

University of Groningen

Perspectives on productivity and business cycles in Europe

Inklaar, R.

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2006

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Inklaar, R. (2006). *Perspectives on productivity and business cycles in Europe: Contributions of the Euro and the Lisbon agenda to growth*. [Thesis fully internal (DIV), University of Groningen]. s.n.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Chapter 1 Introduction

1.1 Europe's challenges

As the European Union (EU) struggles to maintain its political momentum in the face of growing popular resentment against further integration, its economic model is also challenged. Its two most important economic projects are the new common currency, the euro, and the Lisbon agenda to stimulate the competitiveness of European economies. However, both projects face headwinds. The long-run sustainability of the euro is by no means guaranteed, which is exemplified by the resistance of France and Germany to the Stability and Growth Pact, the fiscal pillar of the Economic and Monetary Union (EMU). In addition, European competitiveness has slipped to such an extent compared to resurgent growth in the United States that the European Commission (2004) speaks of Europe's 'structural productivity problem.'

In this study, I analyze a number of aspects of these two major policy projects. These analyses show that the challenges to these programs are related in various ways. The key policy prescription is that the flexibility of European economies should be enhanced, specifically by reducing regulatory burdens, stimulating (cross-border) movement of labour and freeing up trade in services. These measures will help in responding to economic shocks, whether these shocks are cyclical disturbances or technological opportunities. The United States represents an example, where both adverse local cyclical developments are absorbed without too much economic pain as well as new technologies successfully exploited.

The competitiveness of European economies, and specifically the rate of productivity growth, is important to ensure a high standard of living. In the short run, a higher income per capita can also be realized through a higher employment rate, but while the employment rate cannot increase indefinitely, no such limits are apparent for productivity. This issue is set to become more important in the upcoming decades as 'baby boomers' retire and working-age populations shrink in most European countries.

Strong productivity growth can ensure that pension systems remain solvent without a decline in living standards for current workers.

Much commentary currently focuses on the spectacular growth performance of India and China, with cheap manufactured goods from China and outsourced ICT services from India threatening parts of the European and American economies. However, the immediate impact should not be exaggerated. In terms of income and productivity levels these countries still lag Europe and the U.S. by decades, so the rise of China and India mostly stimulates a more efficient division of labour.¹ When confronted with cheap imports, the most sustainable strategy is to compete on quality and innovativeness because the closure of Europe's borders against those imports provides only temporary relief at best, or worse, slows down structural improvement even further. A more immediate challenge for Europe is the resurgence of U.S. productivity growth. Whereas the average productivity level of the European Union was at the same level as the U.S. around the mid-1990s, a new productivity gap has opened up since. The strong performance of the American economy over the past decade stands in stark contrast to the lower GDP growth rates and higher levels of inactivity in many European economies. This suggests that Europe's competitive and innovative capabilities are lacking.

Despite these grudges against Europe's economies, it should be stressed that the European integration process of the past half century has been a remarkable success. Although still incomplete (particularly in the area of services), the realization of an internal market has created one of the largest economic free trade areas in the world, providing an enormous potential for growth and productivity gains. The Lisbon agenda is essentially meant to realize this potential by focusing on economic reforms, more jobs and innovation.

The other main economic project is the adoption of a common currency by twelve European countries. An important reason for adopting the euro has been to support further economic integration and growth within the euro area. In addition it was meant to provide a framework for a more robust fiscal and monetary regime in an area that is so

¹ GDP per person engaged in China and India is between ten and twenty percent of levels seen in Europe and the U.S. Even at current growth rates, it will take until at least 2040 before productivity levels would be at similar levels.

strongly integrated. As such, it represents an experiment of a unique scale in modern times. Still it is by no means certain that this project will ultimately turn out to be a success. For example, while Germany was one of the most vocal advocates of adopting strict fiscal rules to complement the common monetary policy, it has been among the first countries to break those rules. Even if the euro delivers benefits by way of greater competitiveness, there is a risk that these gains are outweighed by the costs of a common monetary policy.² Upon joining the euro area, the member countries surrendered their monetary policy and thereby an instrument to dampen the effects of recessions. Unless recessions occur at the same time in all member countries, monetary policy will not be suitable for all countries.

This study analyzes the challenges Europe faces in these two economic projects and the implications for European competitiveness from a number of different perspectives.³ The next section discusses the prospects for the euro and the effects of the heterogeneity of the euro area, setting the stage for Chapters 2 and 3. Their main goal is to determine whether the costs of the common currency may become unsustainable in the future. Section 1.3 presents recent productivity developments and introduces Chapters 4 and 5. These chapters evaluate the importance of new information and communication technologies (ICT) diffusion and of cyclical factors in explaining the productivity growth gap with the United States. Through the analysis of Europe's productivity problem, these chapters suggest ways in which the goals of the Lisbon agenda could be achieved. Finally, Section 1.4 sketches the agenda for reform based on the findings of this study as well as other research and brings the two topics together in an integral fashion.

1.2 The costs of the euro and variations in business cycles

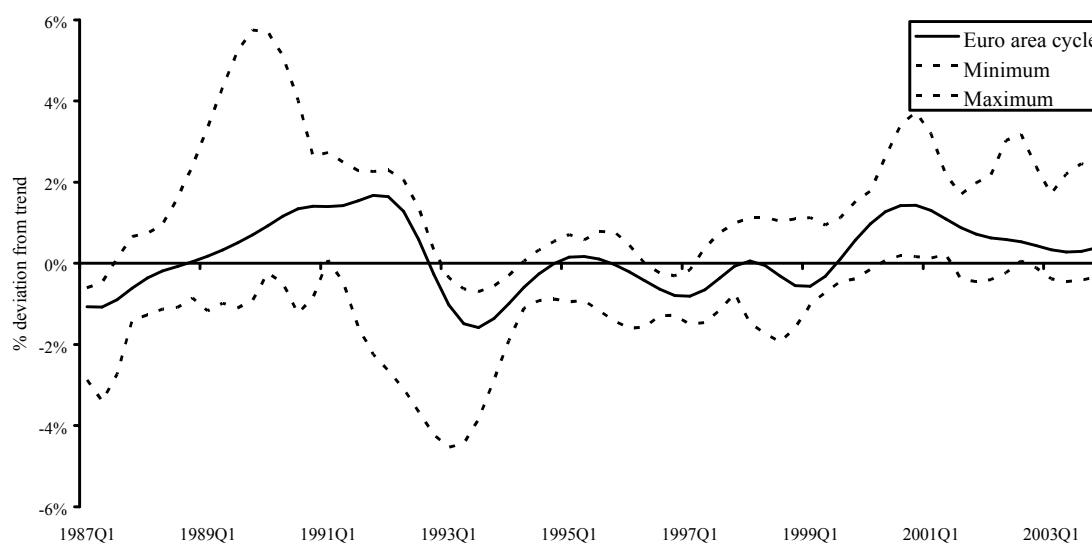
The most important consequence of the adoption of a common currency in the euro area is that monetary policy is the same for all member countries. In setting this policy, the European Central Bank (ECB) should only respond to economic developments in the area as a whole, but this may not be suitable for all countries in the monetary union. If

² Some would argue that the euro was introduced mainly for political reasons. Nevertheless, the costs of the euro may come to outweigh the combined economic and political benefits.

³ This book deals exclusively with the 15 EU member states from before the accession of ten new member countries in May 2004. Europe and EU-15 will be used interchangeably.

business cycles vary substantially across countries within the euro area, monetary policy will be too accommodating for some countries, and too strict for others.⁴ This issue is not just of academic interest as research by Nitsch (2004) has shown that inflation differences have led to the dissolution of currency unions in the past, and these inflation differences are (to a certain extent) related to differences in business cycles.

Figure 1.1 Euro area cycle and the range of cycles for euro area countries, 1987-2003



Source: OECD Quarterly National Accounts, supplemented with Eurostat and national data, see Table 1.1

Notes: Business cycle is estimated as the Baxter-King (1999) band pass filtered log of quarterly GDP of a synthetic euro area and each of the euro area countries, estimated over the period 1970-2003. Minimum is the smallest value for filtered GDP in any of the euro area countries in a specific quarter Maximum is the largest value for any of the countries.

Figure 1.1 illustrates this problem by showing output relative to trend for the euro area for the period 1987-2003.⁵ As the figure shows, periods where output was above trend have alternated with periods of below-trend output. Periods where output is substantially below trend, such as in the early 1990s, are commonly referred to as recessions.⁶ In addition to the euro area cycle, the highest and lowest output of the individual countries relative to their own trend is also shown. This makes clear that at

⁴ Monetary policy can have a short-run effect on economic activity if there are frictions in the economy such as sticky prices (e.g. Calvo, 1983) or sticky information (e.g. Mankiw and Reis, 2002).

⁵ The business cycle estimates are based on quarterly GDP series filtered using a band pass filter. The GDP series are mostly drawn from the OECD's Quarterly National Accounts publication, supplemented by national sources. The band pass filter used is described in Baxter and King (1999) and discussed in further detail in Chapter 3.

⁶ See Chapter 2 for more details on defining recessions.

nearly any point in time, output in some countries is above trend, while in others it is below trend. In other words, a very heterogeneous set of countries has adopted a common currency in 1999. In the short run, this may not be a problem for monetary policy decisions since the ECB only needs to worry about economic developments in the euro area as a whole. In the long run though, it will be difficult for a country to be part of a monetary union if its business cycle is not (broadly) in line with that of other member countries.

A problem that does surface in the short run is that GDP estimates are made quarterly and released with substantial delays whereas the ECB has to set its benchmark interest rates each month. It is therefore useful to have more frequent and timely estimates of the state of the economy by way of business cycle indexes. These indexes are meant to reflect the current state of the economy and its likely development in the near future by using data that are more frequently available and timelier than GDP data. One can choose from a wealth of series that are generally available at a monthly frequency: industrial production, sales, consumer and business confidence, etc. For policy makers, it is relevant how these data can best be combined into an informative index of the state of the economy. This question is even more pressing for the euro area since less is known about the structure of this economic area as a whole. Particularly given the less than perfect correspondence between country cycles, it is important to know how much information is lost when focusing on a dataset of limited size for the largest euro area countries.

Chapter 2 examines how many different series are needed to get a good description of the euro area business cycle. The main finding in this chapter is that an index based on a relatively limited amount of economic series (less than forty) for France, Germany and Spain is able to capture the main cyclical facts for the euro area. However, another finding is that comparable variables in different countries have different effects. For example, German industrial production is much more important in explaining movements in euro area GDP than comparable series for France and Spain. This again brings the heterogeneity from Figure 1.1 to mind.

Although this heterogeneity is not crucial for short run policy making, in the long run, the monetary union is at risk if the common monetary policy is not suitable for most

countries, most of the time. Of course it is not always the same country that has either the maximum or minimum output gap in Figure 1.1, so it is useful to look at the correlation of (detrended) output of each country with euro area output.⁷ As Table 1.1 shows, the correlation with the euro area aggregate is on average higher for euro area countries than for the other countries in the table. However, this still leaves some countries with either an unrelated business cycle (Greece) or relatively low correlations (Finland, Portugal, Spain). On the other hand, although countries like Switzerland or Norway are not part of the European Union, they both had a business cycle that closely resembled the euro area cycle.

Table 1.1 Output correlation of European and non-European countries with the euro area, 1999-2003

<i>Euro area countries (average: 0.65)</i>			
Austria	0.78*	Ireland	0.81*
Belgium	0.83*	Italy	0.95*
Finland	0.47*	Netherlands	0.71*
France	0.98*	Portugal	0.47*
Germany	0.97*	Spain	0.47*
Greece	-0.26		
<i>Other countries (average: 0.38)</i>			
Australia	-0.57*	Norway	0.63*
Canada	0.44	Sweden	0.57*
Denmark	0.64*	Switzerland	0.91*
Japan	0.63*	UK	0.65*
New Zealand	-0.25	US	0.17

Source: OECD Quarterly National Accounts, supplemented with Eurostat data for Denmark, Italy, Norway, Sweden and Switzerland, for Japan with data from the Cabinet Office (SNA68 series), for Spain from INE (SNA68 series) and for Canada with data from Statistics Canada.

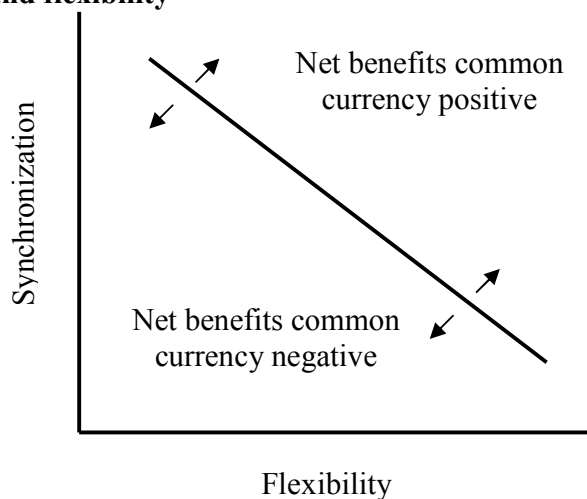
Notes: Correlations between band pass filtered quarterly GDP for each country and the euro area aggregate. The euro area aggregate excludes the country in question for euro area correlations. * denotes a correlation significantly different from zero at the 5% level.

While Table 1.1 shows that the business cycles of euro area countries are not perfectly correlated with the euro area aggregate, this may not be a big problem if the

⁷ Comparing (detrended) output of individual countries to the euro area aggregate would bias the correlations, since the country is part of the euro area aggregate. Therefore, each country is compared to an aggregate of all euro area countries, excluding the country under analysis.

economies in each country are flexible enough to adjust through a high mobility of capital but especially of labour. To see why this is the case, imagine that one of the euro area countries is hit by an adverse demand shock to its main export products. As a result, workers in the export industry will become unemployed and the country as a whole may enter a recession. However, if unemployed workers can easily find employment in a euro area country with excess demand for its products, the adverse effects will be much smaller for the first country. This underpins the idea that the costs of a common currency will be low when business cycles are very similar or when the economies are flexible enough to adjust to asymmetric shocks. In a recent paper, de Grauwe and Mongelli (2005) show this relationship in the following way.

Figure 1.2 The costs of a common currency for different levels of synchronization and flexibility



Source: De Grauwe and Mongelli (2005)

The net benefits of adopting a common currency depend to a large extent on these two dimensions discussed above.⁸ De Grauwe and Mongelli (2005) argue that the euro area has the right combination of synchronization and flexibility, while the European Union as a whole falls short. While the exact net benefits are hard to establish, Chapter 3 examines whether euro area countries will become more synchronized as economic and monetary integration increases. If synchronization is likely to rise under monetary union,

⁸ De Grauwe and Mongelli (2005) also look at the degree of economic integration, a topic which is discussed in more detail later.

the pressure for greater flexibility might decrease – at least from the perspective of the cost of the euro.

The effect of monetary integration on synchronization may be evaluated directly by examining whether more stable exchange rate regimes in Europe over the past decades have led to more synchronized cycles. After the demise of the Bretton-Woods golden-dollar standard in the early 1970s, exchange rates were allowed to be determined by market forces. However, within Europe, arrangements like the Exchange Rate Mechanism (ERM) were set up to stabilize exchange rates from the late 1970s onwards, culminating in the launch of the euro in 1999. A test of the impact of monetary integration is to see whether business cycles have become more similar as exchange rates have become more stable over time. A second approach to this problem is to look at the long run experience of business cycles within an existing monetary union. Since the U.S. is similar in size to the euro area, the history of business cycle synchronization between its states provides useful information. Finally, to draw policy-relevant conclusions, it is necessary to know the determinants of synchronization. Of specific interest is the importance of coordinated monetary and fiscal policy relative to trade links and other structural economic characteristics such as specialization in explaining synchronization. These factors are important because in addition to common monetary policy between EMU countries, differences in fiscal policy are also (to some extent) kept in bound through the Stability and Growth Pact. In addition, one might expect trade links to become stronger due to fixed exchange rates and specialization. Chapter 3 aims to disentangle how each of these consequences of economic integration affects business cycle synchronization.

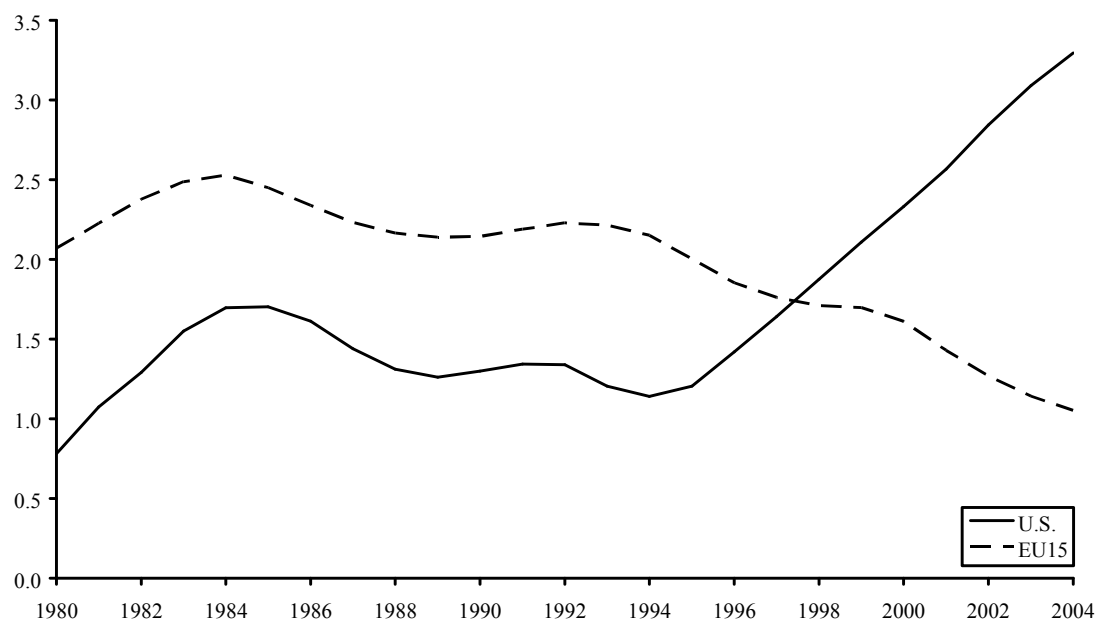
The analyses in Chapter 3 show that there is no strong trend towards ever greater synchronization, neither in Europe nor in the United States. However, as Table 1.1 showed, the degree of synchronization within the euro area has been higher than between OECD countries in general, and this has been the case since the mid 1980s. More coordinated monetary policy and more stable exchange rates have contributed to this development, as have more similar trade flows, fiscal policy and a greater degree of financial integration. As the monetary union becomes more established, synchronization is likely to increase even further, to levels similar to those between U.S. states. These

results suggest that the costs of the euro are likely to be sufficiently low to sustain political support for the euro. There are important uncertainties though, mainly about whether fiscal policy will remain relatively similar and to what extent specialization will increase or decrease. These uncertainties argue for greater flexibility of European economies, as well as the fact that a greater degree of flexibility will increase the net benefits of monetary union (Figure 1.2). In addition, research for the U.S. by Kim (1995) has shown that specialization tends to decrease as production factors more mobile. Furthermore, measures to stimulate (cross-border) labour mobility will also improve European competitiveness by making it easier to exploit new technologies.

1.3 Competitiveness in Europe

In the long run, the only way to increase income per head of population is to increase productivity. In general, per capita income can increase because a) a greater share of the population is employed, b) employed persons work more hours or c) output per hour worked increases. While there are natural limits to the employment rate and average hours worked, productivity growth is in principle unbounded. This makes it particularly worrisome that over the past decade, labour productivity growth in Europe has slowed down, while U.S. growth accelerated.⁹

⁹ A low employment rate is also among the challenges facing Europe, but this is not dealt with in detail in this thesis. See e.g. Garibaldi and Mauro (2002) and McGuckin and van Ark (2005).

Figure 1.3 Trend growth in GDP per hour worked in the EU-15 and U.S., 1979-2004

Source: GGDC (2005a)

Note: trend is estimated using Hodrick-Prescott (1997) filter on productivity growth

Figure 1.3 plots trend labour productivity growth for Europe and the U.S. for the period 1979-2004.¹⁰ The figure shows that European growth outstripped U.S. growth for most of this period, but the roles have reversed since the mid-1990s. From 1995 onwards, there is a clear rise in U.S. trend growth, while the European trend has been decreasing. Table 1.2 shows that despite much faster GDP growth, U.S. productivity growth outpaced European growth by a small margin during the ‘boom’-period between 1995 and 2000 because of the strong growth in U.S. hours. After 2000, GDP growth decreased in both Europe and the U.S., but the productivity growth gap widened substantially. The upside of this development is that European employment growth has been higher than in the U.S. since 2000. This could mean that Europe has ‘traded off’ productivity growth for employment growth. But one might as well turn this conclusion around and ask why GDP growth has not increased in line with higher employment growth.¹¹

¹⁰ The underlying data are from the GGDC (2005a) Total Economy Database. The trend is estimated using a Hodrick-Prescott (1997) filter. Note that as with any filter, the estimates for the beginning and end of the sample are less reliable than the other years. This mostly affects the first and last two years. When one is only interested in long-run trends, the Hodrick-Prescott filter is somewhat more convenient than the band pass filter used for Figure 1.1. As Chapter 3 describes in detail, the differences are generally not large.

¹¹ For more on the relationship between productivity and employment growth, see McGuckin and Van Ark (2005).

Table 1.2 Growth of output, employment and productivity in Europe and the U.S., 1987-2004

	EU-15			U.S.		
	1987-1995	1995-2000	2000-2004	1987-1995	1995-2000	2000-2004
GDP growth	2.2	2.7	1.4	2.7	4.0	2.5
Growth in total hours worked	0.0	0.9	0.4	1.6	1.9	-0.4
Growth in GDP per hour worked	2.2	1.8	1.0	1.1	2.1	2.9

Source: GGDC (2005a)

By now, most researchers agree that ICT has played a key role in the post-1995 productivity acceleration in the U.S., partly through strong productivity growth in the ICT production sector and partly through an ICT investment boom across the economy. Chapter 4 quantifies and analyzes these effects for both the American and European economies and asks why European growth has not taken off in tandem with the U.S. In an accounting sense, U.S. productivity growth has outstripped European growth because ICT production is a larger sector in the U.S. and because ICT investment has been higher than in Europe. However, a considerable fraction of the growth gap cannot be traced to a rise in capital or labour input and is labelled as total factor productivity (TFP) growth. TFP growth has been especially important in raising the contribution of market services to aggregate labour productivity growth.

To shed light on the role of TFP growth in understanding the productivity gap between the U.S. and Europe, one of the assumptions underlying the neoclassical growth accounting framework is relaxed. Instead of assuming that the marginal productivity of ICT capital is equal to its marginal cost, econometric techniques are used to estimate the marginal product. It turns out that the marginal product of ICT has followed a U-shaped pattern over time. Up to the early 1980s, ICT capital returned its marginal cost, but since then it turned negative. It was not until the start of the 1990s that the productivity and costs of ICT capital came back into balance again. Furthermore, these developments occurred a few years earlier in the UK and U.S. than in France, Germany and the Netherlands.

One explanation for this pattern is that the relatively straightforward savings from ICT were realized early on in the diffusion process. However, additional productivity gains first required complementary innovations in organizational change and (unmeasured) investment in intangible capital. This appears of particular importance in

services industries. An example can be found in retail trade. While it has been relatively straightforward to adopt barcode scanning in supermarkets to speed up check-out, it has been much harder and time-consuming to reorganize the supply chain and take advantage of the increased information on customer purchases. As a result, after the initial cost savings, it took a long time before a noticeable impact on productivity could again be found. It can be argued that restrictive product and labour market regulation are important reasons for lagging ICT diffusion in Europe. Such regulations may have hampered complementary innovations, making ICT investment less profitable.¹²

While Chapter 4 focuses on structural explanations for differences in productivity growth, cyclical factors cannot be discounted out of hand. Figure 1.3 showed productivity growth trend estimates because year-to-year changes in productivity tend to fluctuate, obscuring longer run patterns.¹³ These fluctuations are not just random noise. Productivity growth tends to be procyclical, i.e. it is generally higher during economic expansions than during recessions. As a result, some have argued that business cycles are caused by technology shocks, the so-called Real Business Cycle theory. Another explanation for procyclicality is that firms may decide not to immediately fire workers during downturns in demand, but instead ‘hoard’ those workers until economic conditions improve. Chapter 5 examines a number of explanations for cyclical productivity for three European countries and the United States.

The analysis in Chapter 5 relaxes two key assumptions commonly used in the empirical productivity literature, namely constant returns to scale (if all inputs increase by one percent, output is assumed to increase by that same one percent) and exact measurement of labour and capital input. Instead, the analysis allows for variable returns to scale and unmeasured variation in capital utilization and labour effort. The results provide only limited statistical evidence against constant returns to scale and well-measured inputs. Furthermore, even when taking the limited evidence at face value, productivity appears still procyclical in many industries. Most relevant for this study, the stylized facts about productivity growth do not change when allowing for variable returns

¹² See McGuckin, Spiegelman and van Ark (2005) for more on productivity growth in retail trade.

¹³ See also Inklaar and McGuckin (2003) on this topic.

to scale or unmeasured input utilization, confirming the importance of supply-side factors.

1.4 An agenda for reform

Although there are still important gaps in our understanding, the research presented in this study points at a number of directions in which European economic performance can be improved. Foremost among these are reforms to foster flexibility of product and labour markets. European firms are exploiting new technologies at a much slower rate than their American counterparts and as a result, Europe is missing out on potential productivity growth. Removing barriers to entry and growth of new firms can help spur ICT investment and foster the necessary complementary innovations. It should also become easier for existing firms to, for example, open up new branches or try out new business concepts without wading through endless reams of red tape. Further efforts at freeing up trade in services will also make it easier for successful firms to achieve sufficient scale. In a similar fashion, a more flexible workforce makes it less costly when experiments do not work out in practice. All these measures feature in the Lisbon reform agenda, and although implementation is still patchy, the research in this book shows that based on the experience of the U.S., the potential gains are large.

As discussed earlier, flexibility also improves the cost-benefit analysis for using a common currency. So in addition to stimulating competitiveness, reforms aimed at more flexible product and labour markets also reduce the costs of a common currency. It seems likely that synchronization of business cycles will be high enough for the costs of the EMU to remain containable, but this is contingent on a stable or decreasing degree of specialization and coordinated fiscal policy. Strict deficit rules are not all that important in this respect, but the more qualitative rule to keep cyclically-adjusted deficits at or above zero should contribute positively to synchronization. Reforms that enhance the flexibility of European labour markets will increase the freedom of movement for government policy.

