worsted	Bradford	Huddersfield	508	17.7 (16.3)	28.8 (17.3)	95 (50)
Caravans	Hull	Bournemouth	85	18.8 (5.9)	37.1 (9.3)	148 (54)
Wall coverings	Blackburn	*	33	27.3 (*)	40.1 (*)	166 (93)
Weaving cotton, silk	Blackburn	Oldham	267	14.6 (6.0)	32.8 (13.0)	111 (39)
Other steel forming	Birmingham	Sheffield	58	22.4 (10.3)	21.6 (19.2)	74 (78)
Spirit distilling	Glasgow	Edinburgh	95	13.7 (8.4)	30.8 (12.3)	290 (103)
Hats	Luton	*	126	23.8 (*)	29.2 (*)	26 (20)
Fish processing	Doncaster	Aberdeen	290	4.5 (14.8)	29.3 (14.8)	502 (57)

\* Figures not specified for reasons of data confidentiality.  
Source: Devereux et al., 2002.