

# 4

## MACROECONOMIC BENEFITS OF MONETARY UNION IN THE US

**The impact of monetary union on stability in the US is difficult to identify in the absence of a counterfactual which would show how stable US regions would have been if monetary union had never existed.**

**The evidence suggests that US output volatility has declined through the second half of the 20th century, particularly over the last 20 years.**

**US consumption has been more stable than in other major industrialised countries over the past twenty years, and more stable than output. The large and integrated financial market in the US may have helped firms and households to smooth consumption in the face of shocks to output.**

**4.1** Having analysed adjustment and the costs associated with it, the remainder of this study considers the potential benefits to the US economy of monetary union, in terms of both macroeconomic and microeconomic factors.

**4.2** Recent research on monetary unions considers whether they promote macroeconomic stability. There are three principal ways in which this might occur:

- first, it has been argued that an independent exchange rate is primarily a source of shocks to the economy, rather than a stabilisation mechanism (as is assumed in traditional optimal currency area theory). Extending this argument to the US, if each US state had an independent exchange rate there might be a significant increase in economic volatility within the US. With a single currency this potential source of instability is removed, and the large size of the US internal market means that most of the domestic economy is shielded from US dollar instability;<sup>1</sup>
- second, a large and integrated financial market may allow firms and households to smooth consumption more effectively in the face of shocks to income. Section 3 considered the evidence on inter-regional and longer-term risk sharing in the US; and
- third, monetary union could lead to gains in monetary policy credibility. However, as Escolano (2000) points out, these gains are not necessarily associated with joining a monetary union, but are related to the good conduct of policy.

**4.3** This section first examines US macroeconomic performance over the past 70 years; and then considers whether monetary union has influenced US macroeconomic performance, focusing on the impact on stability.

<sup>1</sup> For example, Layard et al. (2002, page 9) argue that "... the US, with only about 10 per cent of its output traded outside its borders, is able to follow a policy of close to benign neglect towards the external value of its currency, the dollar, without major effects on its own economy. But for a trading nation like Britain, exporting about 28 per cent of GDP these [exchange rate] shocks matter".

## Developments in US macroeconomic performance

**4.4** The evidence from studies examining the evolution of macroeconomic stability in the US over the last 70 years is that increasing stability in the US business cycle is a long-term phenomenon.

**20th century developments** **4.5** In a seminal paper, Burns (1960) highlights five main factors contributing to the US business cycle becoming more stable in the years following the Great Depression:

- first, prior to the 1920s, the industrialisation of the US economy meant that a greater share of employment was subject to fluctuations in the business cycle. From 1920, this trend appeared to halt, and indeed reverse, as the number of ‘white-collar’ occupations increased as a proportion of total employment. Burns notes the US recession of 1957-1958, when ‘blue-collar’ employment declined by around 12 per cent, compared with a decline of only 3 per cent in ‘white-collar’ posts;
- second, the relative expansion of corporate, rather than individual, enterprise helped to act as a buffer between variations in production and the flows of income to individuals – because dividends tended to be less volatile than corporate profits. And as business improved inventory management techniques, another source of instability was reduced – by holding lower inventory-sales ratios there was less scope for firms to scale back production in the event of a downturn and rely on inventories to satisfy an already dwindling demand;
- third, the strengthening of financial systems throughout the early part of the 20th century helped to limit fear of contagion and propagation of crises. In so far as monetary union promoted integration of financial markets (for more details see Section 5 on financial markets) this suggests a role for the monetary union in helping to improve stability. However, institutional reform and developments largely unconnected to monetary union were also important for strengthening the financial sector;
- fourth, running alongside these developments was an emerging political consensus in the 1930s that mass unemployment was unacceptable, and that the business cycle should not be left to run a free course. Improvements in the conduct of monetary policy were complementary, with long-term interest rates becoming more responsive to downturns in activity and the Federal Reserve making use of open-market operations to influence credit conditions counter-cyclically; and
- fifth, the expanding role of the public sector may have helped to reduce macroeconomic volatility. Personal and corporate income taxes gradually became the most significant portion of federal revenues, and tended to be more responsive to changes in the overall level of economic activity than revenues that had previously been dominated by taxes on estates, gifts, employment and sales. Together with the development of unemployment insurance benefits (established on a national basis in 1935), this has allowed the role of the automatic stabilisers in the economy to develop (further detail on fiscal stabilisation is provided in Section 3).

**4.6** DeLong and Summers (1984) also find evidence that the US economy has become progressively more stable. They emphasise:

- the role of the larger and more progressive tax system in dampening fluctuations in income, and note that growth in the availability of consumer credit reduced the number of consumers who would otherwise have had to cut consumption in response to income changes; and
- the increasing institutionalisation of the economy might have contributed to stability. In the pre-War period, there were few long-term labour market contracts and relatively little unionisation. The period immediately before and after the War saw dramatic increases in union membership and a fall in the share of the working population who were self-employed. Longer-term contracts and attachments between workers and firms might have slowed the response of employment (and therefore personal income) to changes in demand.

### Recent developments in US macroeconomic stability

**4.7** Recent debate has centred on whether the volatility of the US economy has fallen further in the last 20 years. Two sustained periods of strong economic growth since the early 1980s have focused attention on the resilience and stability of the US economy. In February 2002, for example, Federal Reserve Chairman Alan Greenspan used his testimony to Congress<sup>2</sup> to discuss a range of developments in the US economy and their potential impact on economic stability. Chairman Greenspan saw potentially positive influences on stability from improved information, greater flexibility, financial regulation and the increased role of conceptual value. But he emphasised that these developments also posed risks to stability.

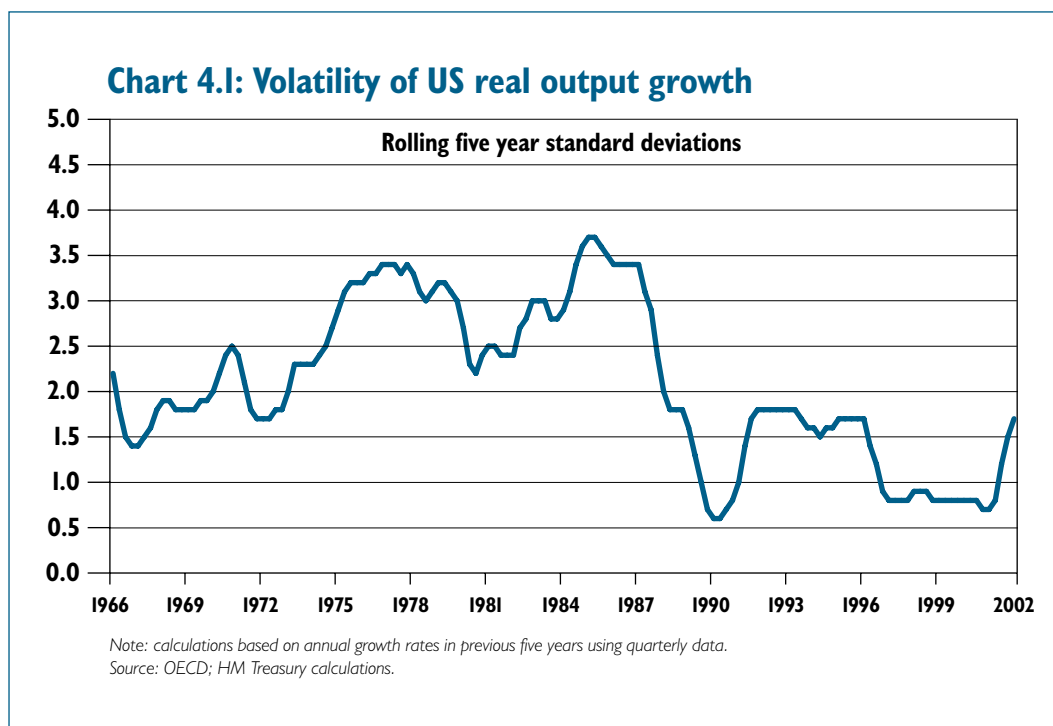
**4.8** Chart 4.1 indicates that output volatility in the 1990s has been consistently lower than in the previous three decades. Blanchard and Simon (2000) argue that the two long expansions in US output since the early 1980s are the result of a decline in output volatility that has been evident to a greater or lesser degree since the 1950s. Their analysis suggests that the decline in volatility has several causes – including decreased volatility of government spending from the 1950s onwards, lower volatility in consumption and, to a lesser extent, investment.

**4.9** In contrast, McConnell and Perez-Quiros (1998) and others<sup>3</sup> argue that, rather than there having been a gradual decline in volatility over the period since the 1950s, there was a rapid decrease in volatility in the first half of the 1980s.

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<sup>2</sup> Alan Greenspan: The Semi-annual Monetary Policy Report to Congress, 27 February 2002.

<sup>3</sup> Chauvet and Potter (2001), Romer (1999) and Taylor (2000).



**Causes of the recent decline in volatility**

**4.10** There is less agreement over the causes of this decline in volatility, though two factors stand out – an improvement in the conduct of monetary policy and changes to inventory management.

**Inventory management?**

**4.11** Since the mid 1990s, newer inventory management techniques, such as ‘just in time’ and a shift towards less inventory-intensive industries, may have led to inventory investment becoming counter-cyclical, reducing the volatility of output relative to sales.

**Monetary policy improvements?**

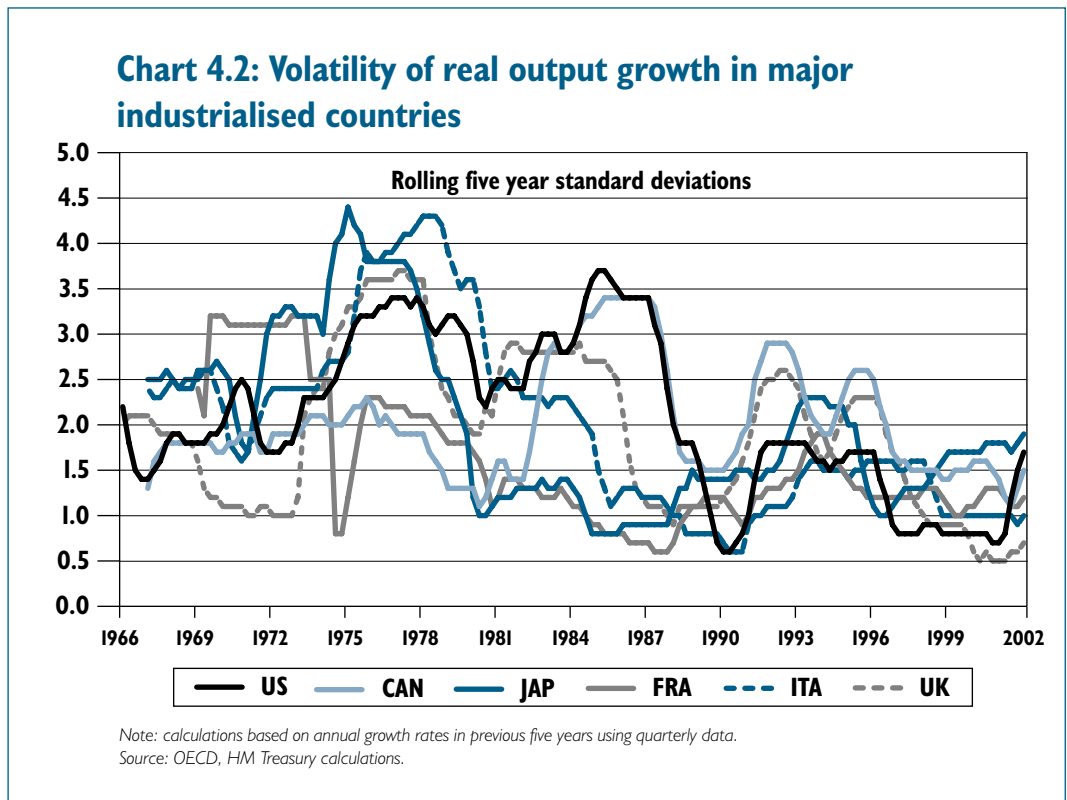
**4.12** Taylor (2000) argues that the reduction in volatility is a result of less volatile consumption patterns, due to improvements in the conduct of monetary policy. He points out that the Federal Reserve has become more reactive to inflation and to changes in real output. Clarida *et al.* (1998) argue that in the Volcker/Greenspan<sup>4</sup> period, the Federal Reserve has adopted a more proactive stance in seeking to control inflation.

**4.13** The methodological problems with identifying shocks and their impact on the economy make it difficult to settle the argument between those who find evidence that the decline in volatility reflects an improvement in the conduct of policy and those who believe that it reflects the fact that the period has been relatively shock-less. In addition, it must also be borne in mind that, even if the economy is currently more stable, volatility may increase once again. Romer (1999) points out that Burns’ finding of a more stable US macroeconomy in the 1950s ultimately turned out to be fleeting.

<sup>4</sup> Chairmen of the Federal Reserve Board of Governors: Paul Volcker 1979-1987; Alan Greenspan 1987 to date.

## The impact of monetary union on macroeconomic stability in the US

**Relative output stability** 4.14 It is difficult to gauge the impact of monetary union on macroeconomic stability in the US as there is no appropriate counterfactual. However, one approach is to compare the performance of the US economy against that of other major industrialised economies. Chart 4.2 shows the volatility of output growth in the US and selected other G7 economies on a rolling five-year basis. There was a high degree of output instability in the US during much of the 1970s and 1980s followed by an improvement from the mid 1980s. The second half of the 1990s has seen low output volatility in the US, but this is also true of most other countries in Chart 4.2.

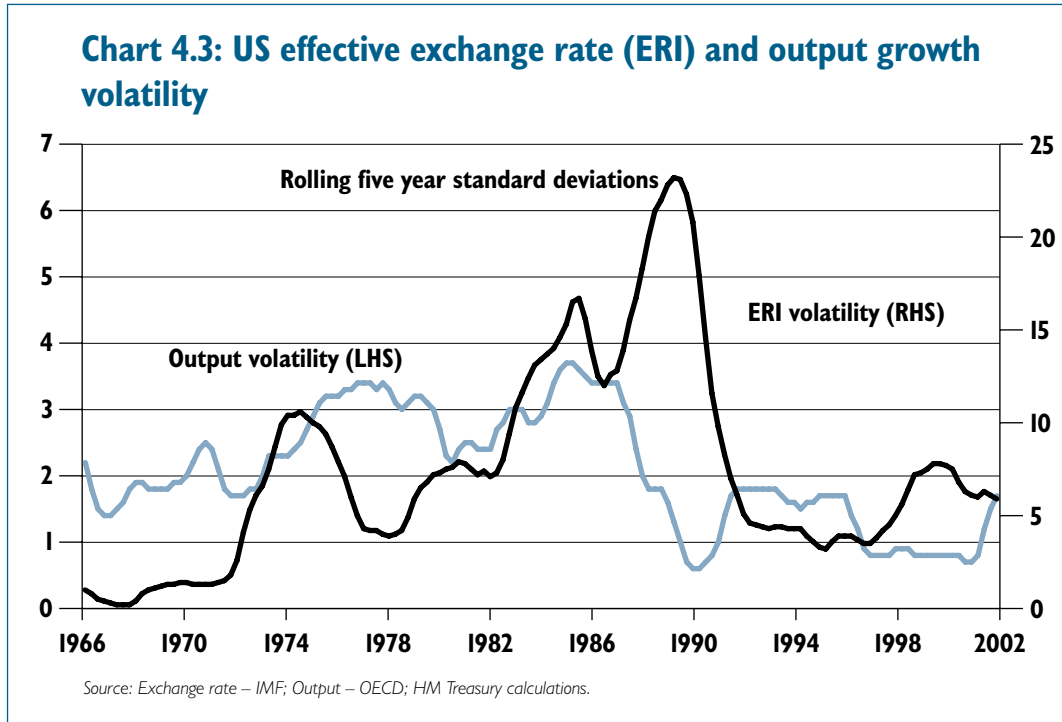


**The impact of monetary policy on stability** 4.15 One explanation for increasing output stability in the US is an improvement in the operation of monetary policy. However, there is no direct causality between the existence of monetary union and effective monetary policy. That is not to say that the two cannot be linked but, as already noted, improvements in the conduct of policy can arise without joining a monetary union. In the US example, the evidence suggests that institutional factors have largely been responsible for the improvement in stability, as they have for other countries.

**Impact of the dollar exchange rate on stability** 4.16 Large monetary unions might also gain macroeconomic stability because the economy is less exposed to external developments and to exchange rate volatility. International exports account for around 12 per cent of US GDP, compared to around 32 per cent for the UK.<sup>5</sup>

<sup>5</sup> OECD data, ratio of exports of goods and services to GDP at market prices, 2000.

**4.17** Chart 4.3 compares the volatility of the effective dollar exchange rate (ERI) against output. In the early 1970s, there was an increase both in output and exchange rate volatility; despite its relatively low external exposure, US output volatility may have been affected by the exchange rate. However, it is not possible to attribute causality on the basis of this chart – it may be that output volatility is driving exchange rate volatility. And by contrast, the late 1980s saw a sharp increase in exchange rate volatility corresponding with a decline in output volatility.

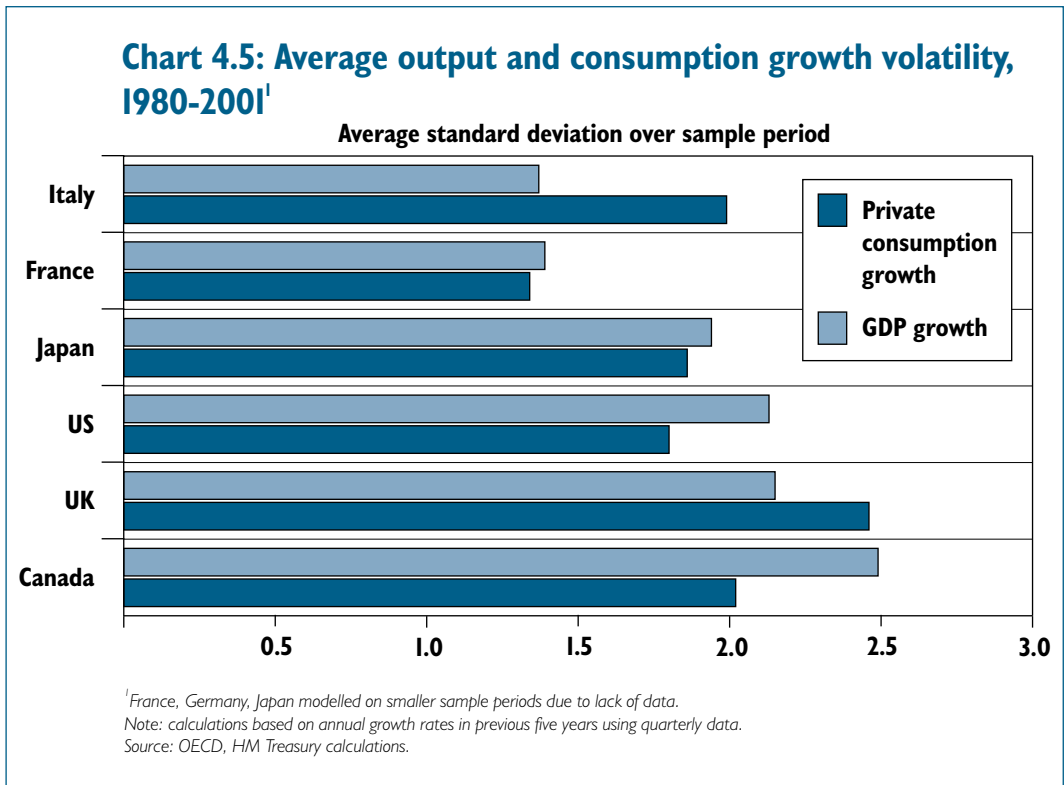
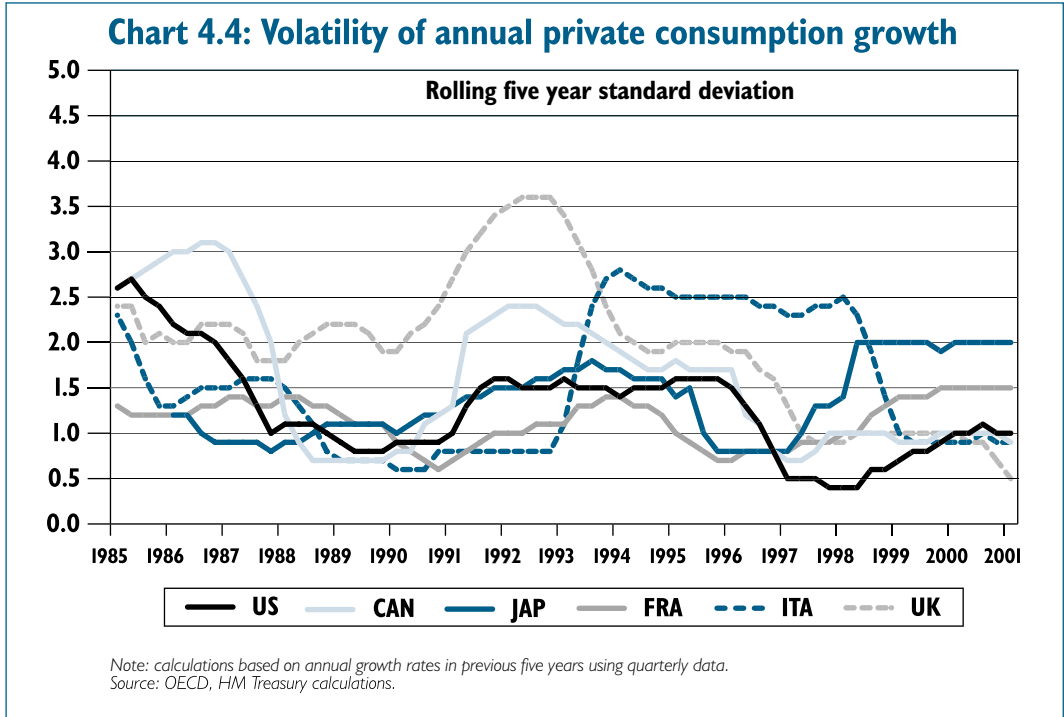


#### The stability of consumption

**4.18** A final explanation for why monetary union may have benefited US macroeconomic stability is that its large integrated financial market allows firms and households to smooth consumption in the face of output shocks.

**4.19** Chart 4.4 shows that US consumption has been among the most stable of major industrialised countries since the mid 1980s. This is confirmed in Chart 4.5, which indicates the average standard deviation of output and consumption over the period 1980-2001. It also shows that US consumption has been less volatile than output.

**4.20** As outlined in Section 3, one reason why consumption may be less volatile than output is that firm and households smooth over shocks to output through financial markets. The large integrated financial market in the US may have helped to promote this process.



## Conclusions on macroeconomic stability in the US

**4.21** The impact of monetary union on stability in the US is difficult to identify in the absence of a counterfactual. It is not possible to know how stable the US regions would be if monetary union had never existed.

**4.22** Evidence suggests that US output volatility has declined through the second half of the 20th century, particularly over the last 20 years, although this has largely been a consequence of structural factors; it is hard to identify an impact from monetary union.

**4.23** Since the mid 1980s, US consumption has been among the most stable of major industrialised economies. The large and integrated financial market in the US may have helped firms and households to smooth consumption in the face of shocks to output.

Monetary union may encourage cross-border trade and investment, and promote the development of a larger, more integrated and more competitive market. US microeconomic performance is impressive: productivity and employment are both high relative to international benchmarks. However, it is difficult to quantify how much of this performance can be attributed to monetary union:

- evidence suggests that trade is higher within the US monetary union than it would be if the states or regions adopted individual currencies;
- competition is found to be greater, and prices consistently lower, in the US than in other major economies;
- at a disaggregated industry level, US regions are more specialised than EU regions, which may increase industrial efficiency; and
- US financial markets are highly integrated, which may promote efficient capital allocation and reduce the cost of finance for firms.

**5.1** A monetary union offers important potential microeconomic benefits.<sup>1</sup> Alan Greenspan has highlighted<sup>2</sup> that if the US economy had had 50 currencies – one for each state – for the last 200 years, the US would be a less integrated and less productive economy today. If each US state had a single currency there would be an exchange rate transaction cost on all inter-state transactions. Firms and consumers would also be exposed to exchange rate volatility, which could add a further cost to inter-state transactions. Finally, with 50 separate currencies, there would be much lower price transparency across the US, making it difficult to compare prices across states.

**5.2** These factors (which would also apply if there were regional currencies) would add up to a significant potential barrier to inter-state trade and investment flows, and as a result such activity might be considerably lower than it is now. The US market would be more fragmented along state or regional lines, and this might reduce competition considerably. Rather than competing with firms from across the US, competition would to some extent be limited to much smaller borders. US firms would be less able to exploit the significant economies of scale they currently enjoy. This might further affect the pattern of industrial specialisation and concentration in the US. If firms traded less extensively across the US market, then they might be less likely to locate in geographical clusters of similar activity, reducing the potential clustering benefits of technology and knowledge spillovers.

**5.3** A single currency may also promote the development of an integrated financial market, which could promote more efficient capital allocation and may make it easier and cheaper for firms to raise capital for investment. A more integrated financial market also has the potential to promote macroeconomic adjustment, at both the regional and aggregate level, as has been discussed in earlier sections.

<sup>1</sup> In addition, a number of EMU studies by HM Treasury consider in detail the theory and evidence on the potential microeconomic benefits of EMU. For example, see the EMU studies *EMU and business sectors*, *EMU and the cost of capital*, *The location of financial activity and the euro*, *EMU and trade*, and *Prices and EMU*.

<sup>2</sup> Quoted by Ed Balls, Chief Economic Adviser to HM Treasury in the 2002 Cairncross Lecture. Available at [www.hm-treasury.gov.uk](http://www.hm-treasury.gov.uk).

**5.4** This section considers the evidence that the US has enjoyed microeconomic benefits from monetary union. Like the analysis of the potential macroeconomic benefits of monetary union, this is a difficult question to answer in the absence of a counterfactual in the form of the US with a number of separate currencies. To deal with this, the approach taken reviews the key elements of microeconomic performance in the US in recent years, and then considers whether monetary union may have influenced these.

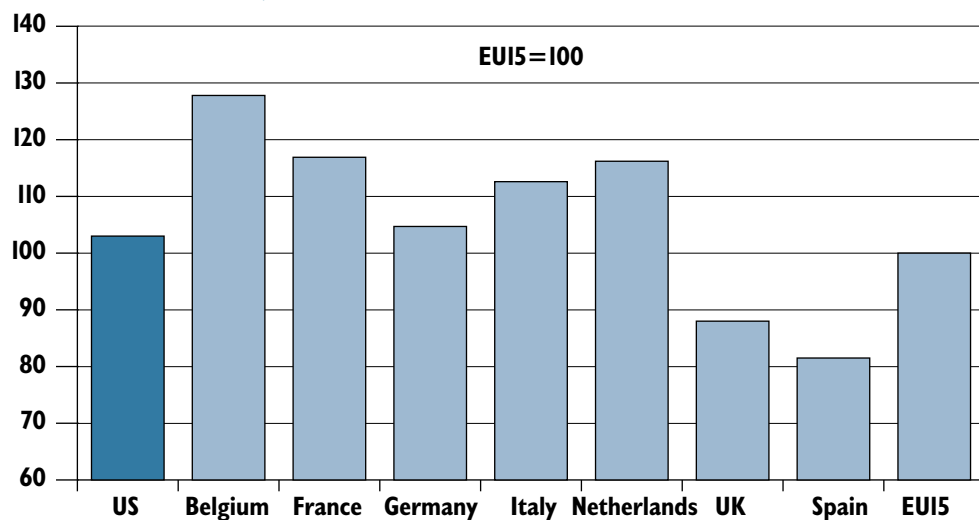
## US microeconomic performance

**5.5** A key theme of this study has been the strong post-War growth in the US economy. The second half of the 1990s was a period of particularly impressive economic growth, with GDP growing by 4 per cent a year on average. Key drivers of this growth were strong productivity gains and rising employment, in part, from an increasing labour force.

### US productivity performance

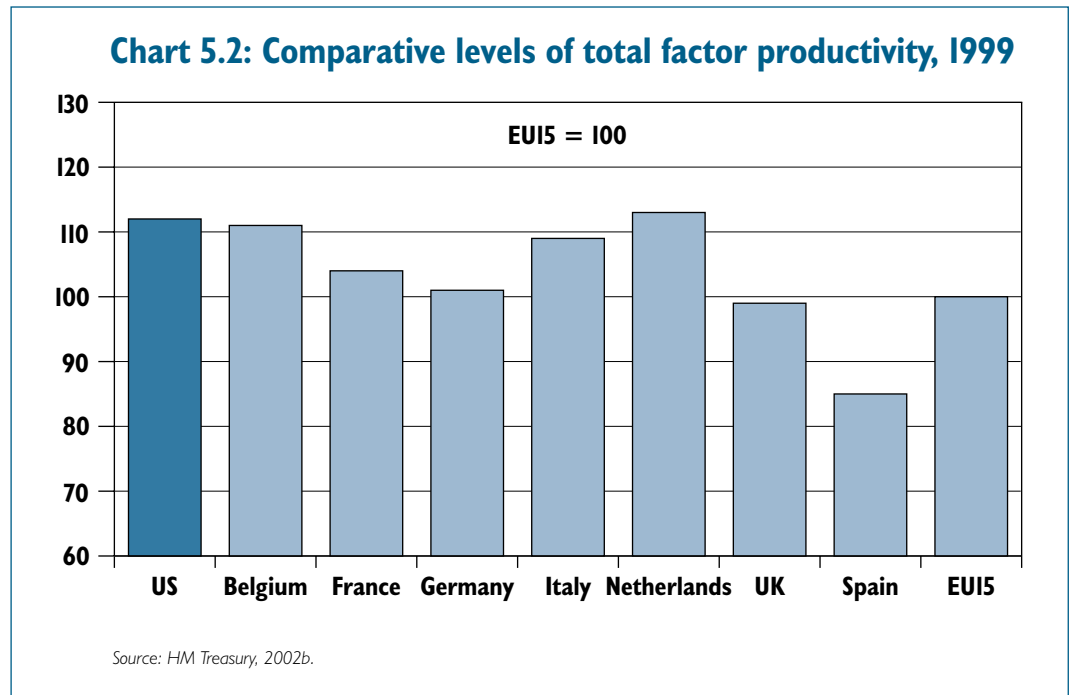
**5.6** Between 1995 and 1999, US productivity increased at an annual rate of over 2½ per cent, compared with a growth rate of around 1½ per cent a year in the two decades prior to 1995. By 2001, US productivity was, on Eurostat estimates, some 17 per cent higher than the EU total on a GDP per worker basis, but only 3 per cent higher on the basis of GDP per hour worked (see Chart 5.1). Although the aggregate EU performance lagged the US, some countries within the EU had productivity levels which were similar or higher.

**Chart 5.1: Comparative levels of labour productivity, GDP per hour worked, 2001**



Source: Eurostat.

**5.7** US performance exceeds the EU on a Total Factor Productivity (TFP) basis (Chart 5.2). This adjusts productivity for the effect of capital deepening, and is arguably a more relevant measure of productivity performance. On this measure, the US is more productive than the UK, Germany and France. A recent paper by HM Treasury concludes that there has been “*a lack of ‘dynamism’ in productivity performance in the EU, relative to recent experience in the US*”. (HM Treasury 2002b, page 13.)



**5.8** Box 5.1 summarises recent research focused on the role that advances in and utilisation of information technology have played in recent US productivity growth.

**US employment performance** **5.9** The US stands out for combining productivity performance with an impressive employment record. HM Treasury (2002a) argues that this combination is arguably “*the most impressive aspect of the US achievement. . .*” (page 14).

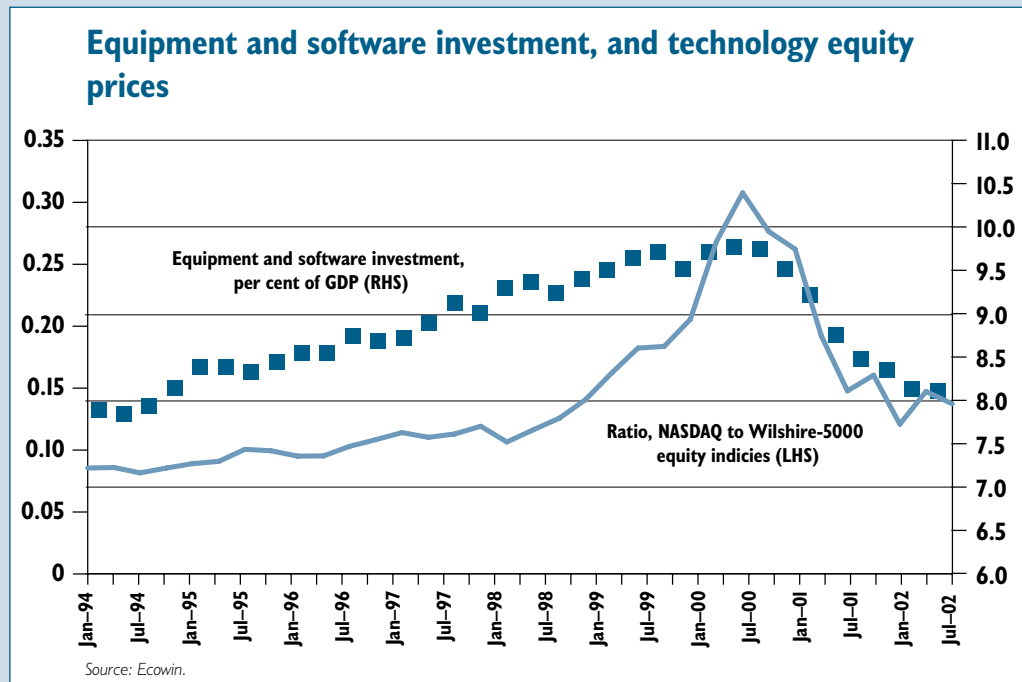
**5.10** Chart 5.3 shows that while productivity levels are higher (on a GDP per person employed basis) in the US than in the other economies surveyed, employment rates in the US are also higher. US employment is, on average, 10 percentage points higher than in the EU. This strong overall employment performance is likely to be a feature of the relatively flexible labour market in the US, as discussed in Section 3.

**Box 5.1: Productivity and the role of IT**

There is evidence of a strong contribution to recent US productivity growth from the production and use of information technology (IT). Oliner and Sichel (2000), for example, find that the use of information technology and the production of computer equipment accounts for around two thirds of the increase in productivity growth between the first and second halves of the 1990s. There are three particularly relevant features of IT investment:

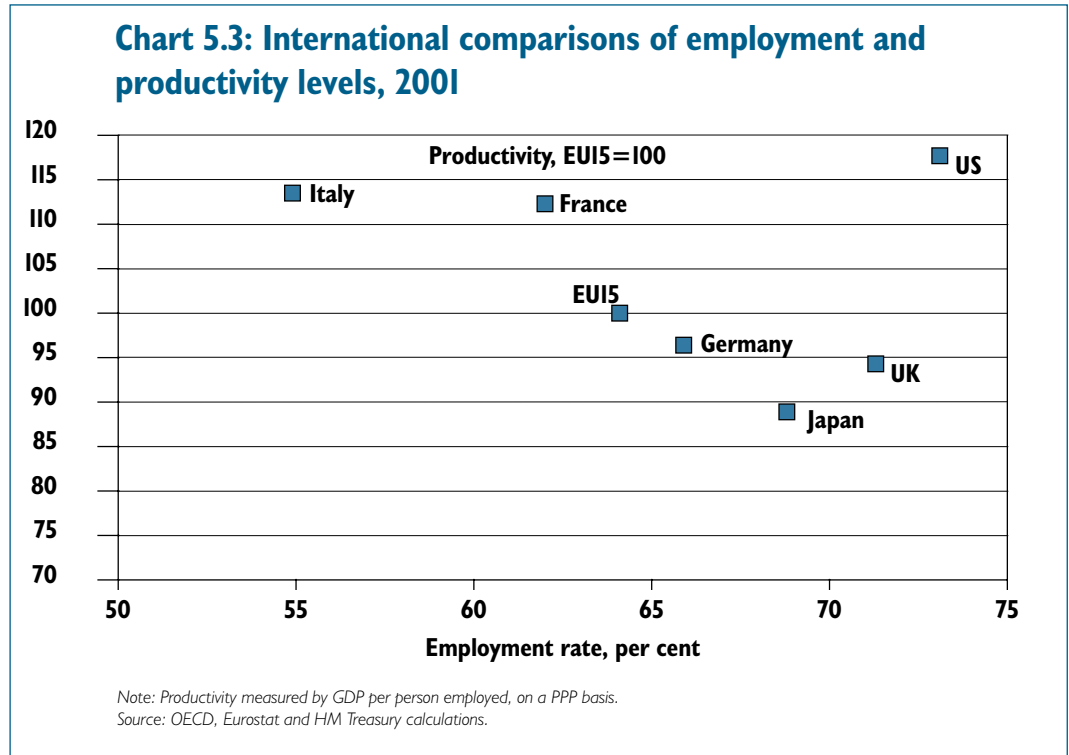
- it depreciates and is replaced quickly, so technological progress is embodied quickly into the capital stock;
- network effects allow the benefits of IT investment to spill over to other parts of the economy; and
- demand for IT investment is relatively more sensitive to changes in the cost of capital than in demand for other capital goods.

US macroeconomic stability and access to large, liquid financial markets, may have played a role in facilitating the significant US investment in ICT equipment. The chart below suggests a correlation between the pick-up in technology equity prices and ICT investment, suggesting that high-tech firms took advantage of relatively cheap capital in order to build up their capital stock.



But the application of IT may itself be a function of other factors. Baily (2002) highlights how Wal-Mart, and other retailers, adopted IT in order to develop a highly efficient supply chain, allowing them to compete vigorously in retail markets. But retail banks invested in high technology equipment that “were not really needed for the tasks that most bank employees were performing”. (Baily 2002, page 11.)

Overall, investment in IT is unlikely to have an impact on productivity unless it creates enough competition to trigger firms to reorganise and generate wider efficiency gains.



## The link from monetary union to economic performance in the US

**5.11** The question is whether monetary union in the US has contributed to this impressive economic performance. The potential feed through from monetary union to growth and productivity can be examined through four mechanisms:

- whether inter-state trade in the US is higher than across national borders;
- the development and implications of an integrated financial market in the US, in particular for the amount and quality of investment;
- whether there is evidence of higher levels of competition in the US; and
- the pattern of industrial specialisation in the US compared to other countries.

## US monetary union and trade

**5.12** An increase in trade stemming from the existence of a common currency is often advanced as one of the major benefits of a currency union. It is assumed that a single currency reduces the transactions costs of trade, eliminates the need for hedging of exchange rate risk and improves the transparency of costs and prices across the currency area. The EMU study by HM Treasury *EMU and trade* provides an overview of the theory and evidence on the impact of monetary unions on trade.

**5.13** This section considers whether there is evidence to suggest that trade within the US is greater than it would have been if US regions or states had separate currencies. To do this rigorously requires a comparison of intra-US trade with external trade. However, as noted in Section 2, trade data are not compiled fully for the US states. The empirical estimates in the literature tend to be based only on commodity flows data, which are of limited value because they:

- include goods for export that are simply transported from one state to another for shipment;
- include all flows, rather than simply from source to end-user; and
- are based on a limited coverage of trade in goods, without any coverage of services.

**5.14** Given that trade data are not available, it is necessary to turn to other sources of evidence. McCallum (1995), in an influential examination of Canadian provinces, found that Canadian provinces traded around twenty times more with each other than with US states of a similar size and proximity. But a later study, by Anderson and van Wincoop (2001), analysed trade from the perspective of US states rather than the Canadian provinces, and showed that borders reduced trade between the US and Canada by around 44 per cent – a lower, but still significant, figure.<sup>3</sup>

**5.15** The implication would appear to be that US regions trade with each other more than they trade with neighbouring Canadian provinces. However, there are factors aside from the single currency which may explain this:

- US states are politically integrated, and have a greater degree of cultural similarity;
- there are likely to be fewer non-tariff barriers to trade between states than between regions in separate countries; and
- in addition, there is no counterfactual example to assess the degree of trade if the US states had maintained individual currencies.

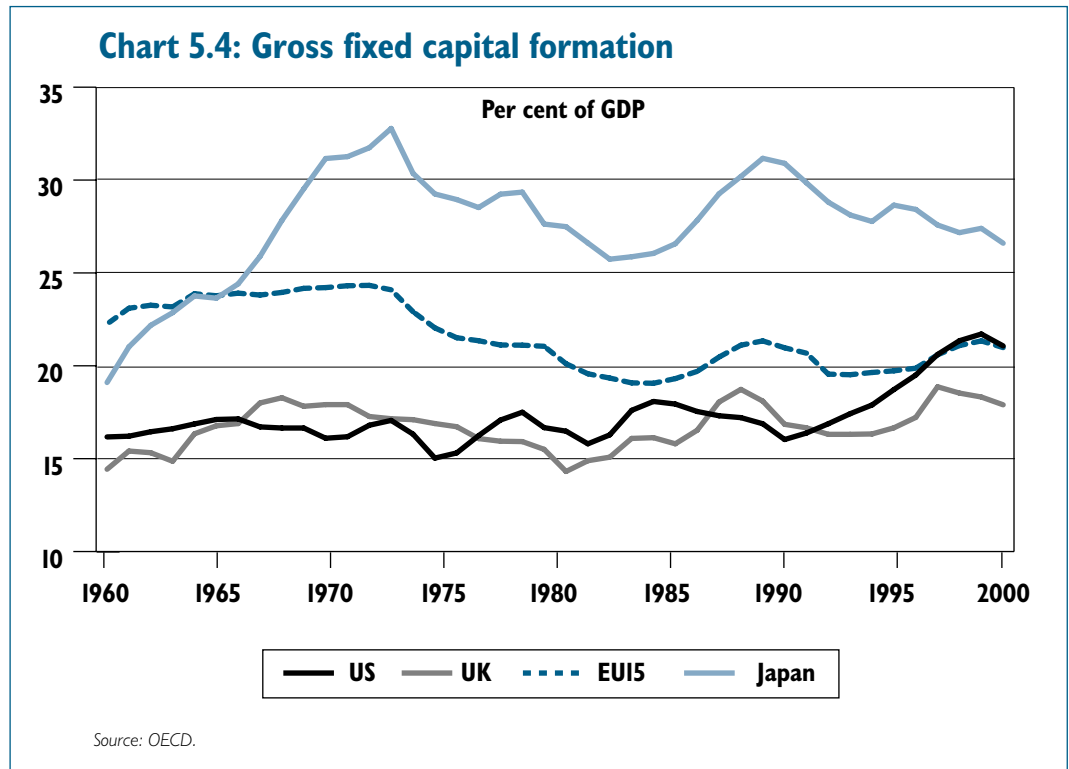
**Trade and output 5.16** The EMU study by HM Treasury *EMU and trade* assesses the analysis and evidence linking increased trade to gains in output. This approach could, in principle, be applied to analyse the output gains to the US from increased inter-regional trade but, in practice, the absence of reliable state or regional trade data undermines the worth of such an exercise.

## US monetary union and investment

**5.17** Increased investment is potentially a key driver of productivity. As Chart 5.4 indicates, investment levels in the US, as measured by gross fixed capital formation, were lower than in the EU until the 1990s. But they have risen sharply in the last ten years, coinciding with a period of faster US productivity growth.

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<sup>3</sup> Anderson and van Wincoop argue that the smaller size of the Canadian economy biases McCallum's work, since any trade barrier would affect Canada more than it would a given US state.



**5.18** Firms will only invest if expected returns from the investment exceed the cost of the investment. A volatile economic environment may also discourage firms from investing by reducing expected returns; the issue of macroeconomic stability in the US was considered in Section 4 of this study. The cost of capital is also an important driver of investment levels. The EMU study by HM Treasury *EMU and the cost of capital* considers the potential impact of monetary union on the cost of capital in detail, and some of the issues raised are relevant to the US experience.

**5.19** Large, integrated capital markets may potentially lower the cost of capital. Markets which have a large number of participants may reduce liquidity risk – the risk of being unable to find a buyer or seller for an asset at a reasonable price. Broad markets, where a range of different assets are traded, allow investors to diversify their holdings widely, which means they require a lower credit risk premium.

**5.20** This suggests that that the large size of US financial markets may have contributed to a lower cost of capital. London Economics (2002) note several features of US financial markets that point to its relative size and efficiency:

- **venture capital funds** in the US are some five times the size of those in the EU;
- compared internationally, **trading costs on equities** have a lower effective spread on the New York Stock Exchange (NYSE);
- total **market capitalisation** of the NYSE was some €11.2 trillion in 2001, compared to €2.2 trillion in the largest EU exchange (London);
- NASDAQ (based in New York) is the exchange with the highest **trading turnover** in the world; and

- **corporate bond markets** remain significantly larger in the US than in the EU – debt securities, as a percentage of total liabilities of non-financial companies, were 10.6 per cent in the US compared to 2.4 per cent in the euro area.

**5.21** However, there is little direct evidence of a lower cost of capital in the US. Comparisons of indicators such as the equity risk premium and the cost of bonds and bank lending do not consistently suggest that the cost of capital is lower in the US than in other industrialised countries. To a large degree this probably reflects the difficulty in accurately measuring the cost of capital faced by firms – these issues are discussed in more detail in the EMU study by HM Treasury *EMU and the cost of capital*.

**5.22** The integrated US financial market may benefit investment through another avenue. The US has achieved high productivity with, what were until recently, relatively low overall investment levels. This suggests that the US economy is successful at allocating investment to high productivity projects. One factor behind this may be that the large, integrated and flexible financial market in the US can efficiently bring together firms and potential investors from across the country. The noticeable upturn in US investment levels in the 1990s primarily reflects the sharp rise in IT investment and is an illustration of how the US capital market can quickly allocate resources to new, productive sectors.

## US monetary union and competition

**5.23** Increased inter-regional trade and investment should boost competition. McKinsey Global Institute (2001) find that competitive pressure was the key driver behind the recent productivity acceleration in the US, largely because it forced businesses to improve operational efficiency (as set out in Box 5.1). Greater competition may also raise productivity by eliminating slack within individual firms, and at the industry level by driving out the least productive firms.

**5.24** Importantly, the principle of open competition between firms across the US single market is enshrined in the Commerce clause of the Constitution, which reserves the power to regulate inter-state trade at the federal government level. Individual states are prevented from creating barriers to trade within the US – a critical institutional element of the US monetary union. Although banking has, at least to some extent, been subject to state restrictions (as discussed later in this section), even this sector has been opened up to greater competition in recent years.

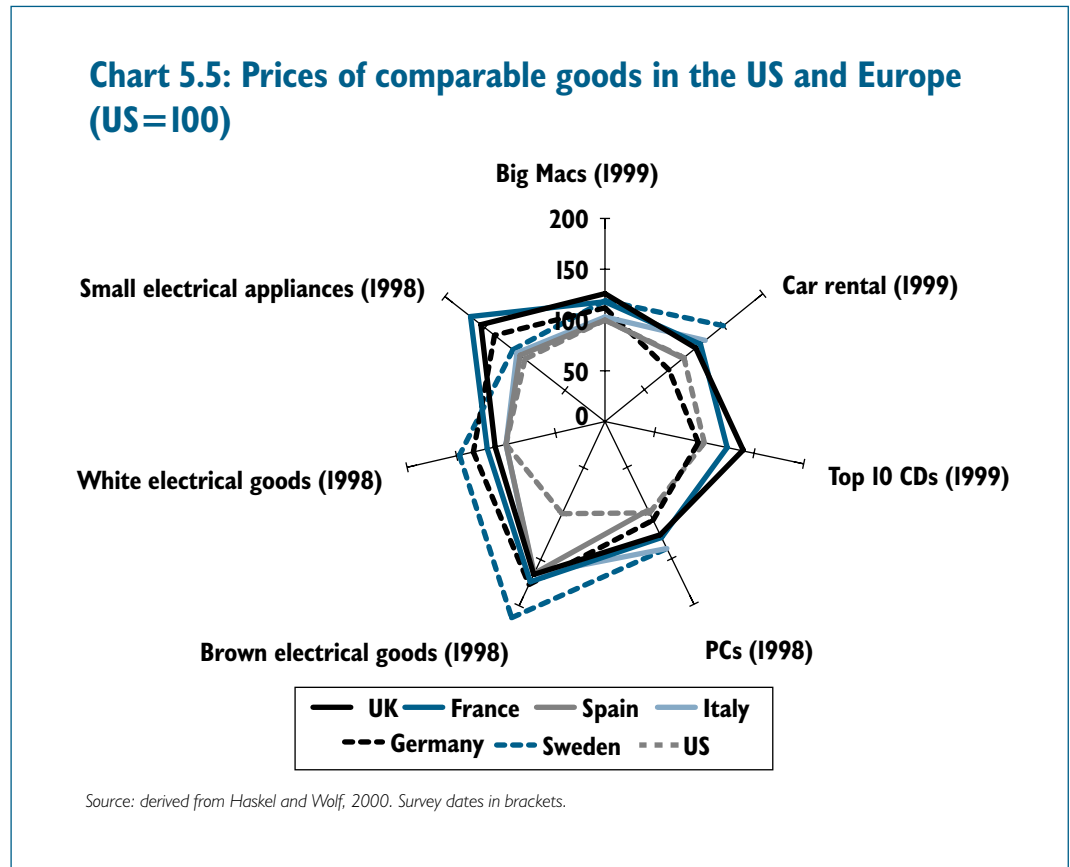
**5.25** Over the long run, competitive forces should eliminate large price differentials between regions.<sup>4</sup> So a key indicator of the level of competition in an economy is the degree of price convergence between regions. Prices are more easily measured and observable than trade data in the US, and so are a useful source of evidence on the degree of US market integration. (See the EMU study by HM Treasury *Prices and EMU*.)

### Prices as an indicator of competition

**5.26** Evidence quoted by Baily (2002) suggests that prices in the US are lower than in other major industrialised countries; on average US prices are 15 per cent higher than the lowest prices available among a set of countries, compared to 42 per cent higher in the UK, 62 per cent higher in Germany and 85 per cent higher in Japan.

<sup>4</sup> Even in a perfectly competitive market there will be some variation in prices across regions, because of factors such as transport costs and differences in the prices of non-traded goods such as land.

**5.27** Chart 5.5 below, derived from Haskel and Wolf (2000), summarises evidence on prices for a number of goods in the US, compared with major European countries. Although not the cheapest for all goods, the US stands out for consistently having among the lowest prices for all of the goods in the sample, which suggests higher levels of price competition.



**Competition and monetary union** **5.28** There may also be non-price competition not represented by these data. But accepting the premise that competitive pressures are stronger in the US, how much can be attributed to monetary union?

**5.29** Parsley and Wei (2002) assess the relationship between exchange rate regimes and market integration, based on deviations in prices within economic regions and countries. Using data on prices for 95 goods in 69 countries worldwide over the period from 1990-2000, they compare the degree of goods market integration under different exchange rate regimes and find that:

- there is a much stronger integration effect in economies that adopt a more institutionalised exchange regime, such as a currency board or currency union; and
- goods markets are more highly integrated in the US than in other currency arrangements. Of course, this may reflect factors such as the US's common language and institutions as well as the currency union effect. Broadly supportive results are obtained by Rose and Engel (2001), who find that real exchange rates have much lower short-term volatility within currency unions.

**5.30** Overall, this evidence supports the thesis that if the US regions or states had separate currencies, they would not be as highly integrated and competitive as they are now. Baily (2002) provides a neat summary of this effect, which also notes that to encourage an improvement in productivity, competition should not just be within the internal market, but also in the global marketplace:

*“The 1990s economy experienced heightened competition in an increasingly deregulated economy with strong international competition. In particular, US service industries, which often compete on a global scale, sought out new technologies to improve their productivity. If the new economy were the result of a random surge in innovation, then all countries should have had similar changes together. After all, the new technologies are available globally. In practice, the US economy has been well ahead of most of the industrialised countries and a reason for this is that the United States has highly competitive markets in the industries that are using information technology.”* (page 16)

**5.31** But these competition effects must not be seen in isolation. The real exchange rate, working through prices, is a key adjustment mechanism in monetary union in the short to medium term.

**5.32** Competition, brought on by rapidly changing technology and the loss of older, traditional industries, may also give rise to unemployment. The fact that US employment performance is so good serves to illustrate the value of flexible markets in reallocating resources from older to newer, emerging industries. This type of flexibility is important whatever the monetary arrangement, but membership of a monetary union puts an even greater premium on it (see the EMU study by HM Treasury *Modelling shocks and adjustment mechanisms in EMU*).

## US monetary union and specialisation

**5.33** Increased trade and investment within a monetary union, and higher levels of competition, may act to promote industrial specialisation, where regions specialise in certain types of economic activity. A survey of the evidence on specialisation is contained in the EMU study by HM Treasury *EMU and business sectors*.

**5.34** Specialisation offers potential productivity gains because technology and knowledge spill overs may be higher if similar firms are located in geographical clusters. Clusters may build up considerable economies of scale which allow them to compete in both national and international markets. Krugman and Venables (1993) describe the case of Detroit’s specialisation in motor vehicle production:

*“Barriers to trade between national economies . . . are often enough to block the expansion of a successful industrial district beyond its national market. Detroit’s initial advantage allowed it to crowd out its competitors [in motor vehicle production] in New York, Connecticut and Pennsylvania before World War I; no European automotive centre could do the same in the far less integrated European auto market.”* (Krugman and Venables 1993, page 2.)

**5.35** However, there is also the prospect, examined already in Section 2, that higher specialisation increases the risk of more pronounced asymmetric shocks. This depends critically on the type of specialisation that occurs. If different regions specialise in production common to the same industries (for example, if one specialises in car tyres while another specialises in engine production), the degree of similarity in shocks is likely to be greater than if they specialise in totally unrelated goods or services.

### Specialisation in the US compared to the EU

**5.36** A good deal of the research in this area compares specialisation in the US with the EU. It is difficult to provide precise comparisons because the data are affected by the size of regions sampled – smaller regions are more easily affected by the location of specific industries, and tend to distort the data. However, the US appears to be more specialised on most measures. For example, Table 5.1, reproduced from Krugman and Venables (1993), shows that employment in three specific sectors is more concentrated in individual regions of the US than in the EU countries. For example, 51.8 per cent of US steel industry employment is in the Midwest region. By comparison, Germany has the largest share of steel industry employment in the EU, but it accounts for only 20.2 per cent of this total.

**Table 5.1: Shares of industry employment**

Per cent	Steel	Cars	Textiles
<b>US (1990)<sup>1</sup></b>			
Northeast	13.4	7.9	14.2
Midwest	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

<sup>1</sup> BLS census regions.

Source: Krugman and Venables, 1993.

**5.37** Midelfart-Knarvik *et al.* (2000) also find that the US is more specialised than the EU on the basis of a measure of specialisation known as the Gini coefficient<sup>5</sup> (see Table 5.2). They also show that US specialisation has been declining since the 1970s; the US Gini coefficient has fallen from 0.45 in 1970-1973 to 0.37 in 1994-1997. However, as noted by the authors, it is difficult to determine the forces driving these patterns, particularly since the majority of industries observed share the trend towards dispersion.

**Table 5.2: Specialisation in the US and EU**

	Gini coefficient			
	1970-73	1980-83	1988-91	1994-97
US average	0.45	0.41	0.39	0.37
EU average	0.25	0.23	0.25	0.26

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

**5.38** However, other studies have found that specialisation in the US is not necessarily higher than in the EU. Peri (1998) found that in 1986 the degree of specialisation in the US was about the same as that in Europe. Clark and van Wincoop (1999) use data on ten broad categories of manufacturing and services and conclude that US regions are, on most measures, less specialised than the EU and that between 1981 and 1995 the US became less specialised.

<sup>5</sup> The Gini coefficient is a measure of specialisation that summarises the distribution of production across industries in a given country. A higher coefficient indicates a higher degree of specialisation.

**Interpreting the evidence on specialisation** **5.39** One explanation of these different results relates 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.

**5.40** It is specialisation at more aggregate levels that tends to influence the degree of business cycle convergence – hence while US regions appear to have specialised at disaggregate levels of industry, this does not necessarily imply more business cycle divergence than would otherwise be the case. Indeed, Clark and van Wincoop (1999) find that as specialisation decreases across the US, business cycle correlations also fall.<sup>6</sup>

**5.41** Thus, while Section 2 of this paper notes that industrial structure in the US is a factor in regional economic divergence, the results do not support the conclusion that monetary union, by facilitating specialisation, has contributed to greater divergence in regional business cycles.

**5.42** Indeed, given the strong economic performance of the US economy over the past fifty years, it seem likely that the microeconomic benefits of specialisation have outweighed any potential macroeconomic costs. The fact that the US economy is able to adjust to regional industry shocks, through financial market risk sharing and labour mobility, will also have helped to reduce the potential macroeconomic costs.

## US monetary union and financial markets

**5.43** US financial markets are frequently thought of as a key contributory factor to strong US economic performance in recent years – promoting the availability of relatively low cost and easily accessible capital to finance new investment. The depth and liquidity of financial markets may in part be a function of the single currency, with finance available without exchange rate risk or transaction costs from across the US.

**The impact of monetary union on the development of US financial markets** **5.44** The development of US financial markets started with the formal creation of monetary union in the late 18th century and the ratification of the Constitution in 1788. After US independence, the first Treasury Secretary, Alexander Hamilton, proposed a series of reforms to the US financial system, many of which tended to favour the creation of federal structures and institutions at the expense of each state's authority. State debts were to be restructured into newly created Treasury securities, and the Federal Government was given the authority to raise revenues from customs duties and excise taxes, thus allowing it to pay interest on debts. In addition, Hamilton proposed the creation of the First Bank of the United States to assist in federal financial operations, and to lead the development of a nationwide banking system (Sylla, 1995).

**5.45** The impact on financial markets was that active, regulated trading markets emerged for the exchange of federal securities, notably in the three cities where banks had first opened – New York, Philadelphia and Boston. The emergence of trading markets made the issue of equity securities more attractive to investors because they could be easily bought and sold.

**The location of financial markets in the US** **5.46** An important issue for the UK is how monetary union impacts on the location of financial activity. The EMU study by HM Treasury *The location of financial activity and the euro* considers the key drivers of financial market location. The US example is particularly useful because the existence of financial markets pre-dates both the creation of the political centre of gravity in the US around Washington DC and the huge territorial expansion of the 19th century, which integrated vast new areas into the economy. By examining this evolution,

<sup>6</sup>This result appears intuitively odd, but may reflect the fact that specialisation, depending on how it is measured, need not be correlated with divergence in business cycles.

**BOX 5.2: US financial services history and location**

The first three banks in the US were founded in three cities – New York, Boston and Philadelphia – in the 1780s. These were local banks, isolated from each other in the absence of any banking system. It was also in these three cities that the first securities markets developed, to be followed by Baltimore soon afterwards. Significantly, the establishment of US securities markets precedes the establishment of the nation's capital in Washington DC.

In today's terms, the three markets appear relatively close geographically. New York and Boston are around 200 miles apart, while only 100 miles separates New York from Philadelphia. However, communication delays existed between the cities in the early days which helped each to establish and grow independently — it took a couple of days to travel between Philadelphia and New York, and a further week to Boston. Despite this, Sylla (1998) finds evidence of integration and efficient pricing between these three major markets from the beginning. Sylla also notes that New York was the most active of the markets, even though Philadelphia was widely regarded as the leading financial centre.

New York's role as the pre-eminent US port appears to have helped its financial development. Merchants from elsewhere in the US needed exchanges in New York to pay for their goods. The connections between the banking and securities markets were also critical. Indeed, Banner (1998) argues that by 1840, New York had established itself at the centre of securities trading in the US. The development of the telegraph helped cement this position because, by the 1850s, New York was effectively setting stock prices for other large US cities.

As the country expanded, it was the Northeast US that witnessed the most rapid development of financial markets and banking. By 1830, Sylla (1998) records that the New England and Mid Atlantic regions of the US were home to roughly 86 per cent of US banks and 72 per cent of banking capital. In part, this may reflect inter-state banking restrictions; East coast banks were forced to issue securities because they were unable to loan directly to the West, where investment capital was in strong demand.

The early strength of the Northeast stock markets probably also helped to stymie the development of some financial markets in the South and West. Atlanta and Dallas emerged as regional banking centres in the South, yet many banks in these cities chose to insure against large credit demands by linking with banks elsewhere in the country. Odell and Weiman (1998) report that in 1880, 90 per cent of Georgia banks had turned to banks in New York for their primary correspondent<sup>a</sup> while the figure was 97 per cent for Texas. In this way, New York's early-mover advantage was reinforced. The rapid spread of banking post-1880 stimulated demand for regional banks, which tended to concentrate around the railroad hubs – Atlanta and the twin cities of Dallas-Forth Worth in particular.

By the time the Federal Reserve was founded in 1935, Atlanta and Dallas were the dominant regional financial centres in the Southern US. Both were chosen as homes for regional Federal Reserve banks, which arguably helped their positions as regional financial centres (see Odell and Weiman, 1998).

The importance of Chicago as a financial centre owes much to its location. The Chicago Board of Trade was formed in 1848 for the trading of agricultural commodities, and it was this specialism that led to the development of futures contracts. To get round problems of storing corn throughout the cold winters, merchants bought from producers, and used the Chicago markets to sell to processors at an agreed price, for delivery in the following spring. The first recorded futures contract took place only three years after the exchange's birth and laid the foundations for Chicago to become the world's largest derivatives exchange.

<sup>a</sup> A bank that accepts deposits and performs banking services for other depository institutions.

and the pattern of financial location today, it is possible to identify whether economic integration has influenced the location of markets. A summary of some of the main historical influences on US financial market location is contained in Box 5.2.

**5.47** The involvement of different sectors and different geographical areas provides anecdotal support to the suggestion that monetary union between the different US states contributed to the early development of US capital markets. However, it is difficult to disentangle the effects of monetary union from political union – the creation of federal level Treasury securities was also an important factor in the development of US capital markets.<sup>7</sup>

**Financial market  
regulation in the  
US**

**5.48** US capital markets do not have a single regulator (see Box 5.3). Regulation has tended to take an evolutionary approach, developing in response to need, rather than following an *ex-ante* model of regulatory organisation. In part, this is a function of a reluctance to centralise, particularly the banking system, and shift power from the state to the federal level. The degree of regulatory overlap between different bodies is limited by statutes and agreements between institutions. For example, an agreement between the Federal Reserve, the Office of the Comptroller of Currency and the Federal Deposit and Insurance Corporation (FDIC) assigns primary supervision among them, and a degree of co-ordination is achieved through the Federal Financial Institutions Examination Council (FFIEC).

**5.49** Far from hindering development, this decentralised approach to regulation may well have benefited the development of US financial markets. The ‘dual’ system of banking (state versus national banks) was often seen as a means of preventing one bank or a cartel from gaining excess market power. It was to preserve this status that, until recently, banks which were members of the Federal Reserve were prohibited from branching outside of their home state.

**5.50** US regulatory decentralisation has possibly also helped market innovation, allowing individual states to innovate with different regulatory practices and quickly respond to the development of new banking practices. Greenspan (1998) argues that “*the dual banking system also offers protection against over zealousness in regulation by permitting banks to have a choice of more than one federal regulator by the act of selecting a state or federal charter*”. By not sticking rigidly to a specific, *ex-ante* institutional design, the US system is arguably good at reacting to new products, and corporate developments such as the blurring in recent years of boundaries between banks, investment banking services and insurance. Regulators, at both the state and federal level, are forced to compete and respond effectively to the changing demands of the industry.

<sup>7</sup>The development of securities markets also helped the US to expand territorially. The US was able to borrow from European investors to finance the purchase of the Louisiana territory from France in 1803 (Sylla, 1995).

**Box 5.3: US financial services regulation**

The US operates without a single financial services regulator, in contrast to the current UK model. Patterns of regulation vary according to the type of business carried out:

- **insurance business** is regulated at a state level, though the National Association of Insurance Commissioners (NAIC) aims to help co-ordinate the regulation of multi-state insurers;
- **banking regulation** varies according to the particular type of bank and the business being conducted. A key distinction is between State Banks, chartered by state governments, and National Banks chartered at the federal level by the Office of the Comptroller of the Currency:
  - for National Banks, the Office of the Comptroller is the main regulator, and all are required to be members of the Federal Reserve System. The Federal Reserve System also has supervisory power over bank holding companies, through which the majority of banks are organised;
  - State Banks are subject to sub-federal regulators at the state level, such as the New York State Banking Regulator (NYSBR);<sup>a</sup>
  - deposits of both state and national banks are insured by the Federal Deposit Insurance Corp. (FDIC), which has supervisory power over any institution that it insures. All banks that are members of the Federal Reserve System must insure their deposits with the FDIC; state banks do not have to, but most choose to do so; and
  - savings and loans and credit unions each have their own state or federal supervisor (or both).
- **securities trading** is largely regulated by the Securities Exchange Commission (SEC) at the federal level, with derivatives trading regulated by the Commodities and Futures Trading Commission (CFTC). State-level regulators also exist, but the SEC and CFTC retain primacy.

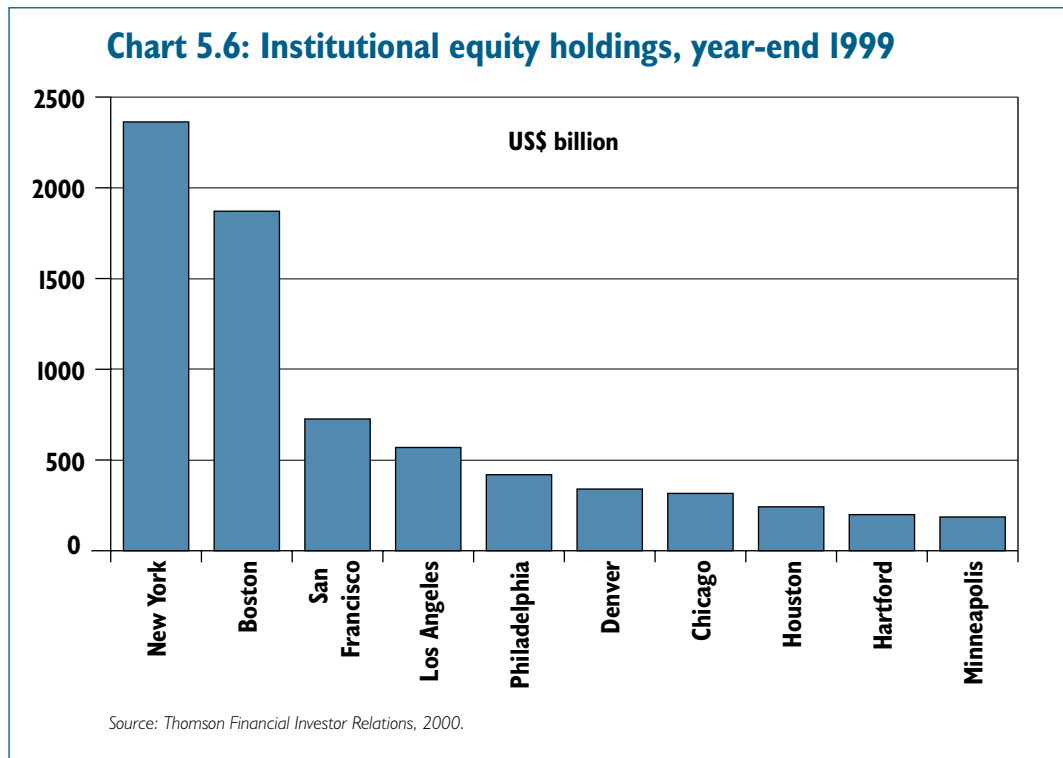
<sup>a</sup>There are two kinds of State Banks: Members (of the Federal Reserve System) and Non-Members. Members are supervised by the Federal Reserve in cooperation with the state supervisor; Non-Members (mostly small banks) are supervised at the federal level by the FDIC, also in cooperation with state supervisors.

**5.51** This does not offer a guarantee that there could not, in the future, be disturbances to the financial system. Historically, the US regulatory system has shown itself capable of adjusting to meet specific challenges – *ex-ante* it is difficult to identify an area in which the current system is lacking. Moreover, concerns that regulatory competition would lead to a ‘race-to-the-bottom’ in regulatory standards do not appear to have had foundation.

**The current position: equity holdings**

**5.52** Having established the historical evolution of US financial markets, this section considers the current position of the sector. Chart 5.6 illustrates the relative importance of major US cities in terms of institutional equity holdings:

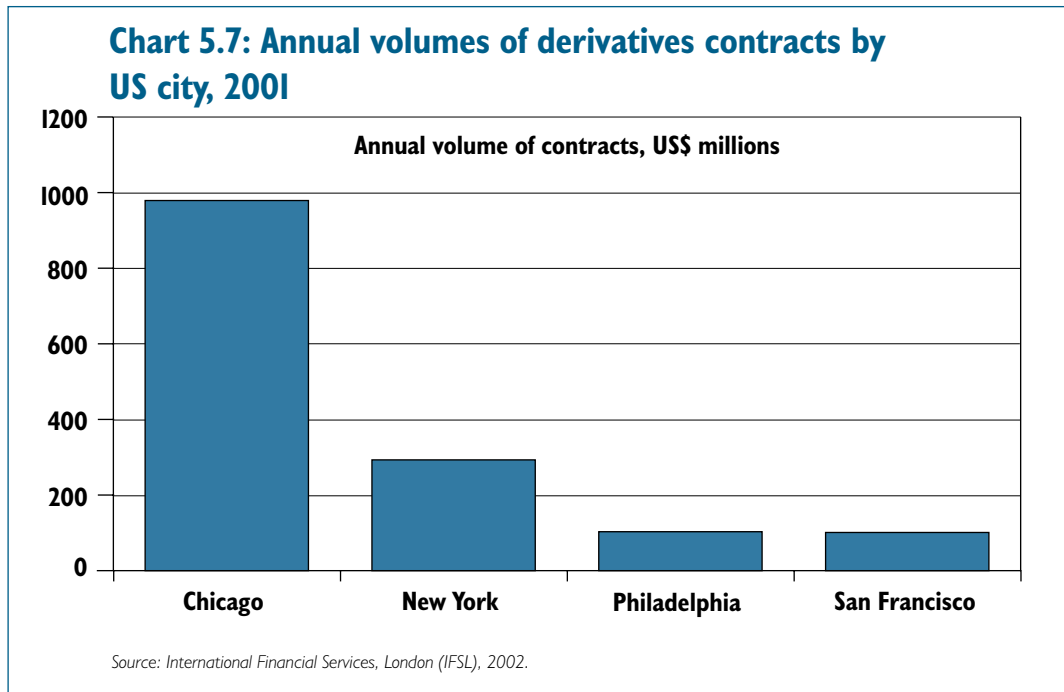
- the US fund management industry is dispersed over several different centres, although New York and Boston are dominant; and
- the three original centres of finance in the US remain important today. New York and Boston are still the two largest centres for equity management despite 200 years of integration and the two cities being a relatively short distance apart. Philadelphia also remains an important centre.



**5.53** Although New York is the largest base for US equity management, its share has declined in recent years. The passage of the Gramm-Leach-Bliley Act in 1999 accelerated consolidation within the securities industry, and the cost of doing business in New York has drawn increasing attention. New York's share of securities industry employment declined from 39 per cent to 26 per cent between 1980 and 2001 according to the Securities Industry Association (SIA), who also note that a number of major financial institutions have reacted to rising rents by relocating at least some of their operations to nearby New Jersey (SIA, 2001).

**Derivatives trading** **5.54** Chart 5.7 indicates that Chicago, the city in which derivatives were first developed, maintains its advantage in this market. This is despite New York being a more important financial centre overall. Chicago maintains a greater degree of dominance in the derivatives market than does any city in the fund management industry, partly a result of having merged with a number of other Mid-West exchanges in the 1940s and 1950s.

**5.55** These patterns suggest that there is a degree of first-mover advantage in financial market business. Those cities where markets develop first (whether by historical accident or technical expertise) have retained a significant part of their business even in the face of competition from other cities. This suggests that agglomeration effects may be quite long-standing, as financial networks and expertise develop in particular areas. This also appears to sustain itself in the face of at least some innovation in the industry. Chicago developed as a derivatives market because it was the pre-eminent commodities trading city in the US. More recently, it has been derivatives on exchange and interest rates that have grown significantly – yet Chicago has gained a dominant position in this market too.



**5.56** The data also suggest that different financial centres can co-exist in a monetary union, even within a relatively small geographical area. Four of the top ten US fund management centres are located in the North East US (New York, Boston, Philadelphia and Hartford), while a further two are located in California (Los Angeles and San Francisco). While other more regional markets such as Minneapolis, Denver and Houston have developed, there does not appear to be any strong evidence of either dispersion of business across the country or strong regional consolidation. In addition, the data show it is possible for cities to specialise in different markets within a single currency area, and for a city to be a leader in one market but a minor player in others.

### Conclusions: microeconomic benefits of monetary union in the US

**5.57** In the absence of a counterfactual, and because the US economy has been subject to many technological, taste and output shocks, it is difficult to identify the benefits of even an established, successfully functioning, monetary union. The US is a wealthy nation, with high levels of productivity and employment. Is any of this due to the existence of monetary union?

**5.58** Although impossible to quantify, the answer is almost certainly yes. The size and integration of the US economy has contributed to a high degree of competitive pressure, trade between its various regions and opportunities for factors of production to move efficiently across a large economic area in order to exploit efficiencies. Of these, the competitive effects derived from the existence of a single, trans-continental market with a single currency, are arguably most easily identified.

**5.59** The US also benefits from having a high degree of flexibility. Section 3 shows that labour market adjustment mechanisms, particularly employment flexibility and labour mobility, facilitate a relatively rapid reallocation of resources when US regions experience region-specific shocks. High flexibility alleviates the effects of such shocks on the overall performance of the economy.

**5.60** Similarly, there has been a beneficial impact from the development of the financial markets in the US. The creation of monetary union probably helped the initial development of US financial markets – and features of the early US economy helped cities such as New York and Boston to establish an early advantage in financial services. Since then, long-standing patterns of location in financial markets appear to have been sustained, despite innovation in financial markets.

**5.61** The US capital market is important for two reasons. On the one hand, the availability of deep, liquid financial markets has almost certainly contributed to US economic performance, providing capital efficiently to firms across the country. On the other hand, they have also probably contributed to the successful functioning of the monetary union – in terms of providing a means for US investors to share risk across the country (discussed in Section 3), helping disperse the effects of asymmetric shocks.

**5.62** Other factors have also helped – for example, an entrepreneurial spirit, and the regulation of inter-state commerce at the federal level, which has helped to preserve the single market and prevent barriers to trade being erected at the state level. But the size of the US single market has almost certainly been an important factor in achieving a high level of productivity, and the single currency has almost certainly facilitated this.

# 6

## CONCLUSIONS: THE US AS A MONETARY UNION

**6.1** This study has considered how the US functions as a large economy with a single currency, and how this has contributed to economic performance. To do this, the study has examined the costs and benefits of monetary union in the US; assessing the degree of divergence in regional business cycles; how regions adjust to a single monetary policy; and how the existence of a single currency has benefited the US in terms of both macroeconomic and microeconomic performance.

**6.2** The conclusions of the study provide valuable evidence for some of the key issues considered in HM Treasury's assessment of the five economic tests:

- a monetary union can survive (and prosper) with quite varied business cycles, and in the presence of asymmetric shocks;
- various adjustment mechanisms exist to help regions adjust to asymmetric shocks, but tend to be appropriate for different kinds of shock. For example, labour mobility is higher in the US than in Europe, but its effectiveness in adjusting to temporary shocks may be limited;
- US federal fiscal policy plays a far greater role in assisting regional adjustment than EU fiscal policy does in Europe. But in Europe, national fiscal policy assists regional adjustment much more than state level policy does in the US. Overall, fiscal policy appears to provide as much, if not more, assistance to regional adjustment in Europe than in the US;
- consumption has been more stable, on average, in the US than in other G7 economies since 1980, indicating that deep, well-integrated financial markets have helped US households and business to spread risk;
- the single currency has almost certainly helped stimulate inter-state trade and investment, and provided a spur to competition, which appears to be significantly more intense in the US than in Europe; and
- the single currency in the US appears to have aided the development of US financial markets, but does not appear to have influenced changes in the location of financial market activity to any significant degree.

**6.3** The study does not draw direct conclusions from this evidence for EMU or the question of possible UK entry. A direct comparison between the US and euro area is difficult for a number of reasons, most notably that the institutions and policy frameworks of the US monetary union have evolved over a significant period of time in response to economic need, and not according to an *ex ante* design as in the euro area.

**6.4** Moreover, the political context for the two monetary unions is very different. Ultimately the US states chose federal structures for fiscal policy to underpin political union. In the EU, fiscal policy is the responsibility of Member States – as set out in the Stability and Growth Pact, and subject to the provisions of the EC Treaty.

**6.5** This suggests that perhaps the most important lesson from the US experience is that a key feature of a successful monetary union is a high degree of confidence that, should difficulties occur, both the economic and institutional structures of the union have the capacity to evolve and meet emerging challenges.



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# A

## ANNEX A: HISTORY OF THE US MONETARY UNION

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**A1** When the Articles of Confederation were ratified in 1781, the US comprised 13 states and occupied only a small part of the area that it now does. But the formative country was expanded in several steps, including: the Louisiana purchase of 1803 from France that, in bringing Western and Southern regions into US hands, almost doubled the size of the country; and, victory in the Mexican War, which brought the land of 7 future states, including Texas and California, into the Union (1846-48). The country covers a diverse range of physical topography – from the desert regions of the West (e.g. Nevada, Arizona), mountainous regions (e.g. Colorado, Western Montana) to the rich agricultural plains of the Midwest (e.g. Kansas, Nebraska, Indiana).

**A2** Monetary union in the US arguably began with the ratification of the Constitution in 1788. Prior to that time, currency had varied across the formative country, in part reflecting different colonial heritages – sterling and the Spanish peso were accepted across the states, and individual colonies attempted to introduce paper currencies of their own. Generally speaking, these monies could not be exchanged for gold or silver, and were known as ‘bills of credit’ – the best known of which was the ‘continental’, issued by the Federal Government during the Revolutionary War. Even after the War, each of the colonies was able to issue their own bills.

**A3** The Constitution changed this, making the first real steps toward a monetary union. Kim (1997) argues that the Constitution laid the political foundations for economic integration “...by prohibiting taxes and duties on interstate commerce and by ensuring interstate mobility of people and capital” (page 5). It also gave Congress the exclusive right to coin money, and prevented individual states from issuing their own paper money. By creating a monetary union in this way, the Constitution aimed, in part, to defuse tension between states that had disagreed widely on how monetary policy should help the agricultural sector recover from a period of rapid deflation (Rockoff 2000).

**A4** An alternative option would have been for the states to pursue greater integration through fixing the value of the states’ currencies with respect to one another (i.e. without the adoption of a single currency). Rolnick *et al.* (1993) argue that the states viewed such a system as undesirable, because it would have allowed individual states to increase their own rate of money supply at the expense of others, earning seigniorage revenue in the process, and potentially driving up the rate of inflation. Experience of high inflation due to the over-issue of the continental was also fresh in many minds – indeed, the continental depreciated so much during the course of the war that it gave rise to the saying ‘not worth a continental’. Thus, the institutional arrangement of giving up, to the Federal Government, the power to issue money, was seen as an essential step toward economic integration.

**A5** The United States dollar was introduced in early 1792. From this point, individual states were unable to issue their own currency, although both the Federal Government and private banks retained the right to issue their own banknotes. Just prior to this, the first US Treasury Secretary, Alexander Hamilton, suggested the establishment of a first central bank – the First Bank of the United States, established by Congress in 1791. Based in Philadelphia, the Bank was the largest corporation in the US, and was responsible for issuing a paper

money across the country of uniform value. But due to worries over the size and power of the central bank, it was wound up when its 20-year charter expired in 1811,<sup>1</sup> as the bank was often seen as representing the wants of the privileged over what remained a largely agrarian population. Similarly, the Second Bank of the United States, established in 1816, was also dismantled after its 20-year charter expired, and a further 77 years would pass before the US would again have a central bank, with the creation of the Federal Reserve System. Thus, despite the move towards a single currency, moves toward creating a central bank in the US took longer.

**A6** Following the demise of the Second Bank, the ‘Free Banking Era’ reigned, during which a huge number of state-chartered banks operated without federal regulation. Almost anyone was able to issue currency, so a variety of paper monies circulated at any given time. Rolnick *et al.* (2000) argue that since no bank regulation provided for costless par redemption, this initial attempt to introduce a common currency was a failure. It is estimated that by 1860, roughly 8000 different banks were circulating ‘broken’ currency,<sup>2</sup> so called because the banks frequently failed, making the notes worthless. The National Bank Act, passed in 1863 ended this period, and established a national banking system for the first time. Newly created National Banks became responsible for issuing a uniform paper currency, backed by the purchase of government securities, and in 1865, a 10 per cent tax on state bank notes was introduced, effectively pushing them out of existence.

**A7** The US Civil War lasted from 1861 to 1865. Eleven states seceded from the Union to form the Confederate States of America in the period between December 1860 and May 1861, as arguments over slavery, tariffs, and the integration of new territories in the West caused friction between states. To finance the war, the government broke the link between the dollar and gold, and issued its first paper money since the continental, the greenback – so called because it was printed in green ink – between 1861 and 1862. But this change did not reach across the entire country, as the Civil War had the effect of dividing the nation into three monetary areas. The southern states used a money standard based on the Confederate dollar (backed by cotton), while the East and Mid West used a standard based on the greenback. The Pacific states, meanwhile, continued to use gold as the standard for their currency.

**A8** With the fall of the Confederacy in 1865, the southern states moved to the same greenback system as the Northeast. From 1863, the National Banks had begun issuing currency. Yet the Pacific states remained on the gold standard for some time; so despite the achievement of political union, two currencies circulated at a floating exchange rate. Interest rates tended to be higher in the Pacific states. The two were reunited in 1879 when the US returned to the gold standard at the pre-Civil War parity level. Kim (1997) argues that in the aftermath of the Civil War, both political and economic forces worked in tandem to bring the states together more closely together.

**A9** Despite this, opposition to the gold standard was widespread, particularly from farmers faced with declining real prices as deflation persisted – William Jennings Bryan<sup>3</sup> pleaded that the US should not “*crucify mankind on a cross of gold*”. The 1890s saw strong pressures to move to a bimetallic system, but the arguments were weakened as new gold discoveries were made, and mining techniques improved. As a result inflation began to pickup, easing the pressure on farmers, and the US was able to reinforce its commitment to the gold standard with the Gold Standard Act of 1900.

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<sup>1</sup> Opposition to the creation of the bank, led by Thomas Jefferson, arguably provided one of the key policies around which political parties crystallised.

<sup>2</sup> Source: Federal Reserve Bank of San Francisco, online exhibit of American currency.

<sup>3</sup> US Congressman, three-time Presidential nominee, and later, US Secretary of State.

**A10** Recurrent banking crises throughout the second half of the 19th century raised dissatisfaction with the banking structure. The discipline of the Gold Standard meant that, in the event of a domestic banking crisis or stock market crash, the money supply could not respond quickly enough to avert panics – the system was not flexible enough to inject liquidity into markets. Broaddus (1993) comments that the era was characterised by significant volatility in short-term interest rates, with short-term spikes of more than 10 percentage points not uncommon. Following a severe banking panic, the Aldrich-Vreeland Act of 1908 recommended the creation of a central banking authority, and established a commission to examine long-term solutions to banking and financial problems. This was ultimately to lead, in 1913, to the signing of the Federal Reserve Act into law by President Woodrow Wilson, which gave birth to the new central bank – the Federal Reserve (the Fed). Romer (1999) argues, “... *it is reasonable to say that monetary policy as we mean it today did not exist before World War I*” (page 17).

**A11** Yet even then, the Fed continued to evolve. Romer suggests “...*monetary policy first arose as an important cyclical force – for good or ill – in the 1920s and 1930s.*” (page 18). The early history of the Fed was marked by disputes between those who wished to centralise power with the Board of Governors of the Fed, based in Washington DC, and those who wished to see more power rest with the 12 regional banks making up the Federal Reserve System. There were accusations that monetary policy was being set for New York financiers, without consideration to the problems that caused for land-owners in the Plains. Eichengreen (1991a) argues that the evolution of the Fed in the 22 years to 1935 (and the signing of the Banking Act of that year) was a direct response to an inadequate framing of the Fed’s operations and available instruments in the 1913 Act. See Box A1 for more detail.

**A12** The responsibilities and functions of the Fed have changed over time through a number of legislative acts. The Fed began to use open-market operations widely in the 1920s, and a separate legal entity, the Federal Open Market Committee (FOMC) was established in 1935 to conduct such operations and control the money supply. Up to 1951, the Fed largely supported the fiscal policy goals of the US Treasury, as a means of financing the War effort. The Treasury-Federal Reserve Accord of 1951 formally ended this obligation, and emphasised the independence of the Fed to pursue discretionary policy. The Fed has subsequently remained strongly independent in its pursuit of its monetary policy objectives.

**A13** As an indication of the kind of economic pressures facing the early monetary union, Rockoff (2000) draws on optimal currency area theory (after Mundell 1961) to argue that, from an economic point of view, separate currencies might have been preferable for some regions during much of the 19th century:

- by world standards, the major census divisions of the US were large economies in their own right;
- they each specialised in certain goods, which made them susceptible to asymmetric shocks – the geographical diversity of the US no doubt contributed, since the early US economy relied greatly on agricultural produce that tended to specialise according to regional climates and soils etc; and

**Box A1: The early years of the Federal Reserve System<sup>a</sup>**

Eichengreen (1991a) notes that the Fed evolved considerably in its first 22 years, in response to weaknesses in its original form. The 1913 Act set up a structure around 12 district reserve banks and a central board – the Federal Reserve Board.

Initially, the individual reserve banks issued their own bank notes, which traded at fixed exchange rates against one another – and each had to be backed with gold. But the districts were left to control their own policy on discount rates by the 1913 Act, which was largely ambiguous on the relative power and roles of the district banks versus the central board. Eichengreen states that as early as 1915, two years after the inception of the Federal Reserve System, the Governors of the reserve banks complained that the Board was “*exceeding its authority in the specificity and scope of its instructions regarding discount policy*”.

The Act did not make any provisions for the co-ordination of open-market operations either (the buying and selling of securities by the central bank, generally used to control the money supply) – thus raising the possibility that reserve banks might end up bidding against one another when entering the market. Such operations were widely used by the districts, although only for the conduct of monetary policy after 1922. And it was in 1923 that the Open Market Investment Committee (OMIC) was created, under the supervision of the Board, to centralise securities purchases and sales. Even then, however, the individual reserve banks retained the right to opt out of centrally recommended operations.

Criticism of the OMIC was widespread amongst the Southern and Western banks that were not represented, particularly given the overall supervision of the central Board. In response, a 12-member committee, the Open Market Policy Committee (OMPC), representing each of the 12 reserve banks was formed. But even this still left unclear exactly who was responsible for the final say over open-market operations, and still allowed reserve banks to opt-out of OMPC operations.

But with the creation of the Federal Open Market Committee (FOMC), a body given legal standing under the 1933 Banking Act, final authority of operations was clarified and centralised in Washington with the Board. In 1935, the Board was renamed the Board of Governors of the Federal Reserve System, and was given formal responsibility for relations with foreign central banks. At the same time, the FOMC was legislated to comprise the seven members of the Board of Governors, plus 5 representatives of the reserve banks – chosen to represent the whole US, rather than simply the Northeast and Mid-West as had happened in the 1920s. And for the first time, the decisions taken by the FOMC were binding on the reserve banks, which could no longer choose which recommendations they followed.

<sup>a</sup> This summary account draws heavily on the much fuller account in Eichengreen (1991a).

- the adjustment mechanisms available to offset these shocks were limited. There was limited labour mobility between regions (particularly between the North and the South, both before and after the Civil War), while the fragmented banking system contributed to capital immobility. The Federal Government, which accounted for a relatively small share of GDP, was unable to offset regional shocks through fiscal transfers. Indeed, throughout most of the period described above, there was no clear notion of fiscal policy as a tool of economic management. Fiscal policy was decentralised first at the state level, and then at the local government level, and its role was to promote economic development through infrastructure investment and legal innovation to promote corporations and banks.

**A14** As such, there is evidence that regional shocks were severe in the early stages of the monetary union. A regional shock would often induce concerns over the solvency of the regional banking system (which was highly fragmented, it was not until the late 20th century that prohibitions on interstate banking were lifted). Balance of payments problems ensued, and bank reserves would be run down due to an inability to devalue the regional currency. These problems were frequently exacerbated, and transmitted to other regions of the monetary union, by pressure for fundamental reform of the monetary system – increasing uncertainty about the existing frameworks. Yet even in these early years, when the regions were relatively isolated from one another, Kim (1997) points out that regional incomes were quite similar – although this data excludes the slave population in the South, that would show regional per capita income significantly lower than other regions.

**A15** So despite having monetary union from the late 18th century, Kim (1997) argues that the United States only progressed from being a set of regional economies to an integrated national economy between the 19<sup>th</sup> and 20<sup>th</sup> centuries. As integration proceeded, it allowed for greater specialisation in manufacturing and agriculture, leading to stronger regional patterns of production. In addition, regional factor endowments, particularly for manufacturing resources such as energy and minerals, varied widely, contributing to regional variation in industrial structures. In turn, regional per capita income also began to diverge as a result.

**A16** This process of integration was driven by a combination of economic factors and policy by the Federal Government:

- a national transportation system began to emerge. The greatest spur to better infrastructure was provided by the states themselves, who competed to facilitate business in their locales by improving transport systems. As the federal government assumed greater prominence in the post-Civil War period, it subsidised the building of transcontinental rail. Between 1860 and 1890, national railroad mileage increased from 30,626 to 166,703;
- labour mobility began to increase. In the early 19<sup>th</sup> century, the population was largely concentrated among the eastern states. As the population grew, people began to migrate west to utilise good quality agricultural land in the plains. The greater mobility of labour continued into the 20th century; Fishback *et al.* (2001) note US census statistics which record that 11 per cent of the US population moved in the years between 1935 and 1940, and that 40 per cent of these moves crossed state lines; and
- finally, changes to institutions cemented the union. The Gold Standard Act of 1900 removed much uncertainty about monetary institutions in the US, ending controversy over the monetary standard used to underpin the currency. The Treasury began to carry out central-banking activities. At the beginning of the 20<sup>th</sup> century, it started to intervene frequently and regularly in the money market, converting what had up until that time been emergency measures into a more regular and predictable operating function. As noted previously, the formalisation of central banking was strengthened by the establishment of the Federal Reserve in 1914, giving central control over most of the banking system and providing an agency that could deliberately intervene to alter domestic money supply.

**AI7** The US faced probably its most severe economic problems in the 1930s. The stock market crashed in 1929 and a severe monetary contraction began in the nation's heartland. Several large bank failures led to a series of liquidity crises and further panic led to probably the worst banking crisis in American economic history. One third of banks disappeared within two years. The problems were, it is sometimes argued, exacerbated by the Federal Reserve policy that tightened monetary conditions, contributing to a sharp recession that prolonged the Great Depression.

#### **Box A2: The Great Depression**

The Great Depression of the late 1920s and early 1930s was the most significant 20th century event in US economic history. Driven by strong growth through the 1920s, stock market speculation had fuelled a boom in security prices, arguably creating a speculative bubble. In tandem, household debt rose, as did business liabilities. A near crash in March 1929 demonstrated the vulnerability of the markets, but monetary policy remained contractionary, even as industrial output began to slow that year. In October, the bubble began to deflate – and stock prices fell rapidly.

As they did, finance became harder to come by for business, and production began to fall. As the money supply contracted, the Federal Reserve acted to increase liquidity. But as investors shied away from equity, there was a more general move towards cash. Savings were withdrawn from banks, and the number of bank failures began to increase – slowly at first, but the numbers began to pick up significantly in the summer of 1931. As prices fell, debt-holders saw their burdens rise in real terms, and there was a growing number of defaults on domestic bank loans.

The US was not the only country that suffered. Commodity price falls spread the pain to many developing countries, while the desire to maintain fixed exchange rates caused problems for many Western economies. These commitments were to prove unsustainable. The Bank of England suspended the gold standard in September 1931 which appeared to raise the prospect of the dollar being devalued, which the Federal Reserve resisted by raising US interest rates sharply.

Expansionary policy was resumed in 1932 through open market operations, though only temporarily – some of the Federal Reserve banks began to run short of gold reserves. Meanwhile, the wave of bank failures gathered pace, reaching a peak in March 1933. Following an appeal from the New York Fed, the newly inaugurated President Roosevelt declared a 'bank holiday', shutting the banking system down, and imposing controls on foreign exchange trading as a means of giving time to devalue the dollar. Once free from the fixed exchange rate, the dollar depreciated by more than 30 per cent against sterling.

The US recovery began soon afterwards, but the impact of the slump was difficult to shake-off. Temin (1994) points out that unemployment remained in excess of 15 per cent until 1940, leading him to conclude that the Depression lasted throughout the 1930s.

**AI8** The Depression can be seen as part of a wider process of evolution in US institutions and policy, leading to policy changes that ultimately strengthened the functioning of the monetary union. Over the course of the following decades, the institutions of the US evolved in a number of ways, strengthening the monetary union. These included:

- the development of federally funded transfer programs, such as unemployment insurance, social security etc. – which, as discussed in Section 3, help regions adjust to asymmetric shocks;

- the Federal Government increased spending significantly. The New Deal<sup>4</sup> and major public works projects (the 1930s witnessed unprecedented spending on roads, dams etc) contributed to a significant rise in federal government spending. Federal government outlays grew from 3.4 per cent of GDP in 1930 to 12 per cent in 1941, immediately prior to the US becoming involved in World War 2. The later addition of Medicare<sup>5</sup> and other ‘Great Society’<sup>6</sup> programs in the 1960s cemented this shift, offsetting a decline in defence spending in the early 1970s; Federal Government outlays in 2002 were estimated to be just under 20 per cent of GDP<sup>7</sup>;
- spending under many of the New Deal programs varied state by state – spending per capita was some three to four times higher in the West than in many Southern States. Fishback *et al.* (2001) suggest that variation in program spending had a significant effect on migration in some cases, public works spending being one program that they find contributed significantly to migration into the county in which the money was spent. Migration is also likely to reflect the fact that widespread job losses due to the Depression will have reduced economic ties to their original home county/state for many people;
- the introduction of a federal deposit insurance system in 1934, that appears to have stopped the recurrent problem of regional banking crises. Prior to this, weak banking systems often caused asymmetric real shocks to develop into a nation-wide banking panic. Following the ‘bank holiday’ of 1933, the Federal Deposit Insurance Corporation (FDIC) was set up as an independent government corporation, insuring deposits against bank failure and regulating some aspects of the banking system. As a means of restoring public confidence in the system the FDIC has been largely successful – bank failures in the US have, except in the late 1980s and early 1990s, become a rarity;
- the enabling of the Federal Reserve System to function as the lender of last resort, allowing monetary policy to react more quickly to economic downturns and contain regional banking problems;

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<sup>4</sup> Domestic policy programme of President Franklin D. Roosevelt, so-called because of Roosevelt’s promise of a “a new deal for the American people” when accepting the 1932 Presidential nomination. Under the New Deal, various employment programmes were legislated for, including the Civilian Conservation Corps (providing national conservation work) and the Public Works Administration (providing employment in construction of highways and other infrastructure, and public buildings).

<sup>5</sup> Scheme providing medical benefits and insurance to those over 65 or with long-term disabilities.

<sup>6</sup> Slogan used in 1965 by President Lyndon Johnson to describe his legislative program of national reform. In his first State of the Union address, Johnson described his vision of a “Great Society” that would include a “war on poverty” and federal support for education, medical care for the elderly, and legal protection for blacks deprived of voting rights by state regulations. He also proposed a new department of housing and urban development to co-ordinate federal housing projects. The programme represented the largest number of legislative programs since Roosevelt’s New Deal.

<sup>7</sup> Data from “The Budget for Fiscal Year 2003 – Historical Tables” Budget of the United States Government, available from <http://www.whitehouse.gov/omb/budget/fy2003/>

- the introduction of a mortgage insurance programme, whereby private lender's decisions could be insured by the Federal Housing Agency (FHA) – a federal government-backed organisation which began underwriting loans for repair and modernisation in 1934, and for new homes in 1935. The aim of the scheme was to stimulate recovery in the building/construction sector, but had the longer-term impact of fundamentally changing elements of mortgage financing – by allowing smaller down payments on property, and promoting the use of long-term loans. Fishback *et al.* (2001) suggest that the FHA program helped encourage a nation-wide housing market, from a relatively illiquid state in the early 1930s, by subsidising interest rates (the government implicitly assumed some of the default risk) and reducing some of the liquidity constraints on mortgage financing. Moreover, because the construction sector witnessed some of the highest levels of unemployment during the Depression, the boost to mortgage and housing markets provided by the FHA had significant effects, according to Fishback *et al.*, on inter-state migration and labour mobility;<sup>8</sup> and
- federal labour legislation was implemented, in the form of minimum wages, regulation of hours and conditions of work.

**A19** The economic consequences of the Depression were severe. Despite the developments described above, the pressures on the US monetary union were immense, particularly since the impact of the Depression was far from even across the country. Nonetheless, the developments enacted by the Federal Government serve as an example of how the US monetary union evolved to face specific problems and difficulties.

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<sup>8</sup> Fannie Mae, a corporation that packages individual mortgages into securities before selling on to investors, was formed as part of the FHA in 1938. Congress set up the Federal Home Loan Mortgage Corporation, Freddie Mac, for similar purposes in 1970 – to stabilise national mortgage markets in the face of interest rates that varied widely across the country. Both organisations now exist as publicly traded corporations.

**B1** This annex addresses fiscal stabilisation in the US, with reference to fiscal federalism – the allocation of fiscal policy authority among different levels of government. The aims of fiscal policy can essentially be broken down into three objectives:

- public policy objectives, such as the provision of public services;
- income stabilisation, in the face of temporary shocks to output; and
- income redistribution, from richer to poorer regions of a country.

**B2** Both stabilisation and redistribution are ways in which fiscal policy *insures* regions against shocks. This annex considers the ways in which fiscal policy provides insurance, examining evidence for the scale of such insurance in the US compared with other countries.

## Fiscal federalism in theory

**B3** From time to time, particular industrial sectors or regions of countries will be hit by shocks. Some will be temporary, manifested in a sudden, temporary drop in demand for that region's production; others will have a more permanent impact, such as supply shocks due to rapid changes in technology, that cause a permanent fall in output in the region.

**B4** Temporary shocks to income can be stabilised by borrowing during a downturn. Permanent shocks necessitate a structural adjustment; for a region whose production is no longer demanded because it is outdated, borrowing and insurance cannot solve the underlying problem that the region needs to find new areas of production and specialisms. That said, insurance may still provide temporary support, helping smooth the adjustment to a new equilibrium.

**B5** Within a currency area, monetary policy is available as one tool to respond to shocks whose impact are felt broadly symmetrically by all regions. Fiscal policy may also carry out this function. For instance, the national or federal government can borrow money to stabilise income in the face of a temporary, negative shock. Governments can borrow to finance spending even as tax revenues fall, with debts repaid when growth returns to potential as the effect of the shock dissipates. In effect, the government is borrowing against future tax revenues.

**Different levels of government** **B6** When comparing fiscal policy among a group of countries, it is important to note that the existence of different levels of government affects the range of possibilities for fiscal stabilisation:

**B7** With a single tier of government, **the national or federal** government can provide:

- inter-temporal insurance, by varying its borrowing over the economic cycle; and
- inter-regional insurance, by net taxes/transfers flowing between component regions, either through the automatic stabilisers<sup>1</sup> or discretionary policy.

**B8** With some fiscal autonomy at a **regional** level, a regional government may be able to provide insurance independently of the national or federal government through regional inter-temporal insurance.

**B9** This implies that a range of possibilities exist through which multi-level governments can combine to provide fiscal stabilisation:

- at one extreme, fiscal policy may be highly centralised, working almost entirely through national or federal government;
- at the other extreme, fiscal policy is undertaken at a regional level, with little or no fiscal insurance provided at the national or federal level (as in the EU, where fiscal policy remains the responsibility of Member States); and
- in between, there is a range of intermediate models of fiscal federalism, where power is shared more equally between regional and national/federal levels of government (for example, as in Germany and Canada).

**B10** The choice of which level of government is most appropriate for the conduct of fiscal policy is a political economy issue, closely tied to preferences over the provision of public goods and services. Discussion of this point is beyond the scope of this study. But it is important here insofar as it suggests that institutional factors must be considered when comparing the impact of fiscal policies across countries. This study shows that the US is arguably closest to the first, centralised form of fiscal federation.

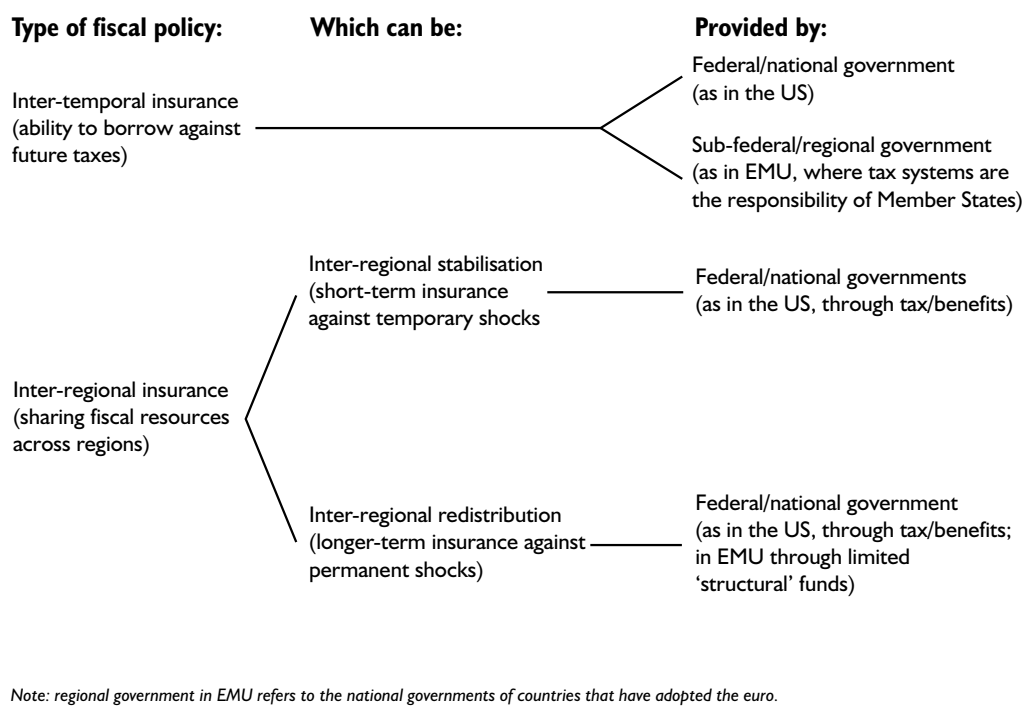
**B11** This annex begins by describing in more detail the way in which fiscal policy can act to offset the impact of shocks. Drawing on this analysis, the study then examines the evidence comparing the degree of fiscal stabilisation in the US with international examples. In particular, it focuses on the differences in institutional frameworks between the US and other monetary unions, such as Canada and the euro area, where fiscal policy is more decentralised.

**B12** Chart B.1 provides a summary of the different ways in which fiscal policy can provide insurance against shocks, illustrating how insurance can be provided at different levels of government. The chart also draws on the empirical evidence summarised later in this annex to provide a stylised comparison of the difference between models of fiscal federalism in the US and the euro area.

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<sup>1</sup> Automatic stabilisers are a by-product of the tax and benefit system. They describe the tendency for private sector payments to the Government to fall and receipts from Government to rise when private sector income falls.

Chart B.I: Modelling fiscal federalism



## Fiscal stabilisation – policy options

**Inter-temporal insurance B13** Inter-temporal insurance is a form of insurance frequently carried out by individual households who borrow against future income. But it is also a function available to the national or federal government, and may be available to individual regions if local or sub-federal governments have a degree of fiscal autonomy. Thus, in the face of an asymmetric shock affecting only one state or region, local government may be able to stabilise the local economy in this way.

**Inter-regional insurance B14** Fiscal policy also provides a policy tool against shocks that affect individual regions, by sharing the burden with other regions within a country or monetary union. This transfer of resources occurs naturally through a tax and benefit system set at the federal level of government, and may be quite limited depending on how the system is financed by different levels of government. In response to fall in demand for output in a given region, less tax is paid to the federal or national government because of the lower level of economic activity, while a higher level of benefits are paid to the region if unemployment increases. A transfer of resources thus occurs between the regions of the country, helping to cushion the initial impact of the shock. Automatic effects can be supplemented by discretionary action. In the event of a permanent shock, resources may continue to be reallocated from richer to poorer regions of the country for sustained periods.

**B15** Thus, inter-regional insurance can be classified according to the type of shock it responds to and its budgetary implications. These types of insurance are discussed in greater detail below:

- **inter-regional stabilisation:** constituent regions are insured against *temporary* asymmetric shocks, thereby helping to stabilise consumption across the union. Since the shock is temporary, the insurance is also only temporary;

- **inter-regional redistribution:** in the face of *permanent* shocks, the country commits to reallocate resources to regions of the union that are judged, for example on an output per capita basis, to be relatively poor. The aim is to compensate for longer-term structural differences in productivity levels or invest to address these differences. Since large variations in relative output and income levels will be determined by structural, rather than cyclical factors, redistribution may be a long-term commitment.

**Inter-regional stabilisation B16** Inter-regional stabilisation acts as a system of insurance in which regions within a monetary union are protected against temporary shocks. In the event that one region suffers a downturn in economic activity, it continues to call on spending from the supra-national, or federal, level of government, even while tax revenues in that region may have fallen. Thus, the region effectively borrows from other members of the union, rather than having the entire burden of the borrowing fall upon its own taxpayers. Since there is no *a priori* reason to expect one region to suffer a greater number of asymmetric shocks than its neighbours in the long run, inter-regional stabilisation need not involve any long-term reallocation of resources from relatively rich to relatively poor areas.

**Inter-regional redistribution B17** An alternative form of insurance is redistribution – essentially, the transfer of resources from richer to poorer areas of a monetary union, which may, in the presence of deep-rooted structural problems, continue for some period of time. Redistribution may be justified insofar as it seeks to address a lack of development, perhaps because market failure means that structural adjustment is made more difficult – for example the public financing of infrastructure in a deprived area that would otherwise not be provided by the market. There may also be a desire to prevent rapid out-migration from a relatively poor region, because of large social costs that this might incur, an argument that may be particularly pertinent in areas where geographic or climatic factors make long-term convergence in productivity levels difficult.

**B18** However, even well-intentioned redistribution may act against regional economic performance. Redistribution may reduce the incentives for poorer regions to reform structurally (e.g. through greater variation in regional wage differentials), effectively postponing what may be essential changes to the regional economy if real convergence in productivity levels and incomes is to take place.

## Macroeconomic policy and stabilisation in the US

**B19** The paper has identified several ways in which fiscal policy might provide adjustment to shocks in a monetary union:

- inter-temporal insurance by the federal/national government;
- inter-temporal insurance by sub-federal or regional governments;
- inter-regional stabilisation through the federal/national government tax and benefits system; and
- inter-regional redistribution between states by the federal/national government.

**B20** The focus of this section is to consider how fiscal policy operates in the US; specifically, the degree to which fiscal policy provides stabilisation against shocks through each of the channels described above. As with other countries, fiscal policy in the US only partially stabilises against the impact of a shock. Despite this, the impact varies across countries both in terms of the aggregate level of stabilisation, and (as noted previously) the level of government at which it is provided.

### Inter-temporal insurance by the federal government

**B21** The US Federal Government, like almost all governments, borrows in financial markets. It is difficult to identify a specific counter-cyclical impact because as well as changes in the fiscal stance through the normal functioning of the automatic stabilisers, the government can undertake discretionary stabilisation and, of course, its normal public policy functions.

**B22** Automatic stabilisation provided to the US economy by the federal government through the tax and benefit system is smaller than in many other industrialised economies, in part because of the smaller share of the economy accounted for by the public sector – in 1999, for example, structural primary expenditure in the US was around 26 per cent of GDP, compared with around 35 per cent in the UK and around 45 per cent in France. So it is not surprising that the OECD (2000) find that among member economies, the US fiscal position was least responsive to changes in the economic cycle. Nonetheless, the 20th century saw an increase in the importance of the automatic stabilisers in the US as federal spending as a percentage of GDP increased (see Annex A on the history of the US monetary union for more detail).

**B23** Evidence from Cohen and Follette (2000) and Auerbach and Feenberg (2000) suggests that the US automatic stabilisers offset only around 8-10 per cent of a shock to aggregate output.

**B24** The government may also undertake discretionary stabilisation. The OECD (2000) notes that in the early 1990s recession, fiscal policy supported and reinforced the automatic stabilisers; while the automatic stabilisers caused the fiscal balance to deteriorate by 1.1 per cent of GDP, discretionary loosening caused a further deterioration, also of 1.1 per cent of GDP.

## Inter-temporal insurance by sub-federal/regional governments

**B25** As with the federal government, the size of the public sector in each US state is likely to affect the degree of stabilisation provided by automatic changes in tax revenues. Fatás and Mihov (1999) find that states with larger tax to GDP ratios exhibit less volatile business cycles; a high level of personal taxes, in particular, is associated with lower volatility in output.

**B26** As noted in the main body of this study, individual state governments in the US make almost no effort to engage in inter-temporal insurance of income by using their budgets as a stabilisation tool. In fact, almost without exception, the states limit the operation and impact of the automatic stabilisers through balanced budget requirements.

**B27** Every state but Vermont has the requirement that the budget should be balanced, although the precise definition of the 'balanced budget' requirement varies from state to state. In some cases, it may mean that the Governor merely has to submit a balanced budget to the legislature; in others, that it must be balanced upon approval. Certain states allow the self-imposed fiscal rule to be relaxed if it is to finance certain exceptional items; other rules vary by the type of funds to which they apply. There is, therefore, little harmonisation of fiscal rules at the state level, and where restrictive budget rules are implemented, states may still be able to borrow by devolving debt issuance to the local (municipal) level of government.

**B28** In recent years, many states began to set aside 'rainy-day funds' – a form of reserve account built up during the expansion of the 1990s, with the aim of building up a defence against a downturn in revenues and increasing liabilities associated with a cyclical downturn. By the end of the fiscal year 2001 (end September 2001), the National Association of State Budget Officers estimated that states had built up reserve balances totalling 7.7 per cent of annual expenditures, just under 3 percentage points higher than in the period preceding the recession of the early 1990s (Centre on Budget and Policy Priorities, CBPP, 2002).

**B29** However, the size of the funds varies widely – from 10.2 per cent of expenditure in New Mexico to zero in other states, such as California and Colorado. States such as Maine, Missouri, Ohio and Kentucky have used their funds to balance a shortfall in their budgets for the fiscal year 2002. But other states with funds available have not always used them. The Center on Budget and Public Policy Priorities (CBPP 2002) reports that in December 2001, the state of Florida enacted around \$1 billion worth of budget cuts without drawing down any of the \$941 million available in the rainy-day fund. Section 3 notes anecdotal evidence that political pressure to maintain budget discipline and concerns that state finances could worsen further, may have restricted the ability or desire of some state legislatures to use the accumulated surpluses. This latter point refers to the fact that this kind of intertemporal smoothing is only effective against non-persistent shocks.

**B30** Thus, US states generally choose not to undertake counter-cyclical stabilisation. This contrasts with Canada, a more devolved federation than the US, where federal taxes comprise around half the share of income that they do in the US (Bayoumi and Masson, 1995). Provinces have correspondingly greater autonomy over fiscal policy than their US counterparts, which is available to use for counter-cyclical stabilisation.

**B31** It also contrasts sharply with the euro area, where tax and spending decisions remain the responsibility of individual Member States, subject to the avoidance of excessive deficits. Each Member State retains the ability to use counter-cyclical fiscal policy in the event of a temporary shock to output, illustrative of a more decentralised fiscal system than in the US.

## Inter-regional stabilisation

**B32** Inter-regional stabilisation to offset temporary shocks can arise through two main channels:

- an explicit system of mutual insurance between regions or states to pool revenues, perhaps paying into a fund in good times and withdrawing when the region is hit by a negative asymmetric shock, such as a fall in demand for that region's output. Such a system could be administered at a federal level, or by states independent of the federal government (although in practice this seems less likely and so for simplicity is excluded from Chart B.1), and may result in significantly larger transfers of income than those provided simply through the tax/benefit system; and
- the automatic stabilisation property of the tax and benefit system. Asymmetric shocks cause a drop in the taxes paid by one region, at the same time as benefits (or transfer payments) to the region increase. Since the overall system is funded by the federal US Government, an asymmetric shock necessarily implies that resources are diverted from faster to slower growing regions.

**B33** The US operates no explicit system of revenue sharing between states – though it has done so in the past, and there are occasional calls for its reintroduction. The 1972 State and Local Fiscal Assistance Act authorised the creation of the Office of Revenue Sharing as a bureau of the US Treasury Department, and the foundation of a revenue sharing programme between states that existed until 1986. The revenues under this system were paid to states on the basis of complex formulae relating to (among other factors) population, urbanised population, 'tax effort'<sup>2</sup> and per capita income. Thus, while some elements of revenue may have been affected by cyclical factors, not all were – and the system functioned more generally as a means of disbursing federal funds to states.

**B34** In contrast, the evidence suggests that the US federal tax and benefit system does work to provide temporary inter-regional stabilisation against shocks. It is this automatic stabiliser property of the tax and benefit system that appears to be captured by most of the large number of studies examining the degree of fiscal insurance in the US and other countries, dating from the MacDougall Report (European Commission, 1977). There are a number of limitations with the majority of these studies,<sup>3</sup> not least that it is often difficult to distinguish the automatic inter-regional stabilisation caused by the federal tax and benefit system from:

- the inter-temporal insurance provided by federal government borrowing; and
- the redistributive elements of fiscal policy – a key distinction since, as noted above, redistribution is not necessary for the successful functioning of a monetary union.

**B35** Table B.1 summarises the results of the key studies on the US, distinguishing between stabilisation and redistribution where possible. The key points are:

- most studies find that fiscal insurance plays at best a small role in offsetting the effect of asymmetric shocks. Von Hagen (1992) and Obstfeld and Peri (1998) calculate that 10 per cent of a change in state income is offset by fiscal insurance. Fatás (1998) also finds that the effect of insurance is 11 per cent, similar to the majority of other studies;

<sup>2</sup> The net amount of tax collections divided by aggregate personal income.

<sup>3</sup> von Hagen (1992) and Fatás (1998) provide a more thorough discussion of the limits to methodologies employed in many of these studies.

- other approaches, such as those taken by Melitz and Zumer (1998) and Sørensen and Yosha (1997) find slightly higher results. Sørensen and Yosha also find that the share of state income insured federally increased between the 1960s and 1970s, before stabilising;
- the analysis in the MacDougall Report (European Commission, 1977) found overall that the US system reduced income differences by 28 per cent, broadly similar to Germany, but significantly less than in other European countries (36 per cent within the UK, 47 per cent within Italy and 54 per cent within France); and
- Sala-i-Martin and Sachs (1991) offer a higher estimate of between 33 per cent and 50 per cent, despite specifically excluding large one-off transfers from their estimates. But von Hagen (1998) argues that this, and the MacDougall Report, fail to distinguish adequately between stabilisation and redistribution.

**B36** The evidence suggests that the stabilisation effect provided by the federal tax and benefit system acts to offset perhaps around 15 per cent of shocks to output. But Fatas (1998) finds that the degree of insurance varies widely by state – from a high of 28 per cent in North Dakota to just over 3 per cent in Virginia – with an average for the US as a whole of some 11 per cent.

**Table B.1: Fiscal stabilisation and redistribution in the US**

	Redistribution	Stabilisation
von Hagen (1992)	47	10
Bayoumi and Masson (1995)	22	30
Fatás (1998)		11
Asdrubali <i>et al.</i> (1996)		13
Sørensen and Yosha (1997)		15
Athanasoulis and van Wincoop (2001)	20	10
Obstfeld and Peri (1998)	19	10
Melitz and Zumer (1998)	16	12 to 20
European Commission (1977)		28
Sala-i-Martin and Sachs (1991)		33 to 50

*Note: Each result represents the percentage offset through the US federal fiscal system for a state suffering a shock to income/output.*

**B37** International comparisons are provided in a number of papers. Pisani-Ferry *et al.* (1993), for example, find that insurance offsets around 17 per cent of a shock in the US, compared to 37 per cent in France and over 34 per cent in Germany. Goodhart and Smith (1993) estimate a 21 per cent offset in the UK (as do Melitz and Zumer (1998)). For Canada, studies such as Bayoumi and Masson (1995), Melitz and Zumer (1998) and Obstfeld and Peri (1998) agree that roughly 15 per cent of shocks are offset through insurance.

**B38** In contrast, the current EU-level system provides very little insurance against shocks – Sala-i-Martin and Sachs (1991), for example, found that the system for raising EU budget revenues (“own resources”) offset only 0.5 per cent of shocks to output, compared with 34 per cent in the US. But this is at an EU level only, and ignores the impact of national fiscal policy at the Member State level.

**B39** The broad conclusion of this evidence, despite the empirical difficulties noted above, is that the degree of stabilisation provided in the US is not large and is no greater, and probably less, than that which is already provided by individual nation states in Europe.

## Inter-regional redistribution between states

**B40** Redistribution, as noted above, may be used as a means of transferring resources from relatively rich to relatively poor regions of a country or monetary union. Rather than aiming to stabilise output against temporary shocks, redistribution is usually motivated by one of two factors:

- an objective to equalise incomes, in the face of large productivity differences; or
- investing in order to address long-standing structural problems.

**B41** In the US, redistribution is provided through the tax and benefit system in a similar way to stabilisation. The distinction between stabilisation and redistribution arises, as noted previously, because of differences in the underlying shocks. Insofar as the shocks are temporary, no long-term redistribution takes place. But where shocks have a permanent impact on individual regions, the system can result in prolonged, long-term redistribution from richer to poorer regions.

**B42** This distinction underpins the empirical difficulties discussed earlier, associated with estimating the insurance and redistribution impact of US federal fiscal policy. Nonetheless, studies that identify a specific redistributive impact in the US suggest that it may, if anything, be larger than the insurance channel. Estimates of between 13 and 22 per cent of a shock offset in this way are given by Melitz and Zumer (1998), Obstfeld and Peri (1998), Athanasoulis and Van Wincoop (2001), Bayoumi and Masson (1995) and Goodhart and Smith (1993).

**B43** The US Federal Government is also able to provide specific targeted assistance to regions suffering particular hardship. For example, the Appalachian Regional Development Act of 1965 was a direct response to a lengthy depression in West Virginia and eleven other states. Of over \$1 billion approved under the Act, funding was provided for infrastructure improvements, education, timber production and the closure of old mines.

**B44** The Canadian Government, in contrast, is constitutionally mandated to engage in regional redistribution in this way, as a means of ensuring that each province is able to provide a broadly similar level of public services to its population as other regions, for a comparable level of tax.<sup>4</sup> The current system of redistribution at the EU-level in Europe is extremely limited in comparison to both the US and Canada, occurring through structural fund programmes.<sup>5</sup> The EU budget is small in comparison with national spending in Member States – at around 1 per cent of EU GDP, compared with an average of around 50 per cent of GDP in the Member States.

**B45** This is reflected in the evidence, provided by both Bayoumi and Masson (1995) and Obstfeld and Peri (1998), that redistribution in Canada is greater than in the US. Melitz and Zumer (1998) also find that redistribution from richer to poorer regions is greater in the UK (26 per cent) and France (38 per cent).

<sup>4</sup> According to Section 36(2) of the Constitution Act (1982): “Parliament and the government of Canada are committed to the principle of making equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation.”

<sup>5</sup> At present, there are four Structural Funds through which the European Union grants financial assistance to resolve structural economic and social problems, including the European Regional Development Funds (ERDF), which promote economic and social cohesion within the Union through the reduction of imbalances between regions or social groups. In addition, the EU supports Member States whose GDP is less than 90 per cent of the European average through the Cohesion Fund, which finances projects linked to the environment and trans-European transport systems.

**B46** Thus, even though the redistribution channel is found to dominate fiscal insurance in the US, the evidence suggests it is lower than in Canada and some European countries.

### Other evidence

**B47** The degree of stabilisation and regional assistance provided by different channels of fiscal policy is often difficult to identify in the face of different kinds of shocks and cross-country differences in institutions and fiscal systems.

**B48** In the preceding analysis, this annex has identified the individual channels through which fiscal insurance is provided in the US. As noted above, the empirical evidence frequently finds it difficult to separate the different forms of insurance – for example, inter-regional stabilisation from inter-regional redistribution. Those papers which, according to von Hagen (1992) and Fatás (1998), fail to distinguish between two or more of the channels, are worth noting here. In some senses, at least, this may facilitate more direct comparisons with the stabilisation provided by other nations, such as European countries, where the mix of unemployment benefits and discretionary stabilisation may vary widely from country to country:

- the MacDougall Report (European Commission, 1977) is criticised by von Hagen for failing to distinguish between redistribution and stabilisation – they estimate that insurance provided by the US Federal Government offset some 28 per cent of an asymmetric shock. But this is lower than their estimates for Canada (32 per cent), France (54 per cent), Germany (29 per cent) or Italy (47 per cent);
- Bayoumi and Masson (1995) are criticised by Fatás (1998) for failing to separate inter-temporal insurance by the federal government from inter-regional stabilisation. As set out in Antonio Fatás' contribution to the EMU study *Submissions on EMU from leading academics*: “When a state suffers a recession, and the fall in its tax revenues is not compensated by revenue increases coming from other states, then the federal budget will run a deficit that will need to be paid in the future by all states. As a result, the state in recession does not benefit as much as indicated by the smoothing of disposable income and, moreover, the other states suffer because of the future tax payments;”
- but for the purposes of this analysis, this may help in a comparison with other countries, for the reason given above. Bayoumi and Masson estimate that the degree of insurance is higher in the US than in Canada (30 per cent and 17 per cent respectively). Moreover, using data from 5 EU countries including the UK, they find that the fiscal system reduces fluctuations by an average of 31 per cent in these countries, comparable with that in the US. Thus, they argue that the stabilisation provided by the US Federal Government, through the combined effect of tax and benefits and inter-temporal borrowing, is broadly equivalent to that which is provided already by national governments within the EU.

### Conclusions

**B49** Despite the empirical difficulties associated with this analysis, a number of conclusions can be drawn about the system of fiscal federalism in the US and how it compares internationally.

**B50** In this context, institutional differences between the US and other countries and monetary unions must be borne in mind. Fiscal policy in the EU is significantly more decentralised (to a Member State level) than in the US, where most fiscal authority remains at the federal level. This means that when comparing the degree of insurance provided by fiscal policy under each system, comparators vary – inter-temporal and inter-regional insurance, for example, are provided at a Member State level within the EU and euro area, and at a federal level in the US. Barry Eichengreen’s contribution to the EMU study *Submissions on EMU from leading academics* argues that many early studies of EMU and fiscal federalism “...underplayed the importance of national ... fiscal policies, which have more capacity [than in other monetary unions such as the US] to do good ... in Europe because fiscal policy is so much more decentralised there.”

**B51** With this in mind, the following conclusions can be drawn from the evidence. In terms of inter-temporal insurance:

- the US Federal Government provides less inter-temporal automatic stabilisation to shocks than other OECD economies (including within EU Member States), though it can compensate for this through discretionary policy changes; and
- state governments in the US do not conduct counter-cyclical policy (inter-temporal stabilisation) to stabilise against shocks.

**B52** In terms of inter-regional stabilisation:

- the federal tax and benefit system in the US provides some inter-regional insurance against asymmetric shocks – though no more than is already provided, on average, at a Member State level in the EU; and
- there is no system of explicit counter-cyclical revenue-sharing in the US.

**B53** Finally, in terms of inter-regional redistribution:

- the federal tax and benefit system in the US provides some redistribution from richer to poorer regions, though less than in Canada and within some European countries.

**B54** Overall, the empirical evidence suggests that the degree of insurance provided by national fiscal systems within the euro area already at least matches that provided by the federal government in the US. While the US provides a greater degree of stabilisation through fiscal policy than is provided (at the Community level) by the European Union, this tends to ignore the fact that the Member States of the EU have correspondingly greater freedom to run independent fiscal policies than US states. Since asymmetric shocks tend to occur at a regional or sectoral level, the difference, on stabilisation grounds, between providing fiscal insurance at a federal level or (as in the euro area) the Member State level should be limited.<sup>6</sup> Indeed, in his contribution to the EMU study *Submissions on EMU by leading academics* Antonio Fatás argues that “the implementation costs [of a European fiscal federation] are too large to compensate for the small potential benefits”.

**B55** That said, it does imply a difference in distributional terms, i.e. who pays for the insurance. When inter-regional insurance is provided at a federal level, the burden of paying may fall on taxpayers in all regions of the monetary union; on the other hand, if it is provided at a regional level, the burden falls only on the taxpayers in that region. In this way, taxpayers in euro area countries are (structural funds apart) only bearing the burden of insurance in their own country.

<sup>6</sup> Although the difference in institutional design may be important in relation to questions of political economy and/or efficiency. Both are beyond the scope of this study.

