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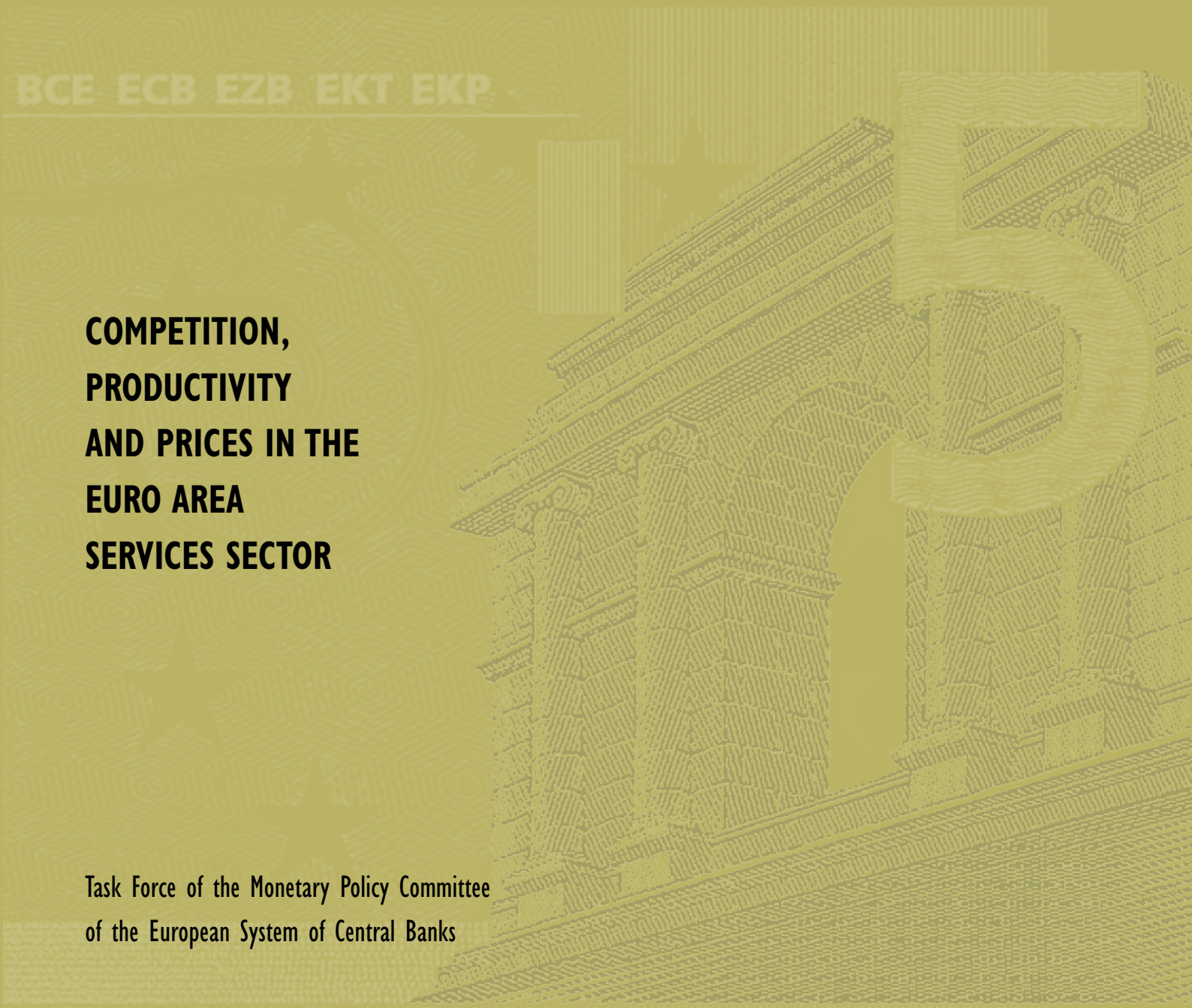

COMPETITION, PRODUCTIVITY AND PRICES IN THE EURO AREA SERVICES SECTOR

Task Force of the Monetary Policy Committee
of the European System of Central Banks

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Address
Kaiserstrasse 29
60311 Frankfurt am Main
Germany

Postal address
Postfach 16 03 19
60066 Frankfurt am Main
Germany

Telephone
+49 69 1344 0

Website
http://www.ecb.int

Fax
+49 69 1344 6000

Telex
411 144 ecb d

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TASK FORCE OF THE MONETARY POLICY COMMITTEE OF THE EUROPEAN SYSTEM OF CENTRAL BANKS

This report was drafted by an ad hoc Task Force of the Monetary Policy Committee of the European System of Central Banks. The Task Force was chaired by Ad van Riet. The coordination and editing of the report was carried out by the Chairman and the Secretary, Moreno Roma. Stefanie Peuckmann provided editorial assistance.

The full list of members of the Task Force is as follows:

Ad van Riet Moreno Roma Elena Yusupová Wim Haine Mika Kuismanen	European Central Bank
David Cornille	Nationale Bank van België/Banque Nationale de Belgique
Jörg Döpke	Deutsche Bundesbank
Daphne Nicolitsas	Bank of Greece
Paloma Lopez-Garcia	Banco de España
Valérie Chauvin	Banque de France
Derry O'Brien	Central Bank and Financial Services Authority of Ireland
Fabiano Schivardi	Banca d'Italia
Erik Walch	Banque centrale du Luxembourg
Mathijs Gerritsen	De Nederlandsche Bank
Jürgen Janger	Oesterreichische Nationalbank
João Amador	Banco de Portugal
Ilmo Pyyhtiä	Suomen Pankki – Finlands Bank

EXECUTIVE SUMMARY

RATIONALE AND MAIN OBJECTIVE OF THE REPORT

Given the growing importance of the services sector in the economy, this report addresses issues related to competition, productivity and prices in that sector. Limited competition in the services sector is often referred to in policy debates as one of the factors hindering labour productivity growth in that sector and contributing to higher inflation there than in the manufacturing sector. More competition in services markets is an important objective of the Lisbon strategy and the call for a fully operational internal market for services in the European Union is at the top of the European policy agenda. Moreover, the gap in labour productivity growth between the euro area and the United States recorded since the 1990s is often related to a poor labour productivity performance in key services sectors, in particular wholesale and retail trade, where the capacity of the euro area to innovate and make use of new technologies has lagged behind that of the United States. Additionally, empirical studies conducted within the Eurosystem Inflation Persistence Network (IPN) found that, when compared with manufactured goods, services are characterised by less frequent, larger and mostly upward price changes. In particular, a higher degree of price stickiness could lead to a more persistent output loss following a negative cost-push shock. Finally, services inflation is one of the factors behind aggregate inflation differentials in Economic and Monetary Union (EMU).

These issues are important per se. They are even more so because the importance of the euro area services sector has significantly increased over time, with it now accounting for around 70% of the euro area's total value added and employment. Given its large and growing share of the total economy and the fact that services represent an important input for other sectors of the economy, developments in the services sector in terms of labour productivity and prices are important for the conduct of monetary policy in the euro area. The main objective of this report, which has been prepared by an ad hoc task force of the Monetary Policy Committee of the European System of Central Banks, is to analyse the degree of competition in the euro area services sector and its effects on productivity and prices in that sector, in order to contribute to a better understanding of price dynamics and the monetary policy transmission mechanism in the euro area. The data available for this report cover the period 1980-2003 and the cut-off date for the statistics included was 15 September 2005.

MAIN FINDINGS

Chapter 1 first discusses the economic theory and the main findings in the literature, leading to the conclusion that services market competition is an important factor explaining labour productivity and prices in the services sector. Chapter 2 then explores how the share of services in the euro area's total value added and employment has evolved over time and which drivers are responsible for these developments. In addition, it presents the key facts regarding labour productivity and inflation in the services sector, describing the main trends over time across countries and services industries. It is worth stressing that several measurement issues arise in the computation of labour productivity growth and price changes in the services sector which should be borne in mind when interpreting the results.

The main results of this fact-finding exercise may be summarised as follows:

– From 1980 to 2002 the share of services in employment and in value added in the euro area increased by about 16 and 13 percentage points, respectively, to reach close to 70% of total employment and nominal value added in 2002. As pointed out in the literature, the increasing importance of this sector in the euro area economy is mainly being driven by the following factors: a higher demand for services related to higher income levels, an increased participation of

women in the labour market partly associated with a shift from household to services activities, a process of market liberalisation and globalisation in some services industries and, in the first part of this period, the increasing role of the public sector in the economy. This secular trend is likely to continue.

– Labour productivity growth in the services sector as a whole in the euro area and in the majority of the euro area countries decreased in the 1990s relative to the 1980s, and even more when compared with the United States.

– Labour productivity growth across the euro area services industries appears to be characterised by a high degree of diversity. Over the last two decades, some services industries (such as post and telecommunications and financial intermediation) experienced a relatively strong productivity performance. Some other services sectors (such as hotels and restaurants, real estate, renting and business activities, and community, social and personal services) exhibited rather weak or even negative labour productivity growth.

– More specifically, in the wholesale and retail trade sector the increase in labour productivity was much smaller in the euro area than in the United States, the United Kingdom and some Scandinavian countries (Denmark, Sweden), both in the 1980s and in the 1990s. The gap between the euro area and the United States has widened considerably since the 1990s. By contrast, labour productivity growth in transport and storage and communication in the euro area was higher than in the United States (both in the 1980s and the 1990s) and this gap widened in the 1996-2003 period.

– Turning to price developments, value added price changes for total services and for the majority of services industries decreased in the 1980s and 1990s in the euro area. In particular, the value added price changes in post and telecommunications recorded a sharp fall over time in the majority of euro area countries.

– The services component had a weight of 41% in the euro area Harmonised Index of Consumer Prices (HICP) in 2005. In addition, the level of services inflation is on average higher than aggregate HICP inflation. At a country level, the difference between services inflation and non-energy industrial goods inflation is positively correlated with the aggregate inflation differential of a country vis-à-vis the euro area, suggesting that services inflation is one important factor behind aggregate inflation differentials in EMU.

– Additional insights into price-setting behaviour in the euro area services sector stem from the empirical studies conducted within the Eurosystem IPN. The services sector was consistently found to be the most rigid sector in the economy in terms of price setting across all countries considered. To some extent, this could be due to its cost structure, given the heavy weight of wages, which tend to be more rigid than some other costs. However, it could also be the result of limited competition in the services sector, as the IPN provided some evidence of a positive relationship between the degree of competition and the frequency of price adjustment. Enhancing competition in services markets could therefore reduce price rigidities in the services sector.

Focusing on non-financial business services sectors, Chapter 3 then investigates a number of proxies of services market competition that can be divided into three categories: proxies measuring corporate profitability, proxies capturing the degree of regulation and trade openness, and proxies of market structure:

– Regarding the proxies of corporate profitability, the mark-up and profit margin in the euro area non-financial business

services sectors exceeded the corresponding indicators for the total economy and manufacturing in the 1980s and 1990s. Drawing strong conclusions on the evolution of competition over time making use of these proxies is however generally quite difficult, given that a high profitability could either be associated with limited competition or with high dynamic efficiency of firms within a competitive sector leading to productivity gains. In general, stronger competition should however reduce profits in the medium to long run.

– As regards the proxies capturing the degree of regulation and trade openness, the regulatory environment in the euro area countries has become more supportive of services market competition over time, although it remains generally tighter than in the United States. Although trade openness in services is commonly lower than in manufacturing, the services sector has generally become more open over time. More specifically, some network industries (telecommunications and air transport) have experienced a marked opening-up to international competition since the beginning of the 1990s. By contrast, retail and professional services showed only limited progress in terms of deregulation in the period between the mid-1990s and 2003. All in all, differences in the degree of regulation and trade openness across countries and services industries remain considerable.

– With regard to proxies of market structure, the report finds a substantial variation of firm size across countries and sectors (differences are larger in more regulated sectors such as transport and telecommunications). Southern European countries tend to be characterised by an average firm size in the services sector which is smaller than the euro area average and they also tend to have a larger share of self-employment. These results are an indication of a more traditional productive structure in the services sector in these countries. However, drawing firm conclusions about the evolution of competition from this indicator is difficult, given that, on the one hand, average firm size may be positively related to market concentration and, on the other hand, a fragmented market structure might be an indication of barriers to entry for more efficient organisational modes, such as large retail outlets.

Chapter 4 goes on to investigate the empirical link between the proxies of services market competition discussed above and labour productivity growth and value added relative price changes (i.e. services relative to the total economy) in the non-financial business services sectors. Some key macroeconomic variables and country-specific factors which could have affected labour productivity growth and value added relative price changes are also explicitly considered. It is worth stressing that results should be interpreted with caution given that a deeper empirical analysis would be needed to substantiate the results and to test their robustness:

– Concerning labour productivity growth in the services sector, results show that taking into account some of its key macroeconomic determinants (R&D expenditure, the GDP per capita gap with the euro area, etc.), limited competition in services tends to hamper labour productivity growth in the services sector. Results differ however across sub-sectors and in the case of hotels and restaurants and real estate, renting and business activities, the proxies of services market competition are generally not statistically significant.

– With regard to value added relative price changes, services market competition seems to affect services industries in a substantially heterogeneous way. The results of the quantitative analysis indicate that in all sectors higher relative profit margins are associated with higher relative price

increases. These results should however be cautiously interpreted given the caveats associated with profitability as a measure of competition (see above). Moreover, in wholesale and retail trade, hotels and restaurants, and transport and storage, the other proxies of services market competition are not statistically significant in explaining relative price changes. However, in post and telecommunications and real estate, renting and business activities, tighter sectoral regulation and some indicators of economy-wide product market regulation are associated with higher price increases or lower price decreases, suggesting that increased services market competition has a dampening impact on relative price changes in these sectors.

POLICY CONCLUSIONS

The following policy conclusions may be drawn from the analysis in this report. Measures aimed at increasing services market competition may increase economic efficiency and economies of scale. This would support a higher level and growth rate of labour productivity in the services sector and promote a more dynamic economy. Moreover, results tend to suggest that measures aimed at increasing services market competition may have a dampening impact on relative price changes in some services sectors and thus temporarily on aggregate inflation. In addition, according to the IPN, this could contribute to the reduction of price stickiness in some services industries. Gains in price flexibility brought about by increased competition are likely to be of a permanent nature. Overall, a higher level of competition in the services sector would tend to support more efficient and flexible services markets, facilitate adjustment processes and increase the resilience of the euro area to economic shocks.

1 ECONOMIC IMPACT OF SERVICES MARKET COMPETITION

This chapter first discusses the economic theory explaining the effects of services market competition on productivity and prices (Section 1.1) and then presents a selective literature review of the main empirical findings (Section 1.2; for an exhaustive review of the literature see Annex 3).

1.1 MACROECONOMIC RATIONALE AND TAXONOMY[1]

1.1.1 DEFINITION AND TYPES OF COMPETITION

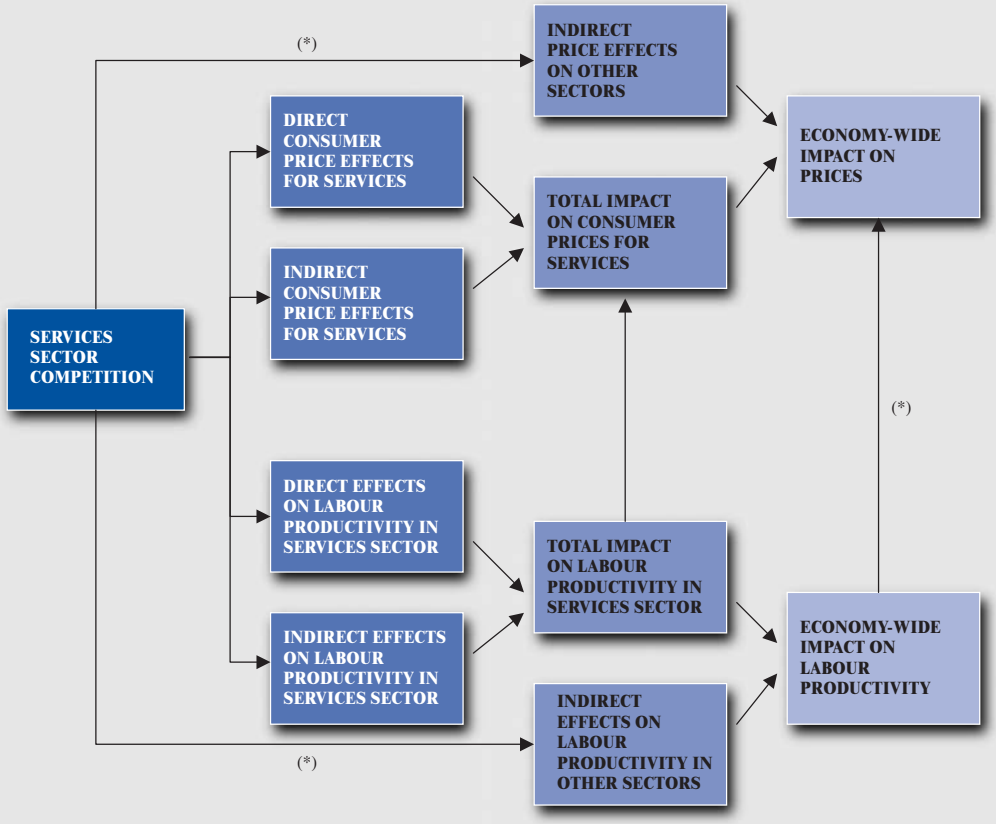
Perfect competition is generally associated with a market structure where all economic agents are price-takers, and firms are able to enter and exit the market freely without incurring fixed costs and cannot exploit increasing returns to scale. Competition is believed to drive market prices down to a level equal to the marginal costs. Under appropriate (and rather restrictive) assumptions, such a competitive equilibrium is *Pareto optimal,* i.e. it cannot be replaced by another that would increase the welfare of some consumers without harming others.

In the real world, perfect competition is rare, especially in the services sector, where the heterogeneity of the output supplied may create monopolistic power for the suppliers, and different degrees and types of competition can be observed in the market for services.

Moreover, services market competition can take place in a domestic market (*domestic competition*) and/or across borders (*international competition*). Domestic competition occurs in the case of services which are not tradable (e.g. restaurants) or are characterised by an intrinsic local character (e.g. recreation activities in a domestic language). International competition in services can be limited not only by the nature of the products involved, but also by legal barriers to trade or legislation discriminating between local and foreign firms (see Box 1).

1 Prepared by Moreno Roma.

Chart 1 The direct and indirect effects of services market competition on productivity and prices – a stylised description



(*) Interactions not directly analysed in the report

1.1.2 THE EFFECTS OF SERVICES SECTOR COMPETITION ON PRODUCTIVITY AND PRICES: THE ECONOMIC THEORY

This report deals with the effects of services market competition on productivity and prices in the services sector. Chart 1 describes in a stylised and simplified manner the direct and indirect effects of services market competition on productivity and prices.[2]

A broad range of product market reforms yielding an increase in effective services market competition, for example by removing barriers to entry or by directly reducing monopoly rents or facilitating mergers and acquisitions, have direct and indirect effects on services sector labour productivity (European Commission, 2004d). *Direct effects on services sector labour productivity* (see bottom of Chart 1) arise from the reduction in the costs of doing business and from the removal of entry barriers.

Indirect effects of increased services sector competition *on services sector labour productivity* operate through three main channels (European Commission, 2004d), namely (i) a reduction in mark-ups and a better reallocation of scarce resources (*allocative efficiency*); (ii) an improvement in the utilisation of the factors of production by firms (*productive efficiency*); and (iii) an incentive for firms to innovate and to move to the technology frontier (*dynamic efficiency*). The first indirect effect, allocative

2 It is worth stressing from the outset that some of the interactions which exist in the economy, such as the effects of labour market regulations on employment, wages, productivity and output, are not directly analysed in this report in order to improve its focus.

efficiency, is achieved thanks to greater contestability of the markets brought about by product market reforms which induce firms to set prices closer to marginal costs and thereby allocate inputs more efficiently. Moreover, more competition could also force less productive and efficient firms to exit the market. The second effect, productive efficiency, works through increased incentives of managers to step up efforts and improve performance as a result of intensified competition. Stronger competition can also reduce information asymmetries and render corporate performance more comparable. Finally, the third indirect effect, dynamic efficiency, operates via increased incentives for firms to develop and/or implement product and process innovation as a result of higher competitive pressures (see Box 6). There is increasing evidence of a non-linear relationship between competition and innovation (Aghion et al., 2002), with very high and very low levels of competition providing lower incentives to innovate (so-called "inverted U-shaped relationship"). It is important to stress that gains in allocative and productive efficiency brought about by changes in competition (and more generally changes in the regulatory framework governing product markets) represent *one-off changes* to the *level* of productivity. These changes, also known as *static gains*, are deemed to take place relatively quickly. In contrast, effects of dynamic efficiency on productivity, also known as *dynamic gains*, are considered to *raise the level and the growth rate of total factor productivity* in the long run and to have a potential larger and long-lasting impact on productivity, albeit materialising less quickly, compared with static gains. The effects of services market competition on the growth rate of labour productivity will be explored in Chapter 4. In practice, distinguishing between static and dynamic gains is a complex task given that even static gains brought about by increased competition may take some years to materialise.[3] *Direct and indirect effects on services sector labour productivity* amount to the total impact of services market competition on services sector labour productivity, which is the focus of this report.

Services sector competition can also indirectly affect labour productivity in other sectors of the economy (*indirect effects on labour productivity in other sectors*) which use services as an input in their production process. This channel, marked with an asterisk in Chart 1, is however not analysed in this report.

Moving on to the impact of services market competition on prices (see top of Chart 1), increased competition is generally associated with a lower price level brought about by a reduction in the mark-ups of firms, for given marginal costs. Moreover, stronger competition stimulates a more efficient use and allocation of resources thereby increasing allocative efficiency, exerting downward pressure on costs and triggering price reductions (European Central Bank, 2002b). The price (level) effects in services are both *direct*, via the effects of reduced prices of services for consumers, and *indirect* via the reduction of the prices of services used as inputs within the services sector. The sum of these two effects is the *total impact of services market competition on consumer prices for services,* which is the main focus of this report. Moreover, there are also indirect consumer price effects on other sectors of the economy which use services as an input and there may also be second-round effects on wages and prices. The effects of changes in competition on *price levels* are expected to persist. It can take several years until the industry has reached a new *steady state.* During this period of *relative price adjustments,* the inflation rate is also expected to be *temporarily* affected by such changes in competition, notwithstanding the fact that in the long run the aggregate inflation rate is driven by monetary developments. The effect of services sector competition on relative services price changes is investigated in Chapter 4.

3 It is important to point out that increased services market competition may also be associated with short-term losses in output and employment to the extent that resources released from industries previously sheltered from competition are not immediately reutilised. To this end, policies facilitating labour mobility and wage flexibility, easing employment protection legislation and supporting skill development should be pursued to mitigate these short-term adjustment costs.

Additional reasons have been presented in the literature to justify an effect of services market competition *on services inflation* for a prolonged period of time (for a discussion see Chen et al., 2004, Cavelaars, 2003, and Przybyla and Roma, 2005). At the aggregate level, in an economy characterised by product market imperfections and rigidities (such as limited competition in the services sector), the central bank could have an incentive to produce surprise inflation as a means to raise output growth in the short to medium run. This well-known argument was originally put forward by Kydland and Prescott (1977) and Barro and Gordon (1983) and is known in the literature as the time inconsistency theory. Obviously this argument does not hold in the case of a central bank whose primary objective is maintaining price stability, but the degree of services market competition prevailing in the economy could influence the incentives of other policy-makers and economic actors.

Moreover, the more competitive an economy, the more flexible it is likely to be in terms of wages and prices and factor substitution of inputs. More flexible wages and prices are likely to render the monetary policy commitment to low inflation more credible (see Rogoff, 2003), facilitate adjustment processes and increase the resilience of an economy to unanticipated shocks (Rotemberg and Woodford, 1996, and OECD, 2005e). In particular, a lower degree of price stickiness could lead to a less persistent output loss following a negative cost-push shock. This is particularly relevant in the case of services given that several studies (see Section 1.2) have shown that prices in services are generally stickier than in manufacturing and that companies operating in markets with a higher degree of competition adjust their prices more frequently in response to cost and demand factors (Fabiani et al., 2005). A higher degree of services market competition should therefore directly reduce the overall degree of price stickiness and inflation persistence, thereby helping to maintain price stability.[4] Increased flexibility in services prices is also likely to be indirectly beneficial for the overall economy given that several services represent inputs to other sectors of the economy. Gains in price flexibility brought about by increased competition are likely to be of a permanent nature.

Finally, increased international services market competition should also allow consumers to compare prices more easily, especially in a monetary union, thereby increasing price transparency, enhancing arbitrage possibilities across countries and allowing a smoother functioning of EMU. Reduced services inflation dispersion across countries is also likely to reduce euro area inflation differentials. This process could also be facilitated by the advancement of new information technologies such as the internet and electronic commerce (see Wadhwani, 2000, and Box 6). More competitive economies could therefore experience lower inflation rates for a prolonged period of time (see Chapter 4 for a discussion). In contrast to goods, no fully functioning internal market exists for services in the European Union. In practice, many hurdles hinder service providers in terms of both freedom of establishment and cross-border provision without establishment, as shown in European Commission (2002). Differences in the regulatory environment across countries imply that firms face difficulties and high costs in establishing subsidiaries to provide services in another Member State. In particular, small and medium-sized enterprises (SMEs) report lengthy administrative procedures, which delay or even prevent the provision of cross-border services (for a discussion, see Box 1).

1.2 SELECTIVE LITERATURE REVIEW[5]

Empirical research shows divergent developments in labour productivity and prices between the manufacturing and the services

4 A lower degree of inflation persistence is likely to imply a smaller response of policy rates to cost-push shocks in terms of size and persistence of the policy response. The intuition is that with a lower degree of inflation persistence, the impact on inflation of a shock is smaller than in a high persistence case given that economic agents anticipate a lower persistence of the shock over time.

5 Prepared by Elena Yusupová.

sectors. Services sector studies document a decline in labour productivity growth in the euro area, accompanied by a positive gap in productivity growth between manufacturing and services and between the services sector in the United States and Europe. In addition, labour productivity developments are substantially more heterogeneous across services industries compared with the variation across manufacturing industries.

Empirical studies conducted within the Eurosystem IPN have focused on sector-specific price developments and their dynamics, as well as on patterns of price-setting behaviour in the euro area countries (Angeloni et al., 2005, Dhyne et al., 2005). In contrast to manufacturing goods, services are characterised by less frequent, larger and mostly upward price changes. These results are quite homogeneous across the euro area countries regardless of the legislative framework and other country-specific characteristics. Moreover, prices of manufacturing goods in the euro area show in general lower dispersion rates and faster convergence than prices of services.

The literature discusses several factors driving the differences in labour productivity and price developments between the services and the manufacturing industries and among countries, pointing out the key role played by competition in this process (see also Annex 3).

Three *sources of differences in labour productivity levels and growth rates* between manufacturing and services are mostly identified in the literature.

First, services are characterised by lower capital intensity compared with manufacturing (Wölfl, 2005). However, Pilat (1996) and van Ark et al. (1999) report an ambiguous impact of this factor on labour productivity in services.

Second, the lower rate of innovation and use of information and communication technology (ICT) might contribute to lower levels and growth rates of labour productivity in the services sector than in manufacturing, hampering dynamic efficiency. However, several studies conclude that computerisation does not immediately lead to labour productivity growth due to the increased costs of reorganisation and structural changes it imposes on firms (Wolff, 1999). Nonetheless, the level of innovation and the use of ICT represent an important factor explaining the services sector productivity gap in terms of growth rates and levels between the United States and Europe (Nicoletti and Scarpetta, 2003, Gordon, 2004).

Third, services are less traded internationally and so competitive pressures are weaker in these industries. The importance of this factor is further enhanced by its indirect impact on market structures and consequently innovative activities (Nicoletti and Scarpetta, 2003, Faini et al., 2004, Pilat, 1996). Generally, deregulation and liberalisation, in particular freedom of establishment and free movement of services, contribute to higher levels and growth rates of labour productivity (Faini et al., 2004), but other variables must also be taken into account when explaining productivity (for example, human capital, R&D, economies of scale[6], investment). Moreover, results of the impact of competition on productivity are often sector-specific (European Central Bank, 2004b).

Regarding *the impact of competition on price developments*, empirical studies concentrate mostly on the direct impact of competition on price levels and inflation via downward pressure on profit margins and mark-ups and changes in the institutional structure (e.g. Neiss, 2001, Cavelaars, 2003, Przybyla and Roma, 2005). Stronger competition is generally found to increase efficiency and exert downward pressure on costs and prices, even if the empirical evidence is not always clear-cut.

Although the mark-up, profit margin, institutional and market structure and trade restrictiveness are identified as the main factors

6 The exploitation of economies of scale is however limited by the fact that services cannot be physically stored.

explaining price levels and inflation developments across countries, the variation in sectoral inflation is also driven by country-specific effects (OECD, 1997). Moreover, the impact of individual competition proxies on prices varies across industries, i.e. the same variable can have a different impact in two different services sectors, given the characteristics of the provided services and their tradability (Kalirajan, 2000, Faini et al., 2004).

Overall, these findings of the recent literature lead to the conclusion that competition is an important factor explaining both productivity and price developments in the services sector.

The existence of various *measurement issues* in the services sector, which might bias the results of the analysis, is often stressed in the literature (see Annex 2 for a discussion). The problem of output and inflation measurement relates mainly to the heterogeneity of the provided services which are often not comparable across firms and to the absence of methodologies which incorporate quality and technological improvements (Wölfl, 2005, Diewert and Fox, 1999).

With regard to the measurement of competition, some limitations related to the proxies used for its quantification are also at play: mark-ups and profit margins do not capture quality improvements (Baily and Solow, 2001) and the use of some market structure indicators is complicated by their endogenous characteristics (Boylaud, 2000, Pilat, 1996). Finally the distinction between services and manufacturing may in some cases be complicated by rapid technological changes (see Chapter 2).

All in all, with the increasing heterogeneity of the provided services, the introduction of ICT and quality changes, quantifying output and inflation in the services sector and choosing appropriate proxies of competition pose important challenges for research on productivity and price developments in the services sector.

Box 1

THE EUROPEAN COMMISSION PROPOSAL FOR A DIRECTIVE ON SERVICES IN THE INTERNAL MARKET[1]

The proposed EU Directive[2] on Services in the Internal Market, put forward by the Commission in January 2004, aims at the codification of the existing jurisprudence of the European Court of Justice and at the provision of more legal certainty for service providers that want to exercise two fundamental rights enshrined in the EC Treaty: freedom of establishment and freedom to provide services.

The proposed Directive covers a wide range of different services provided to consumers (e.g. tourism and healthcare services), to businesses (e.g. management consultancy, advertising and recruitment) and to both consumers and businesses (e.g. legal or fiscal advice, real estate, construction and travel agencies). The proposal does not cover those services, such as public administration or public education, that are of a non-market nature. Furthermore, it does not cover sectors such as financial services and telecommunications, which are in the main treated by other Community instruments.

1 Prepared by Derry O'Brien and Juergen Janger.
2 European Commission (2004c); European Parliament (2004) provides important clarifications of the Commission proposal.

The main features of the proposed Services Directive are as follows:

– The simplification of administrative procedures to facilitate establishment of service providers. It asks for a *single point of contact* for service providers for each industry where all relevant application procedures can be completed, and in most cases, an option to complete these administrative formalities online. It also obliges Member States to ensure easy access to information on the legal and administrative requirements.

– The modernisation of authorisation and licensing regimes for service providers wanting to establish a new business in their home or the host country. A number of authorisation requirements restricting establishment, referred to as the Black List, are specifically prohibited, while other authorisation requirements, contained in the Grey List, would have to be justified.

– Member States are called upon to establish a system of administrative cooperation with obligations of mutual assistance, so that service providers are properly supervised, and also to exchange information in a timely manner.

– The application of the *country of origin principle,* which means that a service provider that may not wish to establish itself in the host country but still wants to provide a service there (cross-border service provision) will only need to comply with the regulations of its country of establishment. The responsibility for supervision will also mainly lie with the country of establishment. There are derogations to the country of origin principle for certain cases, such as the recognition of professional qualifications and the temporary posting of workers.[3] There is also a derogation from the country of origin principle for issues relating to public health, public safety and environmental protection (in general, for all the fundamental rights which form an integral part of the general principles of law enshrined in the Community legal order). This is however subject to special conditions and an evaluation procedure.

– The proposed Directive also foresees the harmonisation of certain requirements concerning consumer protection, the reinforcement of the rights of recipients of services, and the promotion of quality-enhancing measures such as voluntary certification and codes of conduct at the Community level.

Some contentious elements of the proposed Services Directive

There remains some potential for legal uncertainty for consumers and service providers, since it is unclear to what extent they are likely to be affected by the Directive. There is also some concern that the Directive is not entirely consistent with the existing EU *acquis communautaire.*

Many of the issues raised in the discussion of the Services Directive concern cross-border service provision rather than free establishment of service providers, with the most contentious issue in the Commission proposal being the country of origin principle. It is feared that the application of this principle would entail downward pressure on social and environmental standards. In this respect, however, it should be kept in mind that the Services Directive would

3 These are covered by the Mutual Recognition of Professional Qualifications Directive and the Posting of Workers Directive, respectively.

not affect posted workers. Workers posted by their employer in other Member States will be covered by the Posting of Workers Directive, according to which minimum working conditions of the country where the worker is posted have to be respected. The country of origin principle would however bring about significant changes for self-employed workers by allowing them to provide services on a temporary basis in the host country on the basis of the rules of their home country (although these workers would still be obliged to meet host-country consumer protection and safety regulations). Thus, the Directive may open the door for self-employed workers to undercut rates in the host country. This also carries the risk of increasing fraudulent practices. A fear commonly cited in this respect concerns so-called "false" self-employed workers, whereby workers are employed by firms in the home country but are declared as self-employed in the host country and thus work on the basis of the conditions of that country. Some therefore fear a scenario in which wages and welfare standards would be driven down in those Member States where costs are currently relatively high.

If the country of origin principle is applied and it becomes easier to provide cross-border services on a temporary basis, controls will take on added importance. Under the original proposal, fraud or certain abuses that already occur, such as a firm declaring bankruptcy before meeting tax or social security obligations, may prove more difficult to redress as responsibility for the service providers would rest with the country of origin. The country of origin may not always have sufficient incentive to prosecute illegal activities abroad and thus there are some calls for responsibility to rest with the country where the service is provided. In addition, effective control requires an effective system of administrative cooperation, which is not in place and may prove difficult to establish. However, a European Commission Group has been established to improve administrative cooperation between officials of the national authorities responsible for internal market issues, including the proposed Services Directive. This, combined with the legal basis for cooperation in the Services Directive, is intended to create the necessary trust and confidence between Member States.

The second aspect of the proposed Directive that has drawn considerable opposition concerns the scope of the Directive. In particular, the proposal applies also to health and specific social services, if only in a limited number of instances. However, health and social services are seen as core public services, representing a pillar of the European social model, which according to some observers should not be subject to the competitive forces of the internal market.

Economic impact

Depending on the final version of the Directive, it may have substantial and far-reaching consequences for EU economies. In general, firms will still have to become familiar with different national laws, regarding, for example, consumer contracts, although some provisions for further harmonisation are also included in the proposed Directive. To some extent, geographical distance will limit cross-border service provision more than trade in goods, as the cost of travel and accommodation for workers may need to be added to the price of service provision.

The CPB Netherlands (2004) examined how cross-border trade and foreign direct investment would be affected if the proposed Directive were implemented. Taking the bilateral services trade pattern in 2001 as a reference, the authors found that EU bilateral trade and investment in commercial services (except transport) could increase permanently by up to a third, with countries with a high degree of heterogeneity in national regulation likely to experience greater gains. The potential

impact, in terms of increased growth and employment, of the original version of the Directive is difficult to project. According to the European Commission (2004c), the benefits that would accrue from the removal of barriers to the integration of services markets could be comparable to the gains generated from the implementation of the Single Market Programme for the goods market (i.e. a 1.8% increase in GDP and the creation of 2.5 million jobs). Copenhagen Economics (2005), taking into consideration static effects only, estimates more modest gains in welfare and employment of 0.7% and 0.3% (corresponding to a net increase of 600,000 jobs) respectively. Along with the boost to output and employment, consumers would also benefit from reduced prices.

The legislative process

The proposed Directive has raised considerable opposition among politicians, some employers' associations and particularly trade unions, which fear it may have a negative effect on employment rights and wage levels. Against this backdrop, the legislative process may produce a fundamentally different Services Directive compared with the Commission's original proposal. The Directive is subject to co-decision between the Council and the European Parliament and, at the time of writing, is undergoing the usual process of amendment.

The European Parliament adopted its position at first reading in February 2006. Generally speaking, the European Parliament suggests replacing the country of origin principle by the principle of freedom to provide services and also proposes to exempt additional services from the scope of the Directive. The draft bill will be reviewed by the European Commission and then sent to the Council. If the Council agrees with all the legislative changes, the legislative process will end there. If on the other hand the Council makes further changes or rejects some amendments, the bill will return to the European Parliament for a second reading. If agreement can be reached at EU level, the provisions of the Directive will be implemented on a phased basis and will only become effective after its incorporation into national law. It is expected that the Directive will take full effect by 2010.

2 LABOUR PRODUCTIVITY AND INFLATION IN THE SERVICES SECTOR

After having discussed in Chapter 1 the economic theory and the main empirical findings concerning the effects of services market competition on productivity and prices, this chapter explores how the share of services in euro area total value added and employment has evolved over time and which drivers are responsible for these developments (Section 2.1). Section 2.2 presents the key facts regarding labour productivity developments and inflation in the services sector, showing the main trends over time and across countries and industries.

2.1 MACROECONOMIC IMPORTANCE OF THE SERVICES SECTOR[7]

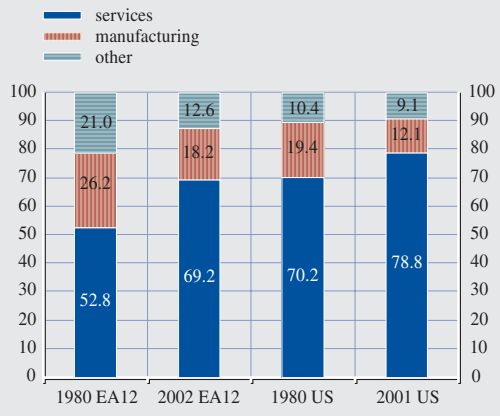
2.1.1 THE SHIFT TO SERVICES

The increase in the share of services in total value added and employment is one of the important economic trends of the last decades. This trend is visible in the euro area countries as well as in the United States. The services sector in the euro area represented about 69% of total employment and 71% of total nominal value added in 2002. In the US, the shares of the services sector in employment and nominal value added in 2001 were about 79% and 77%, respectively. Data for 2004, which are available at the aggregate level, indicate a further increase

7 Prepared by João Amador.

Chart 2 Employment structure in the euro area and the United States

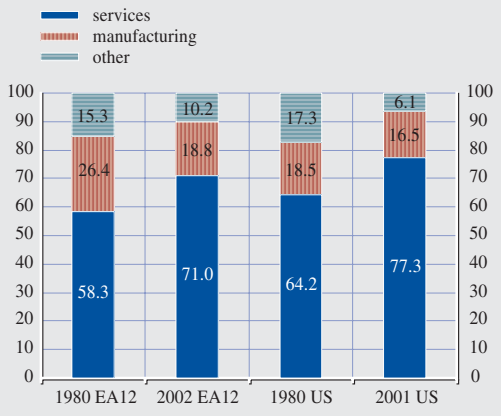
(percentages)



Sources: OECD Structural Analysis (STAN) database, Groningen Growth and Development Centre (GGDC) database and national central banks (NCBs).

Chart 3 Value added structure in the euro area and the United States

(percentages)



Sources: OECD STAN database, GGDC database and NCBs.

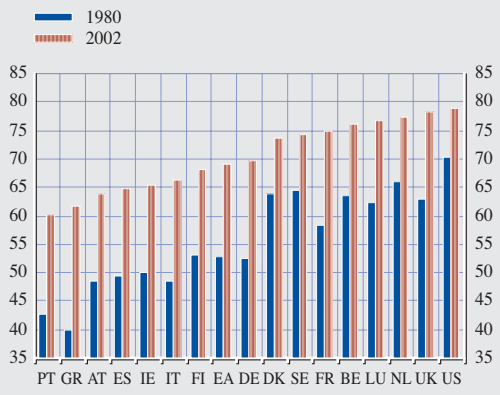
in the share of services in the United States to more than 79% of nominal value added, and a corresponding share of slightly above 71% in the euro area. In addition, it is worth noting that during the last two decades these shares recorded important increases. From 1980 to 2002 the increases in the share of services in employment and in value added in the euro area were about 16 and 13 percentage points, respectively, while in the US from 1980 until 2001 they were about 9 and 13 percentage points, respectively (see Charts 2 and 3).

Although using nominal values to compare shares is common in the literature (see Wölfl, 2003), since inflation in services is generally higher than in the total economy (see Section 2.2.3), the share of services in value added is higher when measured at current prices than when measured at constant prices.

The structural change associated with the shift to services has gone the furthest in the countries where it started earlier, namely the United States (see Charts 4 and 5). There is some

Chart 4 Share of services employment

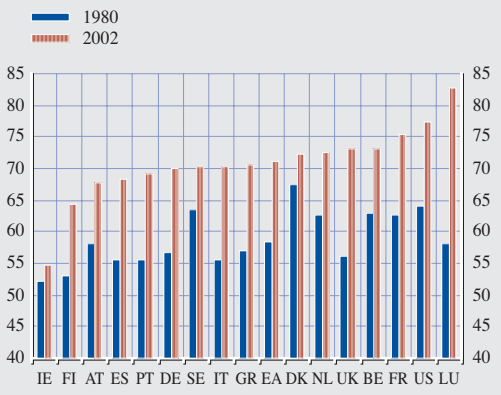
(percentages)



Sources: OECD STAN database, GGDC database and NCBs.

Chart 5 Share of services value added

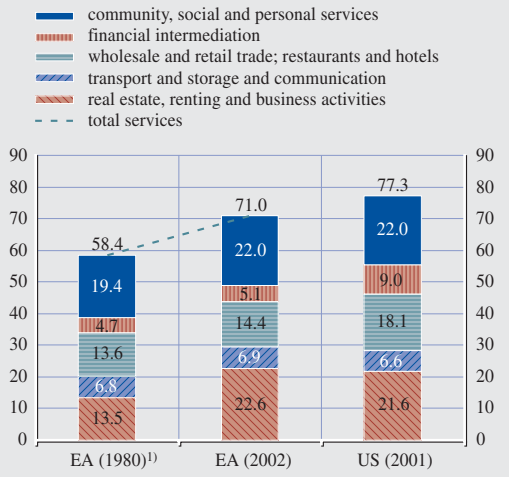
(percentages)



Sources: OECD STAN database, GGDC database and NCBs.

Chart 6 Value added share of services sub-sectors in the euro area and the United States

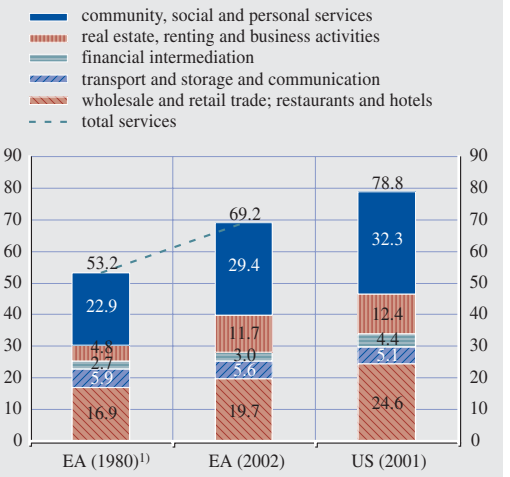
(percentages)



Sources: OECD STAN database, GGDC database and NCBs.
1) The euro area aggregate does not include Greece.

Chart 7 Employment share of services sub-sectors in the euro area and the United States

(percentages)



Sources: OECD STAN database, GGDC database and NCBs.
1) The euro area aggregate does not include Greece.

evidence of convergence amongst countries with respect to the share of services in employment, as the cross-country unweighted standard deviation has declined steadily since the late 1970s. As for the share of services in value added, there is no evidence of convergence. After some reduction in the observed unweighted standard deviation from the late 1970s to the late 1980s and a rough stabilisation from the late 1980s to the mid-1990s, there was an increased dispersion in the last years mainly due to the strong increase in services value added shares in the US, Italy, Greece, Germany, Portugal and the United Kingdom and smaller increases in Ireland, Sweden, Denmark and Austria. The different paths of employment and value added in the services sector bear consequences for labour productivity growth, which are discussed in the next section.

Taking a disaggregated sector approach, "real estate, renting and business activities", as well as "community, social and personal services", typically represent the largest components of services value added in the euro area countries. The sub-sectors "wholesale and retail trade; restaurants and hotels", "transport and storage and communication" and "financial intermediation" occupy the following positions (see Chart 6). As for employment shares, the ranking is different. The "community, social and personal services" represent almost one-third of total employment in services, followed by the "wholesale and retail trade; restaurants and hotels" sub-sector with a share of about one-fifth. The sub-sectors "real estate, renting and business activities", "transport and storage and communication" and "financial intermediation" occupy the next positions (see Chart 7).

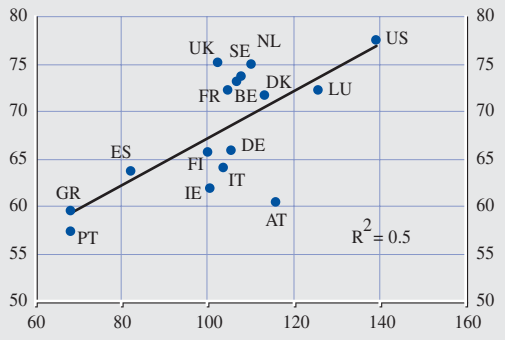
The figures for the "business services" sub-sector, i.e. total services excluding the "community, social and personal services", are usually reported as an imperfect proxy of the private sector services. The shares of "business services" employment in the euro area in 2002 and in the United States in 2001 are about 40% and 46%, respectively. As for the share of "business services" in overall value added, the figures for the euro area and the US are 49% and 55%, respectively.

Additional observations regarding countries are worth making. Firstly, the importance of the services sector in value added and employment seems to be positively correlated with income

Chart 8 GDP per capita versus the share of services in employment

(average 1991-2003)

x-axis: GDP per capita (PPS) as a percentage of euro area average
y-axis: share of services in employment

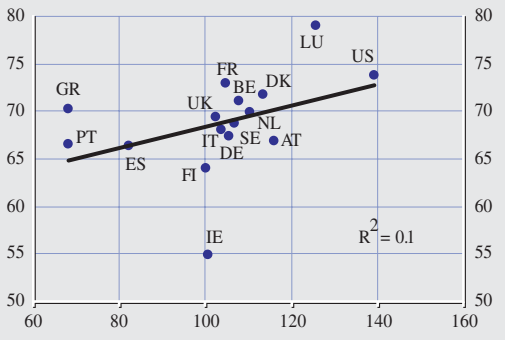


Sources: OECD STAN database, GGDC database, NCBs and European Commission annual macroeconomic (AMECO) database.
Notes: Data for Greece, average 1996-2003; data for Ireland, average 1991-2002; data for Luxembourg, GDP per capita adjusted for commuters.

Chart 9 GDP per capita versus the share of services in value added

(average 1991-2003)

x-axis: GDP per capita (PPS) as a percentage of euro area average
y-axis: share of services in value added



Sources: OECD STAN database, GGDC database, NCBs and European Commission AMECO database.
Notes: Data for Greece, average 1996-2003; data for Ireland, average 1991-2002; data for Luxembourg, GDP per capita adjusted for commuters.

per capita levels (see Charts 8 and 9). This positive correlation is robust for different time periods and it is tighter for the employment share than for the value added share. Secondly, Finland, and to a lesser extent Sweden, stand out because they show average increases in the share of services employment and value added, together with a strong increase in the share of manufacturing in value added. Finally, Ireland is noticeable because it shows a small increase in the share of services in total value added. This is due to the more recent and very strong development of chemicals and ICT sectors, which are characterised by high value added.

2.1.2 THE DRIVERS OF THE SHIFT TO SERVICES

The changes in the structure of employment and value added associated with the shift to services discussed in the previous section are very important and it is therefore necessary to understand the factors accounting for these changes. Several not necessarily alternative explanations have been presented in the literature.

The first explanation for the increased importance of services was initially proposed by Clark (1951), who argued that services satisfy higher needs than goods, according to the so-called "hierarchy of needs" hypothesis.[8] According to this hypothesis, income growth leads to a higher share of income spent on the purchase of services, which would explain the higher share of services value added and employment in higher-income countries (see Charts 8 and 9).

This interpretation was challenged by Baumol (1967, 2001), who argues that the increase in the share of services in employment is the result of a differential of productivity growth. Baumol disagrees with Clark by arguing that, when measured at constant prices, the relative demand for services does not depend on income. Nevertheless, since services sector productivity increases less than manufacturing productivity, the share of employment in services is higher in high-income countries. In addition, if wages evolve closely across sectors, not reflecting the differences in productivity growth, the share of services in nominal value added will also rise

8 Standard microeconomic theory formalises this hypothesis by assuming that services are superior goods, i.e. the demand-income elasticity exceeds one.

with income. These two theories should be seen as complementary as both provide explanations for the increased shares of services employment and value added. The empirical controversy seems to hinge on the overall demand-income elasticity of services. However, the empirical evidence shows that within the services sector there are cases of elasticity both higher and lower than one.

A third explanation relates to the increased participation of women in the labour market (Jacobs, Shipp and Brown, 1989, and Cancedda, 2001). In the past, social conventions led the majority of women to work at home on domestic activities, thus not being accounted for in either employment or value added statistics. The increased participation of women in the labour market implied some shifting of household to services activities, increasing the share of services in total employment and value added.

A fourth explanation for the increased share of services in value added is associated with liberalisation and globalisation (Nicoletti, 2001). It is clear that market liberalisation in services sectors such as air transport, trucking and rail transportation, coupled with increased use of ICT in some sub-sectors, has led to higher efficiency and quality. In addition, the globalisation process is associated with a large expansion of tourism and telecommunications, largely contributing to increase their share of employment and value added (see Box 2).

A fifth explanation for the shift to services relates to social preferences and the role of the public sector in the economy (Wagner, 1958, Meltzer, Scott and Richard, 1981, and Handler, Koebel, Reiss and Schratzenstaller, 2005). As national income levels increase, the size of the general government tends to increase as a percentage of GDP. This is equivalent to considering public services as superior goods, whose provision is determined by social preferences. In the 1980s, this could also partly account for the increased share of services in employment and value added in some euro area countries.

This secular trend towards an increasing importance of the services sector in the overall economy is likely to continue.

It is also worth stressing that due to the reorganisation of production across sectors in the economy and to rapid technological changes, the distinction between services and manufacturing may in some cases be complicated (see also Annex 2 for a discussion and Abraham and Taylor, 1996, and Yu, 2003). By way of example, a large number of workers employed by a car manufacturing company could be involved in typical non-manufacturing tasks similar to services activities (such as customer care, leasing activities or marketing). Moreover, the organisation of production within firms has been shifting and it is acknowledged that some activities are performed more efficiently and cheaply through outsourcing (see Box 2 for a discussion on this topic). An example could be a carmaker outsourcing cleaning services to a specialised company. As this phenomenon evolves, the shares of value added and employment in the services activities tend to increase. This is the result of the reallocation of activities between sectors in the economy and not a change in the type of activities that are actually carried out in the economy. Nevertheless, there are certainly important effects in terms of competition and the functioning of the labour market, with potential consequences for productivity and prices.

2.2 KEY FACTS REGARDING LABOUR PRODUCTIVITY AND INFLATION IN THE SERVICES SECTOR[9]

This section starts with a description of key facts regarding labour productivity growth (Section 2.2.1) and value added price changes (Section 2.2.2) in the period 1981-2003 for the individual euro area countries, the euro area as a whole, the United Kingdom, Denmark, Sweden and the United States. The data refer to the aggregate economy, total manufacturing and all the services sectors. A more detailed

9 Sections 2.2.1 and 2.2.2 prepared by Moreno Roma; Section 2.2.3 prepared by David Cornille.

description of the data and the construction of the variables used in these sections is provided in Annex 1. The period considered has been divided into two sub-periods: 1981-1990 (referred to as the 1980s in the text) and 1991-2003 (referred to as the 1990s in the text); in addition, the most recent part of the second sub-period (from 1996 to 2003) is also considered separately. The latter period 1996-2003 has been chosen for two reasons: first, labour productivity growth in the majority of the euro area countries has decreased compared with the beginning of the 1990s; and, second, the period almost includes a full cycle including the peak of 2000 and the trough of 2003.

In Section 2.2.3 consumer price developments in the services sector are analysed, using the Harmonised Index of Consumer Prices (HICP) database, over the period January 1996 to July 2005, which also comprises the most recent part of the second sub-period mentioned above.

It should be mentioned that it has not been possible to include services sector price level data in the analysis because such data are unfortunately quite scarce and because it is generally not feasible to establish a correspondence with the other dataset used in this report.[10]

Caveats concerning the difficulties of measuring value added and prices in the services sector must be borne in mind and caution is required when interpreting developments in labour productivity, value added price changes and HICP developments in the services sector (see Annex 2 for a discussion of selected measurement issues concerning international labour productivity and price comparisons for services).

2.2.1 LABOUR PRODUCTIVITY

Labour productivity growth is computed as gross valued added at constant prices divided by total employment (in terms of the number of persons). Table A.5 in Annex 4 confirms the well-known finding of a labour productivity growth slowdown in the euro area and in the majority of the euro area countries since the 1990s for the aggregate economy. Labour productivity growth decreased in the 1990s relative to the 1980s (and a stronger decrease took place in the most recent sub-period 1996-2003) in all euro area countries except Germany, Ireland and Greece[11] (see Chart 10). These developments sharply contrast with the acceleration of labour productivity in the United States since the 1980s.

The slowdown in labour productivity growth relative to the 1980s also takes place for total services (see Table 1), both for the euro area as a whole and for most of the euro area countries (except Italy, Belgium and Germany). Conversely, labour productivity growth rates in total services in the United States picked up considerably in the 1990s compared with the 1980s, surpassing the euro area, and increased further in the 1996-2003 period.

The existence of a positive gap between labour productivity growth in total manufacturing and in total services is a general feature across the countries examined and over time, which may also be linked to the very nature of services. In particular, services cannot be stored, implying that a major difference with respect to goods is a limited possibility to exploit economies of scale in the services sector, even if technological advances may have alleviated this problem. In a seminal paper, Baumol (1967) stressed the possible long-term consequences of unbalanced growth between a productive manufacturing sector and an unproductive or stagnant services sector. The argument was that increasingly unbalanced growth across sectors induces resource reallocation towards industries characterised by slow or zero growth, which might eventually slow down aggregate

10 Eurostat Price Level Indices cover disaggregated data for some services. However, only a limited number of categories refer to services only, whilst other categories refer to both goods and services.

11 Data for Greece prior to 1996 are not presented in the report, but the increase in labour productivity growth in the 1990s, and especially from the second half of the decade onwards, is documented elsewhere (see, for example, European Commission, 2005a).

Chart 10 Labour productivity growth over time in the EU15, the euro area and the United States

(percentages)

Sources: OECD STAN database, GGDC database, NCBs and own calculations.

productivity growth. The labour productivity growth gap between the manufacturing sector and the services sector has however narrowed considerably over time both in the euro area and the United States. Moreover, some services industries experience high labour productivity growth, suggesting that a high degree of heterogeneity exists within industries in the services sector. As a consequence, Baumol's argument appears to be oversimplistic (see also Wölfl, 2003, for a discussion). In particular, notwithstanding significant differences across countries and over time, labour productivity growth in the services sector seems to be characterised by industries experiencing relatively strong productivity growth, such as post and telecommunications and financial intermediation, and by sectors with weak or even negative labour productivity growth, such as hotels and restaurants, real estate, renting and business activities, and community, social and personal services (see Table A.5 in Annex 4). This feature is shared by the majority of countries examined and is seen over time.

Analysing in more detail the evolution of labour productivity growth in some services industries, divergent dynamics between the euro area countries and the United States, the United Kingdom and the Scandinavian countries emerge especially in the wholesale and retail trade sector. The increase in labour productivity in this services industry is much smaller in the euro area than in the US, the UK and the Scandinavian countries (Denmark, Sweden) across all time periods considered and labour productivity growth in this services industry has decreased considerably since the 1990s in the euro area compared with the US. However, considerable heterogeneity exists also within the euro area, with the wholesale and retail trade sector in France, Finland, Austria, Belgium and Luxembourg performing better than the euro area average in the 1990s.

Negative labour productivity growth in real estate, renting and business activities is recorded both in the euro area and in the United States across all three time periods considered, but developments in the US since the beginning of the 1990s have been more favourable than in the euro area. Low or negative productivity growth in this industry may also be due to measurement issues which could be specially relevant in this industry due to its heterogeneous and multi-service nature (Diewert and Fox, 1999) and in real estate due to the fact that much output in this sector is imputed (Wölfl, 2003). Wolff

(1999) argues that professional workers often provide customised services, making their output particularly difficult to measure. Moreover, negative labour productivity growth in real estate, renting and business activities might also be related to labour-intensive production and small average firm size (see Sections 3.3.3 and 4.8 for a discussion). Small firms, for instance, may not be able to fully exploit economies of scale and could lack the financial ability to invest in new technologies. Limited firm size could also exacerbate problems of information asymmetry and credit constraints.

Negative labour productivity growth in hotels and restaurants is recorded across the majority of countries and could also be related to this sector's labour-intensive character, domestic orientation and mostly small firm size and to the presence of the underground economy in this industry.[12]

Labour productivity growth in transport and storage and communication in the euro area is above that in the United States in all the time periods considered and this gap widened in the 1996-2003 period. For a discussion, see Sections 4.6 and 4.7.

Data limitations regarding the availability of hours worked in the services sectors limit the scope of the analysis of labour productivity per hour worked. However, data for labour productivity per hour worked in the period 1996-2002 (see Table A.6 in Annex 4) seem to broadly confirm the findings discussed for productivity per person employed. In particular, at the aggregate level and for business services productivity growth per hour is lower in the euro area than in the United States, but the gap is somewhat reduced due to a lower number of total hours worked in the euro area than in the US (the gap shrinking from close to 2.6 percentage points to close to 2.0 percentage points in business services in the 1996-2002 period). Transport and storage and communication is also confirmed to be a very dynamic sector, with productivity growth per hour worked in the euro area exceeding that in the US. At a country level, it is interesting to point out the higher productivity growth per hour in France across the board compared with productivity growth per worker, due to a progressive reduction of hours worked with the introduction of the 35-hour working week. For the total economy and business services, the growth rate of labour productivity per hour in the 1996-2003 period in France is approximately twice that of labour productivity per worker. For all other euro area countries, differences are generally much more limited.

The level of total economy labour productivity[13] across euro area countries varies significantly across countries in the period 1996-2002,[14] ranging from 146 in Luxembourg to slightly above 60 in Portugal (euro area average = 100). A similar pattern emerges for the level of total services sector labour productivity (see Chart 11). Substantial heterogeneity across countries, reflecting inter alia catching-up phenomena, real GDP per capita and a different composition of economic activity, is observed in all the services industries analysed. The level of euro area labour productivity in the 1996-2001 period was around 81% and 86% of the US level for the total economy and total services, respectively (see Chart 12). The relative level of euro area labour productivity compared with the US slightly decreased in the second half of the 1990s in all services sectors considered relative to the 1991-2001 average, with the exception of transport and storage and communication. In particular, the relative level of labour productivity in total services declined from close to 88% in the 1991-2001 period to

12 In the case of Germany, the negative labour productivity growth recorded in the 1990s could be partly reduced by making use of chain-linked data for real value added from the national statistical office rather than the OECD STAN database. However, using these data would pose a problem in the computation of higher-level productivity aggregates for Germany.

13 Computed as the gross valued added level at constant prices divided by total employment in persons. Productivity levels are PPP-adjusted using GDP PPP data for 1995. Sectoral productivity levels are adjusted using the aggregate GDP PPP data for 1995, given that PPP-adjusted data at the sectoral level are not available. Sectoral results should therefore be interpreted with caution.

14 Similar considerations hold for the 1991-2002 period.

Table 1 Labour productivity growth and value added price changes

(percentages)

Average labour productivity growth, total services

	BE	DE	GR	ES	FR	IE[1]	IT	LU	NL	AT	PT	FI	DK	SE	UK[1]	EA	US[6]
1981-1990	0.79	1.03	-	0.43	1.39	1.56	0.14	3.27	0.95	1.12	1.68	1.63	0.84	0.88	5.54	0.90[3]	0.61
1991-2003	0.83	1.15	-	0.13	0.59	1.29	0.43	0.56	0.44	0.49	0.92	1.00	1.12	1.33[2]	2.24	0.69[4]	1.57
1996-2003	0.45	0.94	1.45	0.14	0.66	2.05	0.06	0.07	0.59	0.12	0.97	0.50	1.08	0.84	1.38	0.59[5]	2.33

Average value added price changes, total services

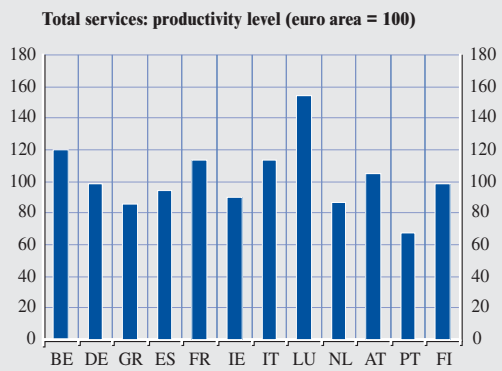
	BE	DE	GR	ES	FR	IE[1]	IT	LU	NL	AT	PT	FI	DK	SE	UK[1]	EA	US[6]
1981-1990	4.93	2.79	-	9.98	6.55	8.33	11.31	3.88	2.16	4.24	17.34	7.70	6.52	7.68	2.81	6.27[7]	5.24
1991-2003	2.60	1.62	-	4.90	2.03	4.57	3.86	4.45	2.76	2.21	5.23	2.72	2.17	3.07	2.96	2.49[7]	2.55
1996-2003	2.16	0.26	4.51	3.82	1.91	5.51	3.06	3.75	2.76	1.30	3.72	2.44	1.76	2.64	3.49	1.90[8]	1.94

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) The data refer to the period up to 2002.
2) The data refer to the period 1994-2003.
3) The euro area aggregate does not include Greece.
4) The euro area aggregate does not include Greece and includes Ireland only up to 2002.
5) The euro area aggregate includes Ireland only up to 2002.
6) The data refer to the period up to 2001.
7) The euro area aggregate does not include Greece or Ireland.
8) The euro area aggregate does not include Ireland.

83% in 2001, indicating that the long-run catching-up process of the euro area towards higher productivity levels was interrupted, also due to the integration of low-skilled workers into the labour market (ECB, 2002c). The fall over time in the relative level of euro area labour productivity compared with the US was particularly sharp in the wholesale and retail sector.

Chart 11 Labour productivity levels in the euro area countries relative to the euro area average

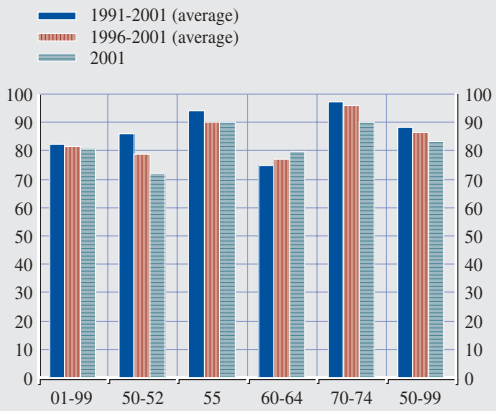
(euro area = 100; 1996-2002; averages)



Sources: OECD STAN database, GGDC database, NCBs and own calculations.

Chart 12 Labour productivity levels in the euro area relative to the United States

(percentages)



Sources: OECD STAN database, GGDC database, NCBs and own calculations.
Notes: 01-99 = grand total, 50-52 = wholesale and retail trade, 55 = hotels and restaurants, 60-64 = transport and storage and communication, 70-74 = real estate, renting and business activities, 50-99 = total services.

2.2.2 VALUE ADDED PRICE CHANGES

Table A.7 in Annex 4 shows a clear decreasing pattern in the total economy value added price changes in the majority of the euro area countries (with the exception of the Netherlands and Luxembourg[15]) since the beginning of the 1980s. This well-known phenomenon of progressive disinflation was also generally associated with an increased commitment of authorities to fight inflation, the implementation of sounder fiscal policies and the fall in crude oil prices since the mid-1980s.

The decrease of the value added price changes over time observed for the total economy occurred also for total services (see Table 1) and for the majority of industries comprising services and was common across the euro area countries (again with the exception of the Netherlands and Luxembourg), the US, Sweden and Denmark.

The following points, which will also be elaborated upon in the rest of the report, are worth mentioning. First, the average value added price changes for hotels and restaurants are significantly higher than for total services for all the periods considered (4.7% compared with 2.5% for the euro area in the 1990s). This feature is shared by all the euro area countries (with the exception of Finland from the 1990s) and most of the non-euro area countries examined, and it may be related to a smaller scope for productivity improvement in this labour-intensive services sector, which is also related to the difficulty of measuring quality improvements. Second, whilst average value added price changes in the wholesale and retail trade in the euro area show similar developments over time as for total services, the US experienced negative value added price changes for this sector in the 1996-2003 period, reflecting better productivity performance (for a discussion, see Section 4.4). Third, the value added price changes in post and telecommunications recorded a sharp fall over time in the majority of countries, especially since 1996 in the case of Germany, France and the Netherlands. This is related to the opening-up of the telecommunication sector to competition since the mid-1990s in the majority of euro area countries (see Section 4.7 and ECB, 2001, for a discussion). The US has experienced a more moderate fall in this deflator since 1996. Fourth, the value added price changes in real estate, renting and business activities in the euro area are higher than for total services for all the periods considered. The reasons differ across individual sub-sectors. In the real estate and renting sector, the value added price changes may be attributable to the increase in prices of underlying assets, while in professional services they are associated with the growing heterogeneity and quality of the provided services.

2.2.3 CONSUMER PRICE (HICP) DEVELOPMENTS IN THE SERVICES SECTOR

This section focuses on the services component of the Harmonised Index of Consumer Prices, or HICP, which is at the heart of the definition of price stability in the context of the ECB's monetary policy. As expected, the main trends observed for value added price changes in the services sector are broadly similar to consumer price developments. Indeed, the HICP reflects value added prices, but it also reflects the evolution of the other constituents of final consumption prices, i.e. taxes on consumption, the prices of other inputs and the prices of imported products directly consumed (the latter not really being relevant for most services).

The HICP services component is an aggregate of five services groups or categories: "communication services", "housing services" (not including imputed rents for owner-occupied housing[16]), "recreation and personal services"

15 In the case of Luxembourg, a relatively high increase of value added services prices is not necessarily an unfavourable evolution. As services produced in Luxembourg are to a large extent exported (and not consumed domestically), increasing value added prices may hint at a favourable evolution of export prices. This view is supported by the fact that consumer price inflation in the services sector in Luxembourg was, between January 1996 and July 2005, lower than in six other euro area economies (see Table A.9 in Annex 4).

16 Imputed rents for owner-occupied housing are instead included, together with actual rents, in the calculation of value added price changes for sector 70-74 (real estate, renting and business activities).

(including hotels and restaurants, package holidays, etc.), "transportation services" and "miscellaneous services". The latter comprises the sectors which will be excluded from the analysis in the next chapters (see Boxes 3 and 4). The analysis is restricted to the period January 1996-July 2005, i.e. the period for which annual inflation rates could be computed in a harmonised fashion for all the euro area countries and all the components considered.

Importance of services components in the HICP

The weight of services in the euro area HICP was 41% in 2005 (see Table A.8 in Annex 4), which is less than the value added or employment share of services (see Section 2.1). The difference is mainly attributable to two factors. First, many services are intermediate inputs for businesses, so an important share of services is in fact embodied in the prices of non-services items of the HICP. The most obvious examples are wholesale and retail services: their margins are incorporated in the price of the goods sold to customers. Second, some non-market services imply no monetary transaction and are thus not included in the HICP since the share of the households' final monetary consumption expenditure (HFMCE) for these is zero.[17]

Within the services component, the five services groups or categories have the following relative weights: "housing services" and "recreation and personal services" together account for around 60% of the services aggregate. "Transportation services" and "miscellaneous services" each account for slightly more than 15%, while the weight of "communication services" is around 7% of the total services component.

The most important component of "housing services" is "actual rents for housing". For the euro area as a whole, the latter represent approximately 60% of this category. However, the HICP only includes actual rents. Owner-occupied housing costs are not (yet) included in the HICP. This can have an impact on the comparison between countries because in countries where the share of renters is very high (like in Germany), the weights of rents and hence of total services is much higher than in countries where home ownership is more developed, like Portugal, Italy and Spain. Indeed, important differences can be seen between countries, the weights of rents varying from 5% of total services in Portugal to 25% in Germany.

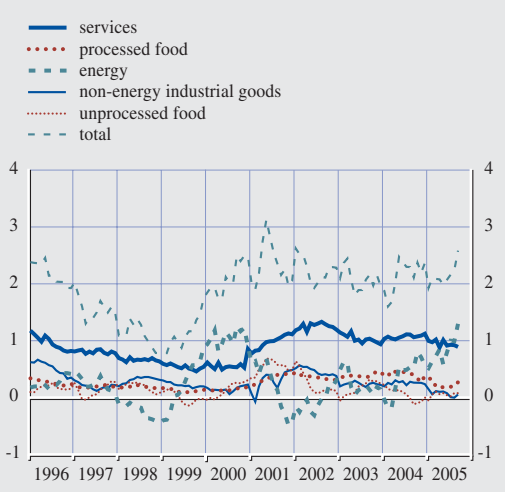
Contribution of services inflation to aggregate HICP inflation

Chart 13 gives the contribution of the services component to overall HICP inflation in the euro area. In light of its pronounced weight in the HICP, it is not surprising that this contribution has been substantial. This contribution is further strengthened by the fact that services inflation is on average higher than aggregate inflation. This is shown in Table A.9 in Annex 4 for the period January 1996 to July 2005. While euro area aggregate inflation amounted to 1.9% on average during the period considered, average

17 The HFMCE is indeed the basis for inclusion in the HICP. In other cases, the monetary transaction only reflects a part of the total service provided and consequently only this part is recorded in the HICP. This is the case for health, education, social protection services and insurance services, where the price reflects the net amount paid by consumers, i.e. minus the reimbursement (social transfers in kind).

Chart 13 Contribution of services to aggregate HICP inflation

(percentage points)



Source: Eurostat.

services inflation stood 0.4 p.p. higher at 2.3%. On the basis of annual averages, higher services inflation has been observed continuously since 1996, except in the year 2000 when services inflation was reduced by particularly large price decreases in communication services and by low rent increases, while aggregate inflation was pushed up significantly by energy prices. When splitting the sample into two sub-periods (1996-2000 and 2001-2005), it is found for both sub-periods that services inflation exceeds aggregate inflation (see Tables A.10 and A.11 in Annex 4). Note, however, that the difference is not substantially higher during the second sub-period, with higher aggregate inflation than during the first sub-period.

Apart from "communication services", all services components contribute to this positive inflation differential. While the difference has more or less the same magnitude for "housing services", "recreation and personal services" and "transportation services", it is more pronounced for "miscellaneous services". This very heterogeneous group comprises predominantly financial services and non-market services, such as medical services, education and social protection. It therefore corresponds to a large extent to the services that are "excluded" from the analysis in this report from Chapter 3 onwards (see Box 4). In other words, the excluded services are also those witnessing the highest price increases over the period considered. Their contribution to aggregate inflation also seems more pronounced during the second sub-period than during the first, but the comparison is complicated by the poor coverage of this HICP component during the first sub-period (in particular for medical services).

As to "communication services", price decreases of approximately 2% a year are observed on average. Price decreases for this component are consistently found across countries. At first sight they are attributable to technical progress, which increased productivity, and to deregulation and market liberalisation of this sector.[18] The most important price decreases are found for "telecommunication equipment", which is not strictly speaking a service but is included in the category in order to reflect the impact of technology on the sector. While price decreases for this component amount to approximately 9%, their contribution is not substantial given their low weight. Price decreases for telecommunication services nearly reached 3%. In contrast, the evolution of "postal services" prices is positive.

Services inflation across euro area countries

The fact that services inflation is higher than aggregate HICP inflation is consistently found at the level of the individual countries. This is also the case when the entire period is split into two sub-periods. When analysing individual years, some exceptions are observed, in particular in 1999, 2001 and 2005, probably as a result of differences across countries in the sensitivity of headline inflation to energy prices, rather than because of specificities in the services sector. It could also be the result of differences in the timing and in the magnitude of the liberalisation effect for telecommunications.

The difference between aggregate inflation and services inflation (see Table A.9 in Annex 4) exceeds 1 p.p. in Portugal, Ireland and Greece. Finland, Spain, Austria, the Netherlands and Italy occupy an intermediate position in this respect, as their differential for services inflation ranges from 0.6 to 0.9 p.p. The difference is smallest (around 0.3 p.p.) in Germany, France, Luxembourg and Belgium. It should be mentioned that for countries where the difference between aggregate and services inflation is the largest, the result for Greece is highly influenced by the period before 2000, whereas the result for Ireland is rather influenced by the period after 2000. For the other countries, the relative position is more stable.

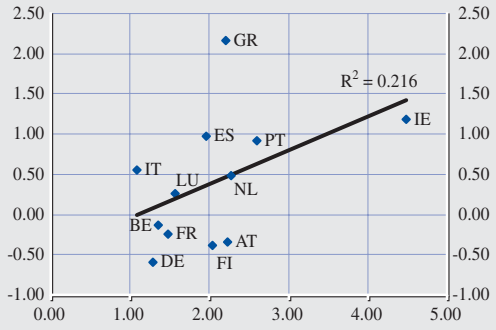
Chart 14 compares for each country the difference between services inflation and non-energy industrial goods inflation, on one hand,

18 See ECB (2001) and Martin et al. (2005).

Chart 14 Difference between services and non-energy industrial goods inflation and aggregate HICP inflation differentials in the euro area

(percentage points; January 1996 to July 2005)

x-axis: difference between services and non-energy industrial goods inflation
y-axis: inflation differentials compared with the euro area



Sources: Eurostat and own calculations.

with its aggregate HICP inflation differential vis-à-vis the euro area, on the other. A positive difference between services inflation and non-energy industrial goods inflation reflects, amongst other factors, the non-tradability of some services, which limits arbitrage possibilities compared with non-energy industrial goods. The correlation between both differences is positive,[19] suggesting that services inflation is one important factor behind aggregate inflation differentials in Monetary Union.

Evolution of services inflation during the period 1996-2005

While the contribution of services inflation in the euro area was relatively stable and even moderately decreased during the pre-2001 period, it increased sharply in 2001 and in the first half of 2002. Thereafter, some decreases are observed, particularly during the last quarter of 2002, the first quarter of 2003 and the first quarter of 2005, but the contribution of services inflation clearly stays at a higher level than in the period 1996-2000 (see Chart 13).[20] This motivated the splitting of the sample into two sub-periods: 1996-2000 and 2001-2005. During the first sub-period, services inflation amounted to 2%, while it stood at 2.6% during the second sub-period (see Tables A.10 and A.11 in Annex 4). Note, however, that the difference between services inflation and aggregate inflation did not fundamentally change from one period to the other. This pattern is more or less consistently observed at the level of the individual euro area countries as well as for Denmark, Sweden and the UK. For most of the countries, services inflation is higher in the second sub-period, except for Greece (which did not belong to the euro area before 2001), and, to a lesser extent, for Italy.[21]

A similar relatively homogeneous pattern is found across the major services components. For all of them, price increases were more pronounced (or price decreases less pronounced) in the second sub-period, except for "housing services" and some sub-items within other categories, for instance "telecommunication equipment" (within "communication services"), "other purchased transport services" (within "transportation services") and "repair of audio-visual, photographic and information processing equipment" (within "recreation and personal services").

In view of their relatively important share in the consumption basket, it is particularly relevant to observe that euro area inflation for "housing services" did not increase from one period to the next. On the contrary, while it amounted to 2.6% during the first sub-period, it decreased to 2.3% during the second. Within "housing services", this deceleration is mainly the result of the price evolution for "actual rents for housing". In the light of the increasing property prices, this is striking but not implausible as the

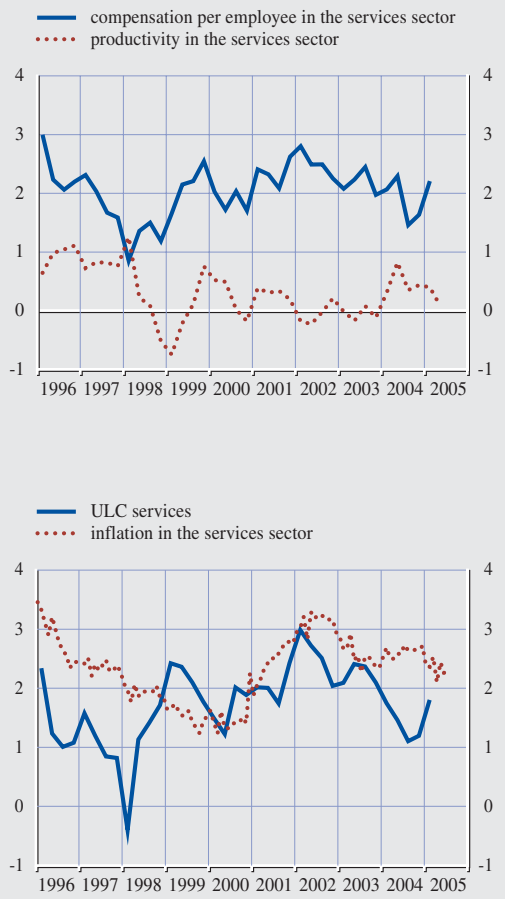
19 Results are confirmed omitting Ireland and Greece (the R-squares slightly decrease). A panel regression on the basis of annual data for each country suggests that the relationship is statistically significant.

20 In December 2000, the sudden but temporary increase of services inflation is due to the components "package holidays" and "accommodation" in Germany (increases of more than 25%). This is due to the inclusion in the December index of the much more expensive Christmas accommodation and package holidays from 2000 onwards, whereas this was not the case before.

21 It is also worth mentioning that a sharp deceleration in services inflation in the most recent part of the second sub-period considered, i.e. from 2003 onwards, has been recorded in some euro area countries such as Portugal and Ireland.

Chart 15 Labour costs as determinants of services inflation in the euro area

(annual percentage changes)



Sources: OECD STAN database, GGDC database, NCBs, European Commission and own calculations.

observed evolution may be the result of an important compensating effect stemming from the decrease in interest rates and/or the existence of regulations, which tend to isolate the rental market to some extent from developments in the property market.[22] Note also that an important factor behind the increase in services inflation, namely wages (see below), is not an important cost factor for housing rents.

"Communication services" show an analogous pattern, as euro area price decreases are less pronounced during the second sub-sample (-1.8% compared with -2.5%), except for "telephone and telefax equipment". Apart from the factors that have contributed to the general acceleration of services inflation, this could also be due to some specific factors affecting this services category in particular, such as the slowdown of deregulation effects, the effect of which is, in principle, only of a temporary nature for inflation rates but permanent for price levels.[23]

Given the high share of wages in the cost structure of most services, the most important factor explaining the observed evolution of services inflation is probably the development of labour costs. Chart 15 illustrates the relationship between services inflation and the changes in: (i) the compensation per employee in the services sector; and (ii) unit labour costs in the services sector. While, in principle, unit labour costs are the most appropriate variable to explain inflation developments, it turns out that the difference between unit labour costs and compensation per employee is relatively small. This suggests that productivity developments have generally been rather limited in the services sector since 1996 (see Section 2.2.1).

Chart 15 shows that there is indeed a relatively strong link between services inflation and wage developments in the services sector, both over time and across countries. The strong relationship between unit labour costs and

22 See ECB (2003b).
23 See ECB (2001) and Martin et al. (2005).

services inflation justifies the introduction of these costs as an explanatory variable of services inflation in the quantitative analysis (see Chapter 4).

Slower price responsiveness in the services sector

Recent work of the Eurosystem IPN (see Section 1.2 and Annex 3) points to a slower price responsiveness in the services component compared with other inflation components, as illustrated by a lower frequency of price changes in services (see Table 2). This seems to be the case for the euro area as a whole, as well as for all euro area countries (data for Greece and Ireland are not available). Moreover, the frequency of services price changes is lower than in the US.

Another conclusion of the IPN is that, in contrast to the other inflation components, "there exists a large asymmetry between the frequency of increases and decreases [in services], as only two price changes out of ten are price decreases" (Dhyne et al., 2005).

These results suggest that wage rigidities (if indeed the development of wages is more steady than that of other input prices), as well as the relative importance of regulated prices or other restrictions on competition, are important determinants of services price developments.

Scope of administered services prices

In the services component of the HICP, there are a number of items which can be influenced to a considerable extent by "administrative" decisions. The scope of the so-called "administered prices" can vary from one country to another, as well as over time. Moreover, for those prices that are administered, the degree of effective involvement of the authorities in the price formation process can differ across countries and across products. Changes in such prices are not always well in line with the evolution of traditional cost factors and, as such, the affected products can show divergent inflation patterns. Moreover, in some cases, such price changes can be very abrupt and pronounced[24] and can therefore significantly affect comparisons across countries.

24 For instance, the changes in the radio and television licence fees in the Netherlands in 2000 and in Belgium in 2002 and 2003, and in healthcare prices in Germany in 2004.

Table 2 Frequency of price changes by product type

(percentage of products exhibiting price changes over the period under review)[1)]

	Unprocessed food	Processed food	Energy (oil products)	Non-energy industrial goods	Services	Total[2)] (country weights)	Total[3)] (euro area weights)
Belgium	31.5	19.1	81.6	5.9	3.0	17.6	15.6
Germany	25.2	8.9	91.4	5.4	4.3	13.5	15.0
Spain[4)]	50.9	17.7	n.a.	6.1	4.6	13.3	11.5
France	24.7	20.3	76.9	18.0	7.4	20.9	20.4
Italy	19.3	9.4	61.6	5.8	4.6	10.0	12.0
Luxembourg	54.6	10.5	73.9	14.5	4.8	23.0	19.2
Netherlands	30.8	17.3	72.6	14.2	7.9	16.2	19.0
Austria	37.5	15.5	72.3	8.4	7.1	15.4	17.1
Portugal	55.3	24.5	15.9	14.3	13.6	21.1	18.7
Finland	52.7	12.8	89.3	18.1	11.6	20.3	-
Euro area	**28.3**	**13.7**	**78.0**	**9.2**	**5.6**	**15.1**	**15.8**
United States	47.7	27.1	74.1	22.4	15.0	24.8	-

Source: Dhyne et al. (2005).
1) Figures presented in this table are computed on the basis of a sample of 50 products, with the sole exception of Finland, for which figures derived from the entire CPI are presented.
2) The total is calculated using country-specific weights for each item.
3) The total is calculated using common euro area weights for each sub-index. No figures are provided for Finland because of the lack of comparability of the sample of products used in this country.
4) In the Spanish database no energy products are included, which brings the aggregate frequency down.

Lünnemann and Mathä (2005) identify a basket of "regulated prices" (broadly based on ECB, 2004d), representing approximately 7% of the EU15 aggregate HICP in 2002, which all fall into the HICP category "services" (in particular, housing, communication, transportation and miscellaneous services). These items are: "refuse and sewerage collection", "medical, dental and hospitals services", "passenger transport by railway and road", "postal services", "cultural services", "education" and "social protection". The authors find that these regulated prices exhibit a higher average inflation rate than non-services and freely determined prices, larger price increases than decreases and higher inflation persistence than overall inflation.

Given the uncertainty surrounding the definition of regulated and administered prices and the fact that an analysis of these prices would go beyond the scope of this report, the rest of the report does not specifically distinguish between administered and non-administered prices.

Box 2

INTERNATIONAL OUTSOURCING IN THE SERVICES SECTOR[1]

The international outsourcing of services has recently been the topic of heated debate. Many people in developed countries fear that outsourcing is no longer confined to the traditional industry sector and, therefore, will lead to substantially lower employment among "white-collar workers". These fears have been amplified by the recent developments in information and communication technology, which enables international outsourcing of jobs previously sheltered from such competition. However, these fears are neither supported by economic theory nor by empirical evidence.[2] The aim of this box is to put the subject of international outsourcing in the services sector into perspective. As there is no unambiguous definition of outsourcing, it may be helpful to recall the meanings of the often-used phrases "offshoring" and "outsourcing" (see table below). In this box, we consider outsourcing as the procurement of services by a firm from a source in a foreign country (which may or may not be affiliated).

Table

Location	Internalised production	Externalised production ("outsourcing")
Domestic	Production kept in-house at home	Domestic outsourcing
Foreign ("offshoring")	Intra-firm offshoring to foreign affiliate	Offshore outsourcing to local or other foreign company

Source: Modified version of Table IV.1 in UNCTAD (2004) p. 148.

The extent of international outsourcing

There are several reasons to believe that only a small percentage of services sector jobs might be relocated to developing countries. Most services sector jobs cannot be outsourced, as these jobs require consumers and producers to be physically in the same place. The OECD (2005c) estimates that around 19% of total employment in the EU15 could potentially be affected by

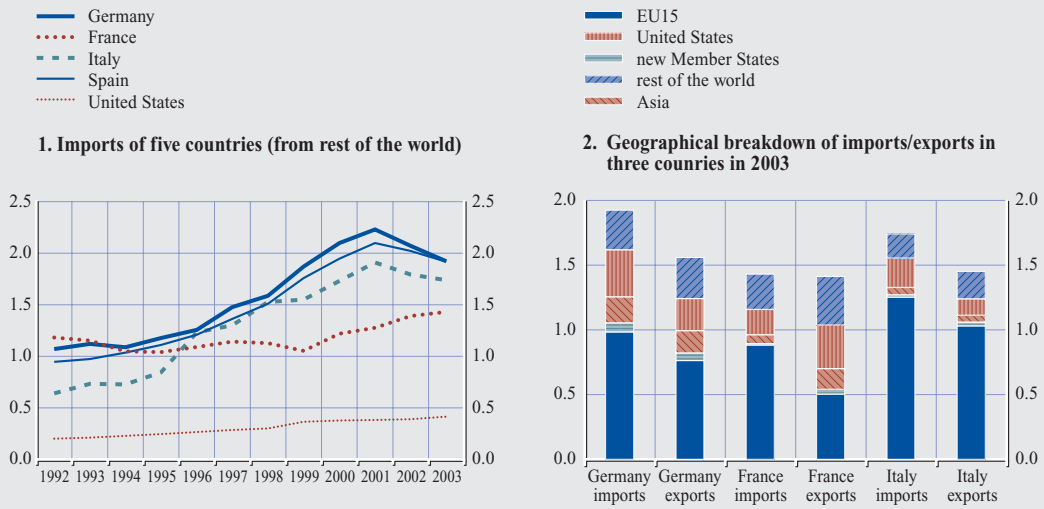
1 Prepared by Jörg Döpke and Mathijs Gerritsen.
2 For a survey of the ongoing debate, see Amiti and Wei (2004) and UNCTAD (2004) and the literature cited therein.

the outsourcing of services activities. This does not imply that all these jobs will be moved to countries such as India or China. As holds for outsourcing of industrial production, the lower (labour) costs in developing countries are often counterbalanced by higher productivity in the services sector in the developed countries. Despite technological progress, which has made outsourcing much easier, the profitability of outsourcing is therefore limited and also not without risk. For example, a survey of over 5,000 IT user companies in the US, Canada and Europe found that of the 19% which had an offshore strategy, only 45% said it was a success, while 36% claimed it failed (Eurofound, 2004). Furthermore, companies take other factors into account, such as access to skilled labour (workers often have to speak the same language as in the parent company), suppliers or market access, when determining where to outsource certain operations. Most international investments therefore take place between countries with a similar level of economic development. In contrast to outsourcing, there is also substantial "insourcing" in developed economies, which creates new jobs in the receiving countries.

Not surprisingly, studies which try to measure the effect of the international outsourcing of services conclude that the economic impact of outsourcing appears to be small. As there is no direct information on which parts of the production stages are contracted out, studies draw on management information (obtained through interviews), anecdotal evidence or various macroeconomic proxies (like data on trade in services or related employment data; see e.g. van Welsum, 2004). Those studies conclude that the potential job losses are negligible compared with the regular job turnover and modest compared with the outsourcing of goods (see, for example, Amiti and Wei, 2004, and OECD, 2005c). However, it looks like outsourcing in the services sector is growing. This trend is seen by management studies and can also be observed in some macroeconomic indicators. For example, imports of "computer and information services" plus "other business activities" as a percentage of GDP are steadily increasing in most euro area countries (see part 1 of the chart).[3] This figure, however, is likely to give the upper bound of the amount of outsourcing, since the imports also include imports from other industrial

Imports and exports of computer and information services plus other business services

(percentages of GDP)



Source: Eurostat.

3 These imports are likely to include intermediate inputs rather than consumer goods (see also Amiti and Wei, 2004).

countries. Part 2 of the chart shows that outsourcing contrasts with a substantial volume of "insourcing" and that only a fraction of the imports are coming from lower-wage countries.

Despite the fact that the extent of potential international outsourcing seems to be limited, it is noteworthy that particular sectors of the economy may be affected by this phenomenon in a more substantial way. Bardhan and Kroll (2003) list some characteristics of services jobs that may have a higher risk of being internationally outsourced, such as no face-to-face customer service requirement, high information content, high wage differential to destination country and low set-up barriers. Consequently, the process of outsourcing, while welfare-increasing in the long run, is not without short-run frictions that may give rise to social conflicts.

What happens when international outsourcing is increasing?

There are no reasons to believe that with its growth, the effects of services outsourcing will become negative. In fact, the continuous process of international specialisation can be mutually beneficial for the involved countries as a whole. As Bhagwati et al. (2004) state, outsourcing is just a trade phenomenon, and its effects are not different from conventional trade in goods. As mentioned, studies seeking to determine the impact of outsourcing in the services sector found its effect on the employment level to be negligible. In short, although individuals could face negative effects of the reallocation, it appears that for every job eliminated, a new job (often in another sector) is created. This is also likely to happen when outsourcing takes place on a larger scale. Nevertheless, the benefits of outsourcing seem to differ from one country to another depending on the capacity of each economy to react to economic changes. An often-quoted McKinsey study is illustrative in this regard, although its results should not be interpreted at face value. McKinsey (2004 and 2005) estimates that, for every dollar spent on outsourcing in the services sector, the US economy as a whole gains USD 1.14 to USD 1.17, while France and Germany only receive USD 0.86 and USD 0.80 respectively. According to McKinsey, the difference is partly the result of lower cost savings achieved by French and German companies (which tend to relocate their activities to eastern Europe) relative to US companies (which relocate to India). The biggest difference with the US, however, results from the relatively low re-employability of French and German workers who lose their jobs. The study blames inflexible labour markets for this lower re-employability.

All in all, the existing evidence suggests that the arguments in favour of free trade are valid for services as well as for traded goods. Thus, in terms of welfare, one might expect long-run benefits from outsourcing services, although short-run adjustment costs do exist. More flexible and innovative economies are, of course, in a better position to reallocate resources and to reap long-run benefits faster than more rigid economies.

3 MARKET STRUCTURE AND THE DEGREE OF COMPETITION IN SELECTED SERVICES SECTORS

The objective of this chapter is to define the proxies of services market competition and to present their main characteristics across countries and industries and over time. The chapter is organised as follows: Section 3.1 discusses the main characteristics of the selected services sectors (non-financial business services), Section 3.2 introduces the definitions of the proxies of competition analysed in this report and Section 3.3 presents the main developments and key facts regarding the three groups of proxies of competition used: proxies

of profitability, proxies measuring the degree of regulation and openness and proxies of market structure.

3.1 DEFINITION AND CHARACTERISTICS OF SELECTED SERVICES SECTORS[25]

In this chapter and in the rest of the report, the focus is on selected services industries, namely non-financial business services. In particular, financial intermediation and community, social and personal services are excluded from the analysis because of their specific characteristics outlined in Boxes 3 and 4 and in order to keep the report focused. The value added (employment) of the selected services industries covered in the rest of the report accounts for approximately 61% (53%) of the valued added (employment) of the total services sector in the euro area in the period 1996-2003, which in turn represents close to 43% (36%) of total valued added (employment) of the euro area in the same period. The importance of the selected non-financial business services sectors is illustrated by their value added share increase (in terms of total value added) of close to 7 percentage points between the periods 1981-1990 and 1996-2003.

In what follows a brief description of the characteristics of the selected services industries following the European NACE Rev. 1 classification system is given.

SELECTED SERVICES SECTORS

1. The *wholesale and retail trade and repairs* industry (50-52) includes: (i) sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel; (ii) wholesale trade and commission trade, except of motor vehicles and motorcycles; and (iii) retail trade, except of motor vehicles and motorcycles; repair of personal and household goods. Generally, this industry has a competitive structure which varies widely from one country to another.

   General trends include an increase in concentration (Baily and Solow, 2001) since companies seek to exploit economies of scale, the introduction of ICT, vertical integration, internationalisation and the rapid development of new forms of distribution such as electronic commerce. While retail markets are typically regulated, the European process of liberalisation has not yet reached the degree of market liberalisation prevailing in the US. In general, traditional regulations typically aim at protecting small shops from the competition of large commercial centres (McGuckin et al., 2005); therefore, the likely effect of an easing in regulation is expected to be an increase in the average size of retailing outlets due to a reduction in the number of firms and an increase in employment in that sector (see Box 5).

2. *Hotels and restaurants* (55) include hotels, camping sites and other forms of short-term accommodation, restaurants, bars and canteens. There has been very little change in the value added shares in this industry characterised by zero or negative productivity growth (except for some countries which are specialised in these services). Wölfl (2005) argues that the main key characteristics of this industry are a low capital-to-labour ratio, small size, domestic orientation and production mainly for final consumption.

3. The industry *transport and storage* (60-63) consists of land transport (including road, rail and pipeline transport), water transport, air transport and supporting transport activities. The importance of individual means of transport varies across the euro area countries, with land transport being of particular importance. Regarding railway transport, the euro area countries are still in an early stage of liberalisation. The airline industry includes the transport of both passengers and freight by air. The European air industry was formally deregulated in 1997 but many routes are still monopolistic or duopolistic (see Gonenc and Nicoletti,

25 Prepared by Elena Yusupová.

2000, and Martin et al., 2005). Despite not being fully competitive, the liberalisation of the airline industry has progressed rapidly and has contributed to an increase in airline transport within Europe.

4. Regarding *post and telecommunications* (64), telecommunications is probably one of the most dynamic sectors, mostly for technological reasons. The range of services provided by this sector is continuously expanding, and employment has generally increased simultaneously with an increase in labour productivity (Faini et al., 2004). This sector thus provides an example of where liberalisation has boosted output without jeopardising job creation and convergence in productivity (van Ark et al., 1999). Consumers benefit from substantial price reductions and investment in new technologies. It is however difficult to disentangle the extent to which these developments are due to liberalisation, restructuring and competition rather than to the considerable technological progress taking place in the industry (which is, however, also linked to the aforementioned factors).

   The market for postal services has been exhibiting rapid growth in the last few years and has further growth potential. Parcel delivery and express services operate in a broadly competitive environment, whereas mail services are still highly regulated. Regulatory frameworks differ from Member State to Member State, as the first Postal Services Directive opened up only about 3% of regulated mail services to competition. The new Postal Directive adopted in 2002 defined further gradual steps in the market-opening process (see Martin et al., 2005).

5. The *real estate, renting and business activities* industry (70-74) consists of the following heterogeneous services: real estate activities (70); renting of machinery and equipment (71); computers and related activities (72), which includes hardware and software consultancy and supply, data processing, database activities and maintenance of computing machinery; research and development (73), which incorporates basic and applied research and experimental work; and finally, other business activities (74), which cover mainly professional services such as legal, accounting, book-keeping and auditing activities, tax consultancy, market research, business and management consultancy, architectural, engineering and other technical activities, and advertising.

   Regulation at national level seems to be the norm for professions across Europe, but the extent and content of regulation vary from country to country (for more details, see Paterson et al., 2003). The common trend across Europe is reliance on general competition law.

As discussed in Chapter 2, the performance of many of the selected services industries covered in the rest of this report, in particular wholesale and retail, renting of machinery, R&D and professional services, has contributed significantly to the difference between US and European post-1995 labour productivity growth (McGuckin et al., 2005, ECB, 2004b and 2005a).

3.2 PROXIES OF SERVICES SECTOR COMPETITION: A TAXONOMY[26]

After discussing in Section 1.1.1 the definition and the different types of competition, this section focuses now on its measurement. In practice, measuring goods and services market competition is a complex task. Given that competition cannot be measured directly, proxies must be used. Table 3 below summarises the proxies of services market competition used in the report. For each proxy, its source, the type of proxy and the availability by year and country are specified in the top heading of the table. The availability by industry of each proxy

26 Prepared by Moreno Roma.

is also presented. A "YES" indicates that the proxy can be constructed for the selected services industries considered. To this end, an effort has been made to establish the closest possible correspondence between the industry coverage of each proxy constructed and the industry classification according to the OECD's STructural ANalysis (STAN) database. In some instances however, the correspondence is not exact.[27] It is worth mentioning from the outset that none of the proxies used is free from possible criticisms and that the use of a wide range of indicators is warranted in order to check the robustness of the results and to tackle possible conceptual or statistical limitations associated with each proxy. Moreover, in some instances there may be further limitations related to the comparability of the proxies of competition across countries.

The proxies of services market competition used can be schematically divided into three categories: proxies measuring corporate profitability, proxies measuring the degree of regulation and openness and proxies capturing the market structure.

Focusing on the *first group of proxies of profitability*, the *mark-up* is used as a proxy of services market competition. The mark-up is intended to proxy the ratio of price over marginal costs in the calculation of the so-called Lerner index (the ratio of price minus marginal costs over price), which measures the intensity of competition within a market. Given that the direct empirical measurement of the Lerner index is quite difficult since firms' marginal costs are not observable, the mark-up is measured as the inverse of the labour income share in the economy, following Gali (1995), Neiss (2001), Cavelaars (2003) and Przybyla and Roma (2005). The mark-up (including income of the self-employed) is equivalent to computing the ratio of the value added deflator over unit labour costs. This methodology has the advantage of requiring data which are broadly available for the services sector, but does not explicitly take into account the evolution of the capital stock, which could have played an important role in some services industries, especially in most recent years.[28] Moreover, the mark-up may not fully reflect the degree of market competition when trade unions are able to appropriate large quasi-rents or when specific country or sector developments not related to the evolution of competition affect unit labour costs.

As a second proxy of profitability, the *profit margin* is calculated as the ratio of the operating surplus to value added (see Annex 1). In computing the profit margin, several methodological issues (for an exhaustive discussion, see ECB, 2004a) and additional measurement challenges must be addressed. Two different measures of profit margins are considered, both excluding the imputed labour income of the self-employed, namely gross operating surplus over value added and net operating surplus (i.e. excluding the consumption of fixed capital) over valued added.[29]

The proxies of profitability discussed above can be considered as proxies of domestic competition. It is however important to stress that even if these proxies are generally used in the literature to "measure" competition (see Annex 3), drawing strong conclusions is generally difficult given that high profitability could either be associated with a lack of competition (in a sheltered/protected sector) or with high dynamic efficiency of firms within a competitive sector leading to productivity gains (with firms exploiting ICT, innovation,

27 For example, the indicator of FDI restrictions for telecommunications has been attributed to the classification "post and telecommunications (sector 64)" in STAN given that a disaggregation between the two industries was not available in STAN.

28 However, severe limitations regarding capital stock data exist for the majority of services industries analysed, which limits the scope for estimating the mark-up in a more comprehensive way, as done, for example, in Martins et al. (1996) and Martins and Scarpetta (1999).

29 Given that the ratio of intermediate inputs (the difference between production and value added) to total output differs across sectors and affects the measurement of the profit margin, the profit margin is computed using value added instead of production in the denominator.

economies of scale, etc.).[30] However, stronger competition should reduce profits in the medium to long run.

Regarding the *second group of proxies measuring the degree of regulation and openness,* finding industry-specific proxies of competition is a challenging task. The following indicators are used (see Table 3):

(i) *Internal Market Restrictiveness Index in Services* (IMRIS) computed by Copenhagen Economics (2005), which is available for selected industries (retail, computer and related activities, and accountancy). The IMRIS measures existing barriers to the internal market for services using an index methodology[31] based on objective questions regarding legislation and other barriers to the provision of services in the EU. Given that a domestic and a foreign IMRIS are computed, the first is used to proxy domestic competition and the latter international competition.

(ii) Indices of *foreign direct investment (FDI) restrictions* developed by Golup (2003) and covering several services industries since the beginning of the 1980s.[32] The index of FDI restrictions, which signals discrimination of a country against foreign firms, is built aggregating several indicators, such as operational restrictions on foreign firms and the existence of limits on foreign equity ownership. FDI restrictions can be used as a proxy of international competition.

(iii) *Trade openness* (measured as exports plus imports of services over valued added) taken from the OECD Statistics on International Trade in Services. Openness can be used as a proxy of international competition and is available for selected services industries across different time spans for different countries.

(iv) *Indicators of sectoral regulations* developed by Nicoletti and Scarpetta (2003) and subsequently updated in OECD (2005e), for non-manufacturing industries including land and air transport and post and telecommunications. These indicators, which cover sectors in which anti-competitive regulation is prevalent, cover various aspects of regulatory reforms over time on the basis of available information on barriers to entry, public ownership, market structure, vertical integration and price controls. Sectoral indicators for the retail sectors are also available and cover barriers to entry, operational restrictions and price control (see OECD, 2005e).

(v) Indicators based on the OECD's *Product Market Regulation* (PMR) database are compiled on the basis of a comprehensive set of answers to a questionnaire sent to OECD member governments. The PMR indicators consist of 16 indicators grouped in three main categories: state control, barriers to entrepreneurship and barriers to trade and investment. These three main indicators are in turn further aggregated to obtain an overall indicator of product market regulation. This indicator is a synthesis of regulations that have the potential to reduce or increase the intensity of competition in areas of the product market domain. Despite the fact that the PMR database is not industry-specific but rather covers the aggregate economy, the overall indicator summarises information on 139 economy-wide or industry-specific regulatory provisions that comprise the most important aspects of general regulatory practice as well as some aspects

30 For a discussion, see Boone (2000), which shows that competition raises the profits of more efficient firms relative to the profits of less efficient firms. In Boone (2004) the author introduces a new measure of competition, relative profit difference, which is monotone in competition. The disadvantage of this approach is that it requires firm-level data.

31 A system of scores and weights converting qualitative information about restrictions into quantitative information.

32 We are grateful to Stephen Golup for making this dataset available.

Table 3 Overview of proxies of services market competition in relation to the OECD STAN database classification

Source of the proxy:		OECD STAN database	Copenhagen Economics (2005)	Golup (2003)	
Type of proxy:		Mark-up and profit margin (gross and net)	Internal Market Restrictiveness Index in Services (foreign and domestic IMRIS)	Indices of FDI restrictions	
Time coverage:		Varies	2004	1981; 1986; 1991; 1998-2000	
Availability by country:		Varies	EU15	EU14 (excl. LU), US	
Availability by industry as listed below:					
Grand total	01-99	Yes	-	Yes	
Total manufacturing	15-37	Yes	-	Yes	
Wholesale and retail trade; rest. and hotels	50-55	Yes	-	-	
Wholesale and retail trade; repairs	50-52	Yes	-	Yes (Distribution)	
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50	Yes	-	-	
Wholesale, trade & commission excl. motor vehicles	51	Yes	Yes (Wholesale sector)	-	
Retail trade excl. motor vehicles; repair of household goods	52	Yes	Yes (Retail sector)	-	
Hotels and restaurants	55	Yes	-	Yes (for 1998-2000 only)	
Transport and storage and communication	60-64	Yes	-	Yes	
Transport and storage	60-63	Yes	-	Yes	
Land transport; transport via pipelines	60	Yes	-	-	
Water transport	61	Yes	-	-	
Air transport	62	Yes	-	-	
Supporting and auxiliary transport activities	63	Yes	-	-	
Post and telecommunications	64	Yes	-	Yes (Telecommunications)	
Real estate, renting and business activities	70-74	Yes	-	-	
Real estate activities	70	Yes	-	-	
Renting of m&eq and other business activities	71-74	Yes	-	-	
Renting of machinery and equipment	71	Yes	-	-	
Computer and related activities	72	Yes	Yes (IT services)	-	
Research and development	73	Yes	-	-	
Other business activities	74	Yes	Yes (Accountancy)	Yes (Business activities)	
Total services	50-99	Yes	-	-	
Non-financial business services	50-74 (excl. 65-67)	Yes	-	-	

	OECD Product Market Regulation database (PMR)	OECD PMR, Nicoletti and Scarpetta (2003) and OECD (2005e)	OECD Statistics on International Trade in Services	European Commission (Eurostat New Cronos)	Sectoral regulation for professional services (Paterson et al. 2003) and OECD (2005e)
	Various: State control, barriers to entrepreneurship, barriers to trade and investment, etc.	Indicators of sectoral regulation	Openness = (exports + imports)/value added	Indicators of market structure (number of firms, number of persons per enterprise and number of self-employed persons per enterprise)	Indicators of sectoral regulation
	1998 and 2003	From 1975 to 2003	Differs across countries (1995-2003)	Differs across countries	1996 and 2003
	EU15, US	EU14 (excl. LU), US	EU15, US	EU15 (excl. GR)	EU15, US
	Yes	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	Yes 1998 and 2003 (Retail)	-	Yes	-
	-	-	-	Yes	-
	-	-	-	Yes	-
	-	-	-	Yes	-
	-	-	-	Yes	-
	-	-	-	-	-
	-	-	Yes (Transportation 205)	-	-
	-	Yes (Railways and road)	-	Yes	-
	-	-	-	Yes	-
	-	Yes	-	Yes	-
	-	-	-	Yes	-
	-	Yes (Telecoms and post)	Yes (Communication services 245)	Yes	-
	-	-	-	-	-
	-	-	-	Yes	-
	-	-	-	-	-
	-	-	-	Yes	-
	-	-	Yes (Computer and related activities 262)	Yes	-
	-	-	Yes (Research and development 279)	Yes	-
	-	Yes 1996 and 2003	Yes (Legal, accounting, etc. 274)	Yes	Yes
	-	-	Yes (Tradable services, category 200)	-	-
	-	-	-	-	-

of industry-specific regulatory policies (in particular, in retail distribution, air and rail passenger transport, rail and road freight and telecommunications). Therefore, some of the PMR indicators can be related to these specific services industries.

(vi) Indicators of *sectoral regulations for professional services* (e.g. accountants, pharmacists, architects, engineers and lawyers) developed by Paterson et al. (2003). For each professional group, these indicators combine a regulation index for market entry and for market conduct into an overall regulation index. OECD indicators based on the methodology developed by Paterson et al. (2003) are also available.

The foreign IMRIS, the indicator of FDI restrictions and the indicators of trade openness are proxies of international competition, whilst the OECD indicators of sectoral regulation and the OECD PMR indicators can be proxies of both domestic and international competition (for example, the administrative burden can negatively affect both domestic and international firms wishing to set up a new business).

The *third group of services sector competition proxies* consists of indicators of the market structure in selected services industries, comprising the number of firms, the number of persons employed per enterprise and the share of the self-employed in total employment. These indicators are taken from Eurostat New Cronos and are analysed in order to investigate developments which could affect domestic competitive conditions across services industries and countries and over time. Due to data unavailability, it was not possible to construct more precise measures of market concentration, such as Herfindahl indices. It is important to stress that firm size should not be taken unambiguously as a proxy for market concentration: while, on the one hand, average firm size may be positively related to concentration, on the other hand a fragmented market structure might be an indication of barriers to entry for more efficient organisational modes, such as large outlets in retail trade (see Box 5).

3.3 PROXIES OF SERVICES MARKET COMPETITION: MAIN DEVELOPMENTS AND KEY FACTS[33]

This section describes the main developments and key facts regarding the proxies of profitability and services market competition discussed in Section 3.2. The proxies of market structure are dealt with in the next section. The qualitative description which follows sketches the main developments in each proxy over time for the euro area as a whole and then discusses relevant country developments, especially when they present marked differences compared with the euro area average. Generally, overall services or non-financial business services are first covered, followed by comments on selected sub-industries.

3.3.1 PROXIES MEASURING CORPORATE PROFITABILITY

Mark-up is defined in Section 3.2 and expresses the ratio of prices over unit labour costs. Chart 16 shows the evolution of the level of mark-up across time, namely in the 1980s (1981-1990 average), 1990s (1991-2003 average) and in the 1996-2003 period, for the total economy and non-financial business services. The mark-up, corrected for the imputed labour compensation of the self-employed, is characterised by rather limited variations over time and by an increasing trend in the 1990s compared with the 1980s in the euro area and in most of the euro area countries and sectors examined. Exceptions are the post and telecommunication industry, where the mark-up accelerated substantially since the 1990s, and real estate, renting and business activities, where mark-ups are significantly higher compared with the total economy but are on a downward trend.

33 Prepared by Elena Yusupová and Moreno Roma.

The mark-up for the euro area in the period 1996-2002 ranges from 1.4 in hotels and restaurants to close to 3 in real estate, renting and business activities. Comparisons of mark-ups between sectors and across countries should be made with caution given that these measures are influenced by the business cycle (and not all countries are at the same point of their cycle) and by the market structure. Moreover, industries may differ substantially between countries. With this caveat in mind, differences exist between countries, e.g. Luxembourg significantly exceeds the average value in wholesale and retail trade, Greece and Spain in hotels and restaurants and Finland in transport and storage.

In most of the selected sectors, the mark-up is consistently higher in the US than in the euro area and shows a similar increasing trend over time. An exception is real estate, renting and business activities, where the mark-up in the US is lower than in the euro area over the three time intervals considered. In addition, mark-ups in the euro area non-financial business services sector exceeded the mark-up in the euro area total economy and manufacturing, which might indicate lower competitive pressures in business services relative to the rest of the economy.

As a second proxy of profitability and competition, the profit margin is calculated as the operating surplus divided by value added. Profit margin expresses the proportion of value added appropriated by services firms, the economic intuition being that in competitive industries firms should not be able to retain a large proportion of generated value added. Profit margin can be gross or net, depending on whether consumption of fixed capital has been subtracted from the operating surplus or not. Due to data availability, the gross profit margin is used in this discussion, after having checked that using net operating surplus for the countries available would give a broadly similar picture.[34] Chart 17 shows the evolution of the gross profit margin in the three time intervals considered for the total economy and non-financial business services.

The profit margin is rising from the 1980s to the 1990s in the euro area and in most countries and in all selected industries except for real estate, renting and business activities. Though the data are not available for all countries and sectors, some general observations can be made. In the interval 1996-2002, the profit margin in the euro area was lowest in wholesale and retail trade, at 0.23, and highest in real estate, renting and business activities,[35] where it reached 0.6, ranging from 0.49 in Luxembourg and the Netherlands to 0.85 in Greece. Services industries are generally characterised by a large variation of profit margins across countries; for example, in hotels and restaurants the values range from -0.13 in Germany to 0.61 in Greece.

A higher level of profit margins in the euro area non-financial business services sector relative to the total economy (see Chart 17) might again indicate a lower level of competition, but the caveats mentioned in Section 3.2 should be borne in mind and one should be careful in drawing conclusions.

3.3.2 PROXIES MEASURING THE DEGREE OF REGULATION AND OPENNESS

We turn now to the second group of proxies of services market competition:

(i) *Internal Market Restrictiveness Index in Services* (IMRIS): Table 4 reports data for the euro area countries, together with Denmark, Sweden, the UK and the euro area average, for the IMRIS in the retail and wholesale sector, IT-related services

34 The main difference using the net profit margin lies in a more moderate heterogeneity across countries, which indicates that different methods of depreciation and different extents of fixed capital consumption resulted in different effects across individual countries.

35 It should be noted at this point that the composite nature of this sector implies that the profitability measures are influenced by all three sub-sectors included and that there is a positive correlation between these profitability measures and the weight of the real estate and renting sub-sectors, which by their nature have high mark-ups in each country.

and accountancy. The last two indicators can be used to proxy the STAN industries "computer and related activities" (72) and "other business activities" (74). The IMRIS refers to the year 2004 and ranges from 0 (no restriction) to 1 (most restrictive). The following observations can be made: the domestic and foreign IMRIS for accountancy in the euro area is considerably higher than in the other three sectors, indicating that regulated professional services such as accountancy are less exposed to domestic and international competition. On average, the foreign IMRIS is approximately twice as high as the domestic indicator in all sectors, reflecting the existence of some barriers which are relevant for foreign firms only. Moreover, the unweighted standard deviation of the euro area foreign IMRIS in all sectors is higher than the domestic one, reflecting a higher heterogeneity of foreign restrictions across euro area countries. Regarding country-specific results, barriers tend to be either relatively high within a Member State (Belgium, Greece, France, Spain, Italy and Austria) or low (Germany, Luxembourg, Finland) in all sectors examined, as proved by very high correlation coefficients across sectors (not shown in Table 4).

(ii) *Indices of FDI restrictions* (Golup, 2003): The indices range from 0 (no restriction) to 1 (highest restrictions). Chart 18 shows the indices of FDI restrictions in 1981, 1986, 1991 and in the 1998-2000 period for the total economy, the distribution sector (50-52), hotels and restaurants (55), transport (60-63), telecommunications (64) and other business activities (74). FDI restrictions in the euro area have decreased across countries and industries and over time and the degree of dispersion across countries (measured by the unweighted standard deviation) has also dropped significantly over time. For the total economy and for the transport and communication sector, the extent of FDI restrictions in the euro area in 1998-2000 was lower than in the US. The telecommunication sector has undergone a very marked opening-up to international competition since the beginning of the 1990s, mirrored by a reduction in FDI restrictions over the same period. Regarding country developments, Austria stands out as one of the most restrictive countries in terms of FDI restrictions across the industries examined and over time. In 1998-2000, Finland and Portugal also had relatively high indices of FDI restrictions.[36]

(iii) *Trade openness:* Trade data were available only for transport and storage, post and telecommunications, computers and related activities, research and development, other business activities and total services. The degree of openness (see Chart 19) shows large differences across countries and sectors. Particular caution should be exercised in comparing trade openness in services across countries given that geographical and cultural characteristics of each country which are unrelated to competition could play a role. For total services, Ireland is by far the most open economy[37] (in the interval 1996-2002, the value of the indicator reached 88%), followed by Austria (48%), Belgium and Luxembourg[38] (46%) and the Netherlands

36 In 2004 Portugal revoked the legislation that provided for the possibility of limiting foreign participation in the capital of privatised companies, therefore significantly reducing the extent of FDI restrictions.

37 In the case of Ireland, the relatively large presence of international financial institutions in Dublin partly accounts for high services imports and exports. In addition, the extent of services imports that arise from the manufacturing sector in Ireland is also contributing to higher than average openness. Therefore, openness is most likely not particularly informative as a proxy of competition in the case of Ireland.

38 For the period under review, the dataset used provides information for Belgium and Luxembourg as an aggregate only, and not for the respective economies individually. However, if one calculates trade openness for total services on the basis of ESA 95 national accounts data, it turns out that in the case of Luxembourg, services exports plus imports amounted to 169% of total gross value added on average for the period 1996-2002 (in current prices). This makes Luxembourg the most open economy under review.

(40%). As expected the large economies such as Germany, France and Italy exhibit a much lower level of openness. Countries usually have a similar level of openness across services industries relative to others, i.e. a country is either relatively closed or open in most of its services industries. However, a more precise analysis is complicated by missing data for some sectors. On the other hand, even though the euro area countries have a similar level of openness in other business activities, there is a large variation in transport and storage (ranging from 48% in Italy and Spain to 213% in Greece[39]) and post and telecommunications (ranging from 8-10% in France, Spain and Greece to 51% in Ireland). This might be partially related to the different pace of liberalisation in these sectors. Transport and storage and computers and related activities are the most open, but the strongest growth in openness during the period 1996-2002 is recorded in post and telecommunications, a sector undergoing important structural changes.

(iv) *Indicators of sectoral regulation:* The indicators of sectoral regulation developed by Nicoletti and Scarpetta (2003) and updated by the OECD (2005e) range from a minimum of 0 (no regulation) to a maximum of 6 (highest level of regulation). Chart 20 shows the evolution of the indicators for air transport, land transport and post and telecommunications[40] in the 1981-1990, 1991-2003 and 1996-2003 periods. These indicators have decreased significantly over time in the euro area and across countries, suggesting that the extent of regulation in land and air transport and post and telecommunications has become more "business-friendly" and competition-friendly over time. This is the case for air transport in particular, which recorded the biggest drop. Progress recorded tends however to differ across countries and industries, as suggested by the increase in the dispersion of sectoral regulation over time (signalled by a higher unweighted standard deviation across countries in the last two periods considered compared with the first one). This suggests that the pace of implementation of regulatory reforms is not homogeneous across countries and that cross-country differences in the level of regulation in these industries are still considerable. In the air transport industry, regulation in the 1991-2003 period ranged from 4.8 in Greece to 1.3 in the Netherlands. In post and telecommunications, regulation in the same period varied from 4.4 in Greece to 2.8 in Finland.

The sectoral indicator for retail trade (see first two columns of Table 7) is available for 1998 and 2003 and also ranges from a minimum of 0 to a maximum of 6 (highest level of regulation). This indicator has only moderately fallen for the euro area since 1998 and changes over time are not homogeneous across countries. Belgium, Germany and marginally Greece have tightened regulation in the retail sector since 1998. In general, a group of euro area countries (Belgium, Germany, Greece, Spain, France and Austria) seem to have stricter retail regulation, whilst another group of countries (Ireland and the Netherlands) seems to be more liberal.

(v) *Indicators based on the OECD Product Market Regulation* (PMR) *database:* These indicators range from a minimum of 0 to a maximum of 6 (highest level of regulation). The overall PMR index shows a clear drop in its value between 1998 and 2003, for both the euro area and all countries examined (see Table 5, first column). This suggests that the regulatory environment has become more supportive of product market competition since 1998. The biggest improvements are recorded

39 This is mainly due to sea transport.
40 See Annex 1 for a discussion of the aggregation method used for sectors 60 and 64.

for Greece, Italy and France. It is however important to stress that the levels of the PMR indicator differ considerably across countries and that changes since 1998 have to be assessed against the initial starting position of each country. Notwithstanding the progress recorded, Italy, France and Greece are amongst the countries with the highest degree of product market regulation. Differences in the PMR indicator across euro area countries, as measured by the unweighted coefficient of variation, appear to have declined somewhat in 2003 compared with 1998. Looking at the "max./min." ratio, i.e. the ratio of the highest to the lowest value of the indicator amongst the euro area countries considered, a reduction of the degree of heterogeneity in product market regulation across countries has also taken place since 1998. A closer look at the data shows that amongst the three main components of the PMR indicator (see Table 5), the indicator of state control in the euro area has generally recorded the sharpest drop (especially in Greece, Italy, Finland, Belgium and Portugal), although its level in 2003 was still twice that recorded in the US. Improvements recorded in the indicator of barriers to trade and investment and barriers to entrepreneurship in the euro area appear somewhat more limited than for the overall PMR indicator. Despite the fact that these PMR indicators are country-specific and not sector-specific, some lower-level indicators also cover important aspects of sector-specific regulation. The indicator "sector-specific administrative barriers" within the barriers to entrepreneurship domain "reflects administrative burdens in the road and retail distribution sectors" (OECD, 2005e) and the indicator of "legal barriers" within the same domain "measures the scope of explicit legal limitations on the number of competitors allowed in a wide range of business sectors" (ibid.). The indicator of "ownership barriers" within the barriers to trade and investment domain measures legal restrictions on foreign acquisition of equity in public and private firms and in telecommunication firms and airlines. The evolution of these indicators is presented in Table 6. The evolution of these three lower-level indicators is broadly similar to the dynamics recorded for the higher-level indicators, showing an overall reduction of regulation over time in the euro area matched by a reduction in heterogeneity across countries. More specifically, looking at sector-specific administrative barriers, Austria stands out for an increase of the indicator since 1998, from 2.4 to 3.4, which makes it the most restrictive country in this domain. By contrast, Austria made significant improvements in reducing legal barriers to competition, which are the lowest in the euro area. Ownership barriers in France and Italy in 2003 were significantly higher than in the rest of the euro area.

(vi) *Indicators of sectoral regulations for professional services:* Table 8 shows the values of the indicator in 2003 for each professional service considered. The last column is a simple average of regulation in each profession, as developed by Paterson et al. (2003). A higher value of the indicators indicates stricter regulation. Table 7 reports the overall OECD indicator for professional services in 1996 and 2003 (ranging from 6, highest regulation, to 0, lowest regulation). Over time, regulation of professional services decreased only marginally in the euro area (with the exception of Austria). Both indicators point to the existence of a group of relatively restrictive countries (Italy, Germany, Luxembourg and Greece) and a group of relatively liberal countries (Finland, the Netherlands and Ireland).

Regarding the proxies capturing the degree of regulation and trade openness, it is evident that the regulatory environment in the euro area

countries has become more supportive of services market competition over time, although it remains generally tighter than in the US.

3.3.3 PROXIES CAPTURING MARKET STRUCTURE[41]

This sub-section introduces the proxies capturing market structure that, due to data availability, are mostly related to average firm size. In summary, the evidence indicates that there are substantial variations of firm size across countries even within single industries. Differences are larger in heavily regulated sectors, such as transport and telecommunications. Southern European countries (Italy, Portugal and Spain) tend to be characterised by an average firm size smaller than the euro area aggregate; they also tend to have a larger share of self-employment. These results are an indication of a more traditional productive structure in these countries, characterised by small firms and self-employment.[42]

Table 9 reports the total number of firms in Panel A and the number of firms in the total population (in thousands) in Panel B. In terms of the total number for the euro area, there are around 8.25 million firms in the non-financial business services sector. The sub-sector with the largest number of firms is "retail trade (52)" (2.3 million), followed by "other business activities (74)" (1.8 million), "hotels and restaurants (55)" (1.1 million) and "wholesale trade (51)" (1 million). At the other extreme, "air transport (62)" only comprises 1,628 firms, "water transport (61)" 11,353 firms and "R&D (73)" 21,028 firms. Of course, this is not necessarily related to the actual size of the sectors in terms of employment, as it will be shown shortly that the average number of employees differs greatly across them. The number of firms in relation to the total population in the euro area is large for the wholesale and retail trade sector (50-52), but much lower for transport and storage and communication (60-64).

In terms of countries, Italy is the one with the largest number of firms, followed by Spain, France and Germany. These numbers clearly reflect different average sizes across countries, given that the ranking is different in terms of population. In fact, Panel B shows that the largest number of firms in Italy and Spain reflect a much higher ratio of firms to total population (45 and 42 respectively, against a euro area average of 28). Germany is the country with the lowest value (14.5). While there is clearly an average size factor, at this stage it is not possible to assess if the different firm-to-population ratios also reflect differences in entry barriers.

Table 10 reports data for average firm size (average number of employees per firm) for the selected services sectors. The first column gives the average size for the euro area aggregate. This value should net out national peculiarities and is used as a benchmark. The other columns report the size for each country/sector as a ratio to the aggregate, so that, for example, a value of 1.2 indicates that, in that particular sector, that country has an average firm size 20% larger than the euro area aggregate.

Consider first the euro area aggregate. On average, each non-financial business services sector firm employs 5.3 workers. The average firm size is smallest in the "wholesale and retail trade" (around 4.7 employees per firm), with a very similar size in all sub-sectors; it is slightly larger in "real estate, renting and business activities" (5.14), whose sub-sectors have a more dispersed size structure, ranging from 2.5 in "real estate activities" to 8.7 in "research and development"; it is substantially higher in "transport and storage and communication" (10.4), where the dispersion across sub-sectors is also very pronounced: while "land transport" and "water transport" enterprises employ on average less than 10 workers, average size is 130 in "air transport"; also the "post and telecommunications" sector is characterised by

41 Prepared by Fabiano Schivardi. Due to data availability, Greece is not included in the analysis of this section.

42 It is worth mentioning that firm size may also be determined by country-specific factors, such as urban density, the presence of infrastructure or the efficiency of the judicial system.

a very large average size (70 employees per firm). By taking euro area averages, one downplays the effects of each country's regulation and country-specific characteristics, possibly obtaining values closer to those attributable to the technological characteristics of each sector. These values suggest that economies of scale are more important in some transport activities and in telecommunications; moreover, these are the sectors where regulation and direct public ownership has historically played an important role, traditionally favouring large national monopolies.

Turning to national aspects, Table 10 shows that there are substantial differences in average size across countries. For the whole non-financial business services sector, size is smallest in Italy: the average number of employees in the selected services sectors is 0.58 with respect to the euro area aggregate, followed by Spain (0.77) and Portugal (0.82). Finland, Belgium, France and Luxembourg are characterised by an average size fairly similar to the euro area aggregate, while it is substantially larger in Austria (1.5), Germany (1.7), the Netherlands (1.8) and Ireland (2.0). Moreover, the pattern for the non-financial business services sector tends to be replicated for individual sectors: countries with an overall size larger than the euro area aggregate tend to have larger sizes within each sector. For example, Germany has entries larger than 1 in all sectors but two, while the opposite occurs for Italy. These results indicate that southern European countries have a more pronounced presence of small and medium-sized enterprises across the board.[43] They suggest that specific country characteristics, such as economy-wide regulation, entry barriers or the development of financial markets, tend to favour some modes of production over others in all sectors. This heterogeneity might play an important role in determining cross-country differences in performance, an issue that will be analysed at length in the next chapter.

The last column of Table 10 presents the standard deviations of the entries in the corresponding row. On average, deviations are substantial, almost always above 0.5, implying that country characteristics induce a dispersed size structure across euro area countries. The dispersion is highest in the transport and storage sub-sectors, where regulation and public ownership play a prominent role in shaping market structure. Given that regulation and the degree of public involvement is still very different across countries, this is not a surprising finding. The standard deviation is less marked in business activities, with the noticeable exception of R&D services, where the value is strongly influenced by the outlier for Luxembourg.[44]

The analysis of firm size is closely mirrored by that of the share of self-employment, showing that sectors with a smaller average number of employees per firm also tend to have a larger share of self-employment. A similar pattern emerges from a cross-country analysis: again, southern European countries have a higher share of self-employment.

On the whole, this analysis suggests that southern European countries might be characterised by a more traditional productive structure in the services sector, with a more central role for small firms and self-employment. This characteristic might contribute to slowing down the adoption of more advanced production practices. For example, it is often argued that, in retail trade, large outlets are necessary to fully exploit the organisational and logistical opportunities offered by the adoption of ICT. A productive structure with the prevalence of small enterprises might then imply a low rate of technological adoption, explaining part of the differences in labour productivity growth recorded in the trade sector in recent years between Europe and the US (see Chapter 4 for a discussion).

43 Similar findings emerge from previous work that considers all sectors of the economy (Pagano and Schivardi, 2003).

44 Given the small size of the Luxembourg economy in general and of this specific sector in particular, few firms or even a single large firm can have a major impact on the sector's average firm size.

Box 3

FINANCIAL SERVICES – SPECIAL FEATURES[1]

Despite their importance, financial services are not specifically dealt with in this report. Their exclusion reflects both their specificities (compared with other kinds of services) and their particular importance, both of which are linked to some extent.

Why are financial services special?

The financial sector is characterised by strong externalities affecting the rest of the economy. Its output is largely perceived to be an intermediate input into other sectors of the economy rather than production for final use. In other words, it does not primarily satisfy final consumption – as do other sectors –, but it contributes to the efficient functioning and development of the entire economy.

More specifically, an efficient and highly integrated financial system stimulates saving and capital accumulation, allows for a more efficient allocation of resources through space and time, and simplifies risk-sharing. It can reduce the cost of capital as well as that of financial intermediation and improve competitiveness, thereby lowering prices and stimulating economic growth,[2] job creation and welfare.

Insofar as financial services are important for the economy as a whole and enable other economic transactions to run smoothly, they have some characteristics of a public good – at least the positive externalities are very important.

The importance of the size and structure of the financial sector

Given its associated externalities, the importance of the financial sector is poorly measured by its share in total employment or in value added as appears in the national accounts (see Section 2.1). Its importance is also illustrated by other measures: for example, in 2000 the total sum of claims in the euro area was seven times GDP;[3] and total debt issued by the corporate and financial sectors corresponded to around 75% of GDP, which was comparable to the size of stock market capitalisation.[4]

Some studies suggest that the size of the financial system is positively correlated with the level of economic development. In fact, there have been several attempts to quantify the "growth dividend" resulting when economic agents can access a developed and integrated financial sector (Guiso et al., 2004, Martin, 2004). Results vary, but the estimated effect is often sizeable. In the second half of the 1990s, differences in the efficiency of financial markets may have played a role in explaining the better economic performance of the US relative to the euro area (Lamfalussy, 2003).

1 Prepared by Erik Walch.
2 See Giannetti et al. (2002).
3 See ECB (2002a).
4 Both figures refer to 2001; see Gjersem (2003).

With respect to the relative importance of its segments, the European financial sector differs in a number of aspects from that in the US. For instance, in the field of debt markets, issues by non-financial corporations remain significantly lower in the euro area. There are also marked differences across individual euro area countries. However, if one combines debt issued by firms with that issued by financial institutions, the difference between the euro area and the US is smaller. Stock market capitalisation (as a percentage of GDP) varies greatly across euro area countries, but on average it is much lower in the euro area than in the US. In general, the euro area still has a much more "bank-based" system compared with the rather "market-based" system in the US. However, the role of banks is changing, with investment funds, pension funds and insurance corporations gaining in importance relative to traditional credit activities.[5]

While the size of the financial sector is often found to play a role in economic growth and development,[6] there is some evidence that differences in financial structure do not explain growth differentials between countries. According to Dolar and Meh (2002), there is no systematic difference in the level of growth or in firms' access to finance between market-based and bank-based systems.[7] Instead, what proves more important is the existence of a legal system that protects investor rights and enforces contracts. In this regard, Europe does not need to adopt a financial sector structure closer to that of the US, but policy-makers should concentrate on competition-enhancing measures to improve institutions and infrastructure.

The particular importance of financial services for the ECB's monetary policy

From the point of view of monetary policy, financial services play a special role that distinguishes them from other services. Changes in the banking sector may affect the monetary transmission mechanism. A more integrated financial system is likely to contribute to a more effective, harmonised and smooth transmission of the single monetary policy. However, the stability of the financial system is also a crucial concern for monetary policy and for the economy as a whole. While an integrated financial system should allow for a better risk-sharing and reduce exposure to country-specific shocks, it could also increase the danger of contagion.

Given their specific characteristics and their particular importance, financial services deserve to be treated separately and in more depth than would be feasible in this report.

Recent trends

Two major developments in the financial sector have marked the last decade: the introduction of the euro and the rapid development of information and communication technologies, which have contributed to greater financial integration worldwide. International financial transactions have been simplified by new technologies, contributing to further liberalisation and integration. The integration process was therefore not driven only by policy measures.

Measures of integration are commonly based on a comparison of the returns on assets that generate identical cash flows but are issued in different countries.[8] Financial integration can also be measured with reference to international capital flows or cross-border holdings of debt

5 See Hartmann et al. (2003).
6 In terms of size, the euro area's financial system is comparable to that of the US. See Hartmann et al. (2003).
7 Found in Gjersem (2003). These results are supported by Demirgüç-Kunt and Levine (2001) who find that the level of financial development matters, while the financial structure is of much less importance.
8 See Pagano (2002).

and equity; increasing integration should be accompanied by an increase in cross-border activity.

There is a consensus that financial integration has made significant progress within the euro area; however, the speed of integration differs across market segments. A detailed analysis can be found in ECB (2005b). For the money market, the main findings are that this market has been highly integrated[9] since 1999, but the extent of progress found depends on whether collateralised or unsecured credit is considered.[10] The repo market segment is highly integrated, but less so than the unsecured money market.

As country risks may differ, comparing the yields of *government bonds* can be a somewhat misleading measure of the degree of integration. But with the introduction of the euro, changes in the government bond yields became highly correlated (beta-convergence), suggesting a high degree of integration. For *corporate bonds,* country effects explain very little of the differences in yields between firms, and these appear to stem from (other) firm-specific factors such as credit rating, liquidity and cash-flow structure. With respect to *stock markets,* country diversification still appears to result in a larger reduction of risk than sector diversification. But the difference has shrunk and the sensitivity of stock prices to common shocks has significantly increased, although the remaining role of local factors suggests there is room for further integration.

It is on *credit markets* where the highest segmentation remains, partly due to the intrinsic features of these markets. In some segments, price levels and price differentials between countries are relatively high. This is for instance the case for household consumer loan rates[11] (both levels and changes over time differ across countries). The speed of interest rate adjustment remains relatively low. For mortgage loan rates, differences are decreasing, but still these rates do not follow a co-movement across euro area countries. With respect to loans to firms, the market appears to be more integrated at longer maturities. Mergers and acquisitions in the euro area's banking sector tend to be domestic rather than cross-border, and the dispersion of banks' margins across the euro area has been found to have declined only little since the introduction of the euro.

Slow convergence of interest rates (and margins) in the credit market may have several sources. Credit activity is intrinsically linked with asymmetric information and imperfect substitutability between different sources of financing, in which the characteristics of the borrower and the lender play a crucial role. Private households as well as smaller firms may face higher information costs. Local banks remain the preferred partners of retail customers and arbitrage activity remains rather low. Consequently, competition among banks in the credit market for households and SMEs is generally limited within national borders. The importance of proximity and limited competition might to some extent contribute to higher rates for loans and lower rates for deposits. Furthermore, national tax and legal regimes differ as well as preferences, producing additional barriers to entry.[12] Product differentiation is also found to play a role.

9 For a more detailed assessment, see for instance ECB (2005b).
10 See Gjersem (2003).
11 Attempts to quantify these differences are however complicated by the fact that figures for retail interest rates at the national level can be characterised by a non-negligible degree of uncertainty, which to some extent limits the international comparability of these interest rate statistics.
12 See Gjersem (2003).

All in all, there seems to be substantial room for improvement in the retail sector, with significant potential for increased competition, higher efficiency and lower prices. Nevertheless, compared with other (services) sectors, the financial sector as a whole is among those that show the highest degree of integration. This may be because while the legal background for an integration of markets for a wide range of services is still in the making (see Box 1 on "The European Commission proposal for a Directive on Services in the Internal Market"), the legal framework for the integration of financial services has been in effect for many years[13] now.

13 Full liberalisation of capital movements in the EU was agreed in 1988, but when Council Directive 88/361/EEC came into effect in 1990, some Member States were granted transitional periods. The Maastricht Treaty, which came into force in November 1993, provided that all restrictions on capital movements and payments are in principle prohibited. Council Directive 933/22/EEC of 10 May 1993, which came into effect on 1 January 1996, liberalises access to stock-exchange membership and financial markets in host Member States for investment firms authorised to provide the services concerned in the home Member State. This was a major step towards the creation of a single market for financial (intermediation) services (for an overview see European Commission: http://europa.eu.int/comm/internal_market/capital/overview_en.htm and http://europa.eu.int/scadplus/leg/en/lvb/124036c.htm; for a more detailed presentation, see Rouabah, 2000).

Box 4

NON-MARKET SERVICES – SPECIAL FEATURES[1]

The focus of this report is on competition, productivity and price developments in market services. Non-market services have been excluded from the analysis in Chapters 3 and 4 because of their distinctive features and the resulting (still unresolved) methodological issues in measuring productivity in these sectors (see also Annex 2). This box outlines the special features of non-market services.

Definition of non-market output

According to the European System of Accounts 1995 (ESA 95), non-market output is defined as "output that is provided free, or at prices that are not economically significant, to other units".[2] Prices are deemed to be economically significant if sales revenues cover more than half of the production cost. In terms of the NACE Rev. 1 classification, non-market output is approximated in this report by the output of sectors 75-99: public administration and defence (including compulsory social security); education; health and social work; other community, social and personal services and private households with employed persons.

Importance of non-market services for the economy

Using this approximation, non-market services sectors accounted for around 22% (see Section 2.1.1) of total value added in the euro area in 2002. Furthermore, they provide inputs to the rest of the economy, while the existence of private and social returns on education and health is widely acknowledged.

Measurement issues

Measuring the volume and value of the output of these sectors is complicated for at least two reasons. First, there is a difficulty in identifying the output of certain non-market services, the

1 Prepared by Daphne Nicolitsas.
2 Eurostat (1996). ESA 95, paragraphs 3.14-3.26.

so-called collective services, such as defence and security services, that are not transferable to individual households. Second, even for non-market services that are transferable to individual households (e.g. education and health), prices are not widely available due to a dearth of market transactions.

Currently, the methodology adopted by most national statistical institutes (NSIs) uses the costs of production to determine the value of output (input-based approach). In other words, the value of non-market services is calculated as the sum of the costs of inputs (compensation of employees, intermediate consumption, consumption of fixed capital). The volume of output, on the other hand, is calculated by deflating the inputs used. Labour costs, which make up the bulk of total costs, are usually deflated using some form of average wage index. Deriving the volume change of government output by deflating all the inputs inevitably assumes that the total factor productivity change in the production of government services is equal to zero, and the same then more or less applies to labour productivity change. Therefore, some NSIs impute productivity growth estimates based on general plausibility considerations.

This approach has serious implications for the evaluation of the changes in the efficiency of the provision of non-market services. For example, the substitution of labour by machinery to produce the same output will be recorded as a fall in output if labour productivity is assumed constant.[3] As a result, one could reach the wrong conclusions regarding productivity developments.[4]

The way forward

From the above, it appears that both the definition and the measurement of non-market services are problematic. Firstly, non-market sectors 75-99, according to NACE Rev. 1, are not provided exclusively by the public sector (e.g. private education, private healthcare) since some transactions in these take place in the market. However, a cross-classification between the NACE Rev. 1 industry classification and a market and non-market breakdown is not commonly implemented in national accounts statistics. Given the changes in institutional arrangements that are taking place worldwide (e.g. privatisations) and the increased availability of alternative financing schemes (e.g. public-private finance initiatives), this classification inevitably has certain shortcomings.

Furthermore, given the pressure for continuous welfare improvements, it is obvious that the public sector must know the efficiency of its outcomes in order to improve them further. To this end, direct output measures of the so-called non-market services are needed.

A number of countries have already proceeded in this direction. More specifically, Germany, France, Italy, the Netherlands and the UK from the EU, and a number of OECD countries, e.g. Australia, Canada, New Zealand and Norway, have output-based measures for valuing non-market services. In fact, for EU countries legislation requires Member States to measure the volume change of government output directly, at least for health and education services by 2006. The specific EU requirements, set out in the Eurostat (2001) Handbook on Price and Volume Measures in National Accounts, and in a European Commission Decision of

3 Atkinson Review (2005), p.12.
4 Some countries, notably Germany, apply a constant annual productivity growth rate (of 0.5%) in public administration services. This, however, is deemed to be no less arbitrary than a zero rate of growth.

17 December 2002, call upon Member States to develop direct output measures meeting certain criteria (e.g. quality adjustment based, inter alia, on output indicators; comprehensive coverage of services) in valuing individual services. While acknowledging data limitations, the new approach permits deviations only in special circumstances. Thus, an input-based approach will only be acceptable for collective services. Even in this case, however, each activity will have to be valued separately and all inputs used as well as changes in their quality[5] must be taken into account. Moreover, it should be recognised that the requirements are sometimes relatively vague, leaving Member States with quite some flexibility to implement them, which may maintain some comparability issues within the EU, and internationally, particularly with the US where the Bureau of Economic Analysis (BEA) continues to use input-based methods.

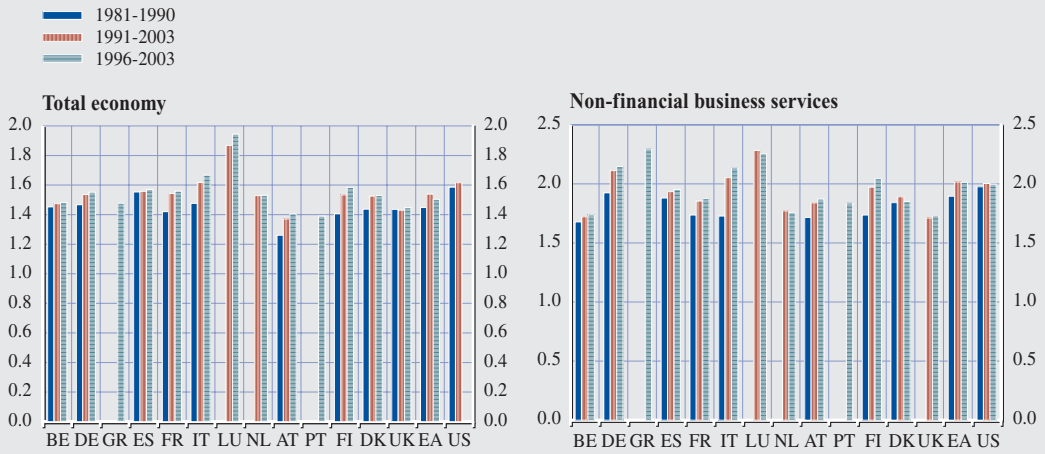
The adoption of the new methodology could alter productivity growth measurement in either direction. Results from comparing input- and output-based measures in the Netherlands and the UK show that the use of output-based measures for the valuation of non-market services would have led to lower estimates of real GDP growth. Australia, Canada and New Zealand, on the other hand, find the opposite result, while estimates from Italy show no difference in the outcome regardless of the methodology followed.[6]

It is clear that the adoption of direct output measures is not straightforward and could, at least initially, give rise to issues of comparability over time and across countries, as well as issues of timeliness. Eurostat is conscious of these outstanding issues and has taken a number of initiatives to coordinate and harmonise the implementation of new (direct) measures of output volume growth. The UK's experience as the only country to have undertaken a very comprehensive review, the so-called Atkinson Review, of the issues involved and to have proposed a list of principles to be followed, is being used as an input in this process. The Atkinson Review stresses that in any case single measures of productivity should not be used and "…independent corroborative evidence should be sought on government productivity, as a part of the process of 'triangulation', recognising the limitations in reducing productivity to a single number".[7]

In anticipation of better indicators and given that most existing studies of productivity focus on the so-called business sector, it seems appropriate to exclude non-market services from the present analysis. The issue of the productivity of non-market services is, however, one that will need to be investigated in the future since these services are important inputs, directly and indirectly, to the business sector and they inevitably have an impact on the latter's productivity.

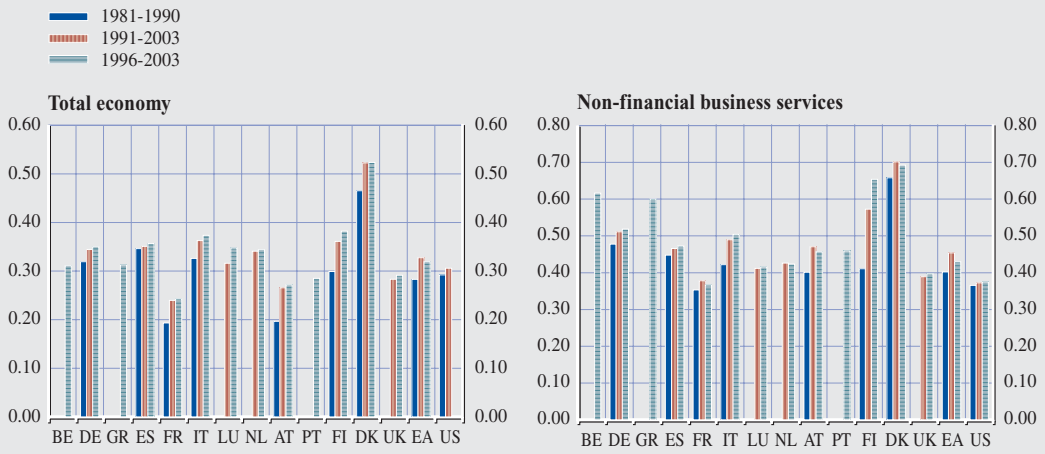
5 For an illustration of the methodology followed to take into account quality improvements in health services output in the UK, see Pritchard (2004).
6 Atkinson Review (2005), pp. 16-33.
7 Atkinson Review (2005), p. 52.

Chart 16 Mark-up



Sources: OECD STAN database, GGDC database, NCBs and own calculations.
Note: The euro area aggregate refers to the 1996-2002 period and is an average of the available country data (data for Ireland are not available).

Chart 17 Gross profit margins



Sources: OECD STAN database, GGDC database, NCBs and own calculations.
Note: The euro area aggregate refers to the 1996-2002 period and is an average of the available country data (data for Ireland are not available).

Table 4 Overall Internal Market Restrictiveness Index in Services (IMRIS)

	Retail			Wholesale			IT-services			Accountancy		
	Foreign (F)	Domestic (D)	F-D	Foreign (F)	Domestic (D)	F-D	Foreign (F)	Domestic (D)	F-D	Foreign (F)	Domestic (D)	F-D
Belgium	0.36	0.18	0.18	0.33	0.15	0.18	0.31	0.11	0.20	0.46	0.26	0.20
Germany	0.24	0.11	0.13	0.21	0.08	0.13	0.21	0.08	0.13	0.5	0.23	0.27
Greece	0.33	0.18	0.15	0.30	0.15	0.15	0.27	0.12	0.15	0.6	0.3	0.30
Spain	0.31	0.21	0.10	0.29	0.19	0.1	0.21	0.10	0.11	0.55	0.28	0.27
France	0.31	0.2	0.11	0.30	0.19	0.11	0.22	0.09	0.13	0.47	0.26	0.21
Ireland	0.25	0.12	0.13	0.24	0.11	0.13	0.22	0.09	0.13	0.16	0.06	0.10
Italy	0.35	0.18	0.17	0.33	0.16	0.17	0.24	0.07	0.17	0.63	0.25	0.38
Luxembourg	0.19	0.08	0.11	0.19	0.08	0.11	0.19	0.08	0.11	0.53	0.27	0.26
Netherlands	0.26	0.14	0.12	0.21	0.09	0.12	0.19	0.07	0.12	0.35	0.17	0.18
Austria	0.33	0.18	0.15	0.29	0.15	0.14	0.25	0.10	0.15	0.68	0.32	0.36
Portugal	0.24	0.14	0.10	0.26	0.17	0.09	0.20	0.10	0.10	0.48	0.3	0.18
Finland	0.28	0.19	0.09	0.23	0.14	0.09	0.20	0.10	0.10	0.46	0.23	0.23
Denmark	0.27	0.11	0.16	0.26	0.10	0.16	0.22	0.06	0.16	0.45	0.21	0.24
Sweden	0.33	0.17	0.16	0.26	0.10	0.16	0.25	0.08	0.17	0.48	0.21	0.27
United Kingdom	0.28	0.15	0.13	0.23	0.10	0.13	0.19	0.06	0.13	0.36	0.19	0.17
Euro area (EA)	0.29	0.16	0.13	0.27	0.14	0.13	0.23	0.09	0.13	0.49	0.24	0.25
Standard deviation EA	0.05	0.04	0.03	0.05	0.04	0.03	0.04	0.02	0.03	0.14	0.07	0.08

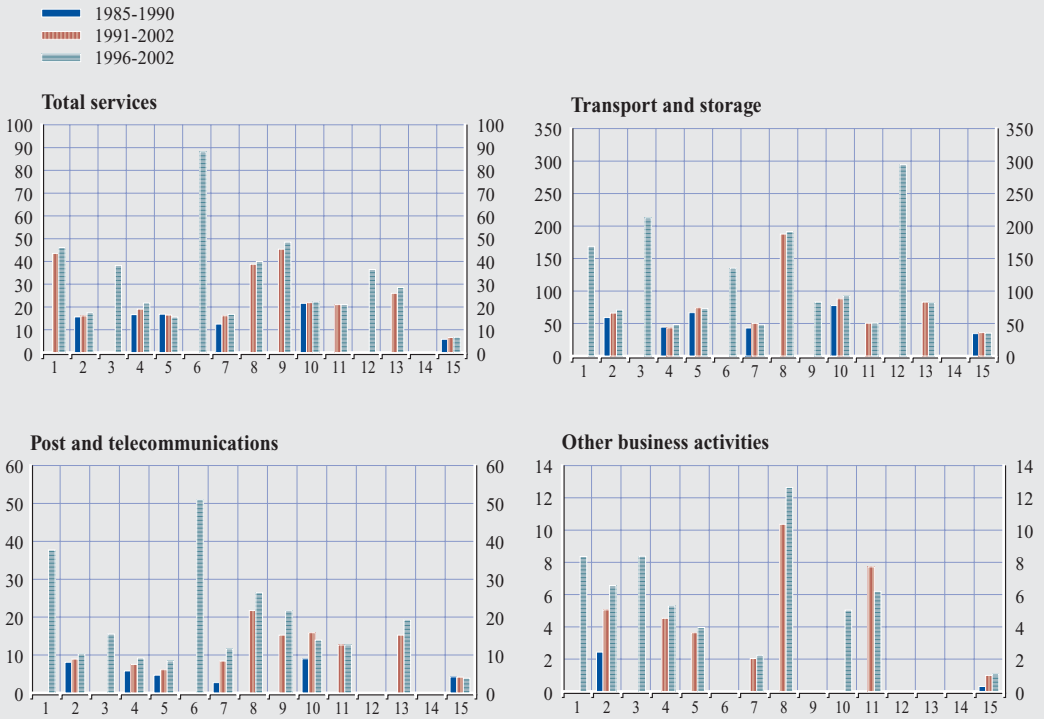
Source: Copenhagen Economics (2005).
Note: A higher index indicates stricter regulation.

Chart 18 FDI restrictions

Sources: Golup (2003) and own calculations.
Notes: The euro area figures are simple averages (excluding Luxembourg, for which data are not available). A higher index indicates stricter regulation.

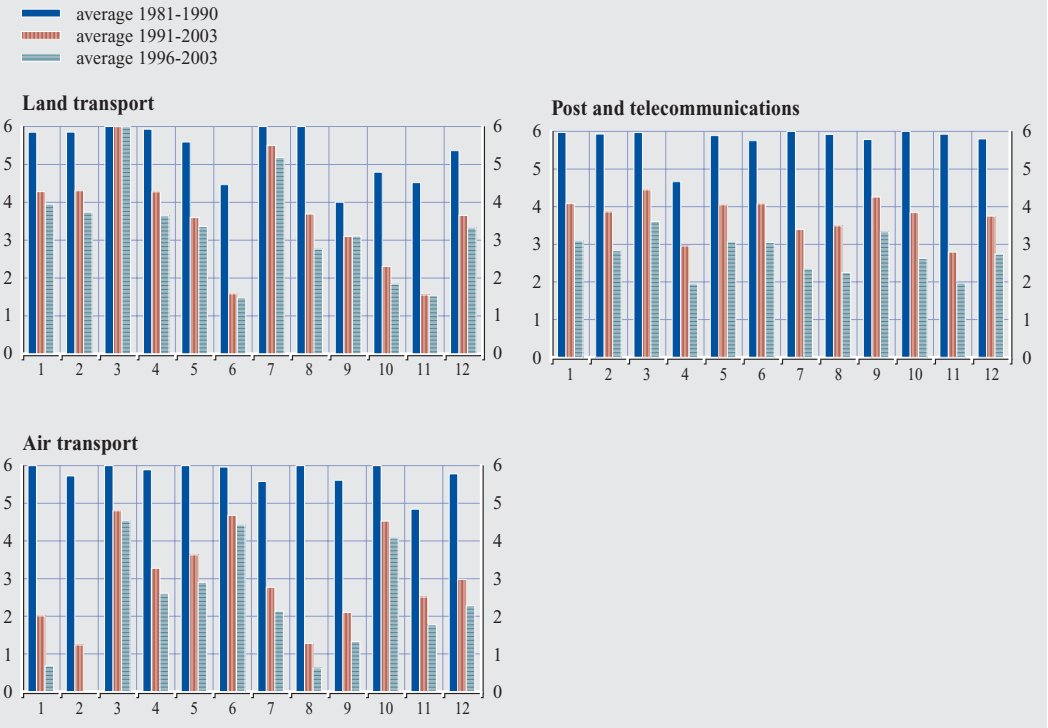
Chart 19 Trade openness

(percentages; exports plus imports of services over valued added)



Sources: OECD Statistics on International Trade in Services and own calculations.
Note: A higher index indicates stricter regulation.

Chart 20 Sectoral regulation



1 = Belgium
2 = Germany
3 = Greece
4 = Spain
5 = France
6 = Ireland
7 = Italy
8 = Netherlands
9 = Austria
10 = Portugal
11 = Finland
12 = Euro area

Sources: Nicoletti and Scarpetta (2003), OECD (2005e) and own calculations.
Note: A higher index indicates stricter regulation.

Table 5 Changes in product market regulation

	Product market regulation		State control		Barriers to entrepreneurship		Barriers to trade and investment	
	2003	Change from 1998 to 2003	2003	Change from 1998 to 2003	2003	Change from 1998 to 2003	2003	Change from 1998 to 2003
Belgium	1.4	-0.7	2.4	-0.9	1.6	-0.3	0.3	-0.8
Germany	1.4	-0.5	2.2	-0.7	1.6	-0.5	0.6	-0.3
Greece	1.8	-1.0	2.8	-1.7	1.6	-0.5	1.2	-0.7
Spain	1.6	-0.7	2.7	-0.5	1.6	-0.7	0.7	-0.9
France	1.7	-0.8	2.7	-0.6	1.6	-1.2	1.0	-0.5
Ireland	1.1	-0.4	2.0	-0.6	0.9	-0.2	0.5	-0.3
Italy	1.9	-0.9	3.2	-1.2	1.4	-1.2	1.1	-0.3
Luxembourg	1.3	-	2.0	-	1.2		0.7	-
Netherlands	1.4	-0.4	1.9	-0.8	1.6	-0.2	0.7	-0.2
Austria	1.4	-0.4	1.9	-0.6	1.6	0.0	0.7	-0.6
Portugal	1.6	-0.6	2.7	-0.9	1.3	-0.5	0.8	-0.3
Finland	1.3	-0.7	2.3	-0.9	1.1	-1.0	0.6	-0.4
Euro area	1.5	-0.7	2.4	-0.9	1.4	-0.6	0.7	-0.5
Denmark	1.1	-0.3	1.3	-0.8	1.2	-0.2	0.8	-0.1
Sweden	1.2	-0.6	1.9	-0.3	1.1	-0.8	0.8	-0.6
United Kingdom	0.9	-0.2	1.7	-0.1	0.8	-0.4	0.4	-0.2
United States	1.0	-0.3	1.2	-0.2	1.2	-0.3	0.7	-0.4
Standard deviation EA	0.2	-0.2	0.4	-0.2	0.2	-0.2	0.2	-0.1
Max-min EA	0.8	-0.6	1.2	-0.7	0.7	-0.9	0.9	-0.2

Source: OECD.
Note: A higher index indicates stricter regulation.

Table 6 Changes in product market regulation

	Sector-specific administrative barriers		Legal barriers		Ownership barriers	
	2003	Change from 1998 to 2003	2003	Change from 1998 to 2003	2003	Change from 1998 to 2003
Belgium	1.7	0.4	1.6	0.3	0.3	-1.5
Germany	1.4	-0.7	1.4	0.3	0.3	0.0
Greece	2.9	-0.3	1.6	0.0	1.3	-1.8
Spain	2.4	-1.0	1.1	-0.3	0.8	-1.1
France	1.6	-1.9	2.2	0.2	2.3	-1.2
Ireland	0.3	-0.2	0.9	0.3	1.2	-0.2
Italy	2.1	-2.6	1.9	-1.4	2.8	-0.3
Luxembourg	0.3	0.1	0.3		1.5	
Netherlands	1.3	-0.3	1.9	-0.3	1.2	-0.1
Austria	3.4	1.0	0.3	-3.3	1.5	-1.3
Portugal	1.8	0.0	1.4	0.2	1.6	-0.1
Finland	1.1	-0.8	1.4	-0.3	1.5	0.0
Euro area	1.7	-0.5	1.3	-0.5	1.4	-0.6
Denmark	0.3	0.1	1.4	-0.9	1.2	-0.2
Sweden	0.9	0.2	2.0	0.0	1.5	0.0
United Kingdom	0.6	-0.2	1.4	0.0	0.3	0.0
United States	1.0	0.2	1.4	0.3	1.8	-1.1
Standard deviation EA	0.9	-0.4	0.6	-0.3	0.7	-0.2
Max-min EA	3.1	-1.4	1.9	-1.1	2.5	-0.6

Source: OECD.
Note: A higher index indicates stricter regulation.

Table 7 Changes in product market regulation

	Retail		Professional services	
	2003	Change from 1998 to 2003	2003	Change from 1996 to 2003
Belgium	4.5	0.9	2.1	-0.1
Germany	3.1	0.8	3.1	-1.0
Greece	4.2	0.2	2.9	-
Spain	3.4	-0.3	2.4	-1.0
France	3.1	-1.6	2.0	0.1
Ireland	1.1	-0.2	1.3	0.1
Italy	2.4	-0.5	3.6	0.3
Luxembourg	-	-	3.2	0.0
Netherlands	1.6	-0.3	1.6	0.2
Austria	3.2	-0.9	2.0	-2.2
Portugal	2.2	-1.0	2.4	-0.3
Finland	2.6	-0.8	1.0	0.2
Euro area	2.8	-0.3	2.3	-0.3
Denmark	2.5	-0.2	0.8	-0.3
Sweden	0.5	-0.8	0.9	0.1
United Kingdom	2.0	-1.4	1.1	-0.3
United States	2.6	-	1.8	-
Standard deviation EA	1.0	0.0	0.8	-0.4
Max-min EA	3.4	0.0	2.6	-0.7

Source: OECD.
Note: A higher index indicates stricter regulation.

Table 8 Regulation indices for professional services

	Accountants	Legal	Architects	Engineers	Pharmacists	Simple average
Belgium	6.3	4.6	3.9	1.2	5.4	4.3
Germany	6.1	6.5	4.5	7.4	5.7	6.0
Greece	5.1	9.5	-	-	8.9	7.8
Spain	3.4	6.5	4.0	3.2	7.5	4.9
France	5.8	6.6	3.1	0.0	7.3	4.6
Ireland	3.0	4.5	0.0	0.0	2.7	2.0
Italy	5.1	6.4	6.2	6.4	8.4	6.5
Luxembourg	5.0	6.6	5.3	5.3	7.9	6.0
Netherlands	4.5	3.9	0.0	1.5	3.0	2.6
Austria	6.2	7.3	5.1	5.0	7.3	6.2
Portugal	-	5.7	2.8	-	8.0	5.5
Finland	3.5	0.3	1.4	1.3	7.0	2.7
Euroa area [1]	4.9	5.7	3.3	3.1	6.6	4.9
Denmark	2.8	3.0	0.0	0.0	5.9	2.3
Sweden	3.3	2.4	0.0	0.0	12.0	3.5
United Kingdom	3.0	4.0	0.0	0.0	4.1	2.2

Source: Paterson et al. (2003).
Note: A higher index indicates stricter regulation.
1) Simple average.

Table 9 Number of firms in 2001

	50-52	50	51	52	55	60-64	60	61	62
Panel A: Absolute numbers									
Belgium	139,567	19,499	44,199	75,869	40,217	16,011	10,154	311	121
Germany	420,530	59,077	94,842	266,611	172,999	91,641	62,519	2,335	345
Spain	784,769	72,283	188,882	523,604	261,670	220,800	194,282	199	44
France	625,876	80,425	165,071	380,380	207,326	94,199	77,366	1,942	539
Ireland[1)]	26,906	4,952	4,676	17,278	13,663	5,321	3,826	45	34
Italy	1,315,073	156,767	419,512	738,794	255,739	163,094	132,896	1,419	193
Luxembourg	7,156	899	3,304	2,953	2,570	1,415	673	377	14
Netherlands	163,680	23,095	54,970	85,615	38,385	28,145	14,165	4,255	165
Austria	64,185	7,922	19,669	36,594	38,680	12,688	9,658	68	79
Portugal	216,760	27,851	48,119	140,790	62,082	18,045	15,195	94	27
Finland	48,110	9,041	15,869	23,200	10,514	23,626	20,662	308	67
Euro area[2)]	3,812,612	461,811	1,059,113	2,291,688	1,103,845	674,985	541,396	11,353	1,628
Panel B: Ratio to population (in thousands)									
Belgium	13.60	1.90	4.31	7.39	3.92	1.56	0.99	0.03	0.01
Germany	5.11	0.72	1.15	3.24	2.10	1.11	0.76	0.03	0.00
Spain	19.39	1.79	4.67	12.94	6.46	5.45	4.80	0.00	0.00
France	10.60	1.36	2.80	6.44	3.51	1.60	1.31	0.03	0.01
Ireland[1)]	7.02	1.29	1.22	4.51	3.56	1.39	1.00	0.01	0.01
Italy	23.08	2.75	7.36	12.97	4.49	2.86	2.33	0.02	0.00
Luxembourg	16.30	2.05	7.53	6.73	5.85	3.22	1.53	0.86	0.03
Netherlands	10.24	1.44	3.44	5.36	2.40	1.76	0.89	0.27	0.01
Austria	8.00	0.99	2.45	4.56	4.82	1.58	1.20	0.01	0.01
Portugal	21.13	2.72	4.69	13.73	6.05	1.76	1.48	0.01	0.00
Finland	9.29	1.74	3.06	4.48	2.03	4.56	3.99	0.06	0.01
Euro area[2)]	13.02	1.58	3.62	7.83	3.77	2.31	1.85	0.04	0.01

	63	64	70-74	70	71	72	73	74	50-74 excl. 65-67
Panel A: Absolute numbers									
Belgium	3,395	2,029	90,748	12,807	3,304	8,646	339	65,653	286,543
Germany	20,670	5,772	505,550	155,427	13,622	36,821	3,626	296,054	1,190,720
Spain	18,559	7,716	433,889	85,795	19,490	19,058	2,694	306,852	1,701,128
France	11,150	3,202	467,984	78,851	23,571	39,920	2,540	323,102	1,395,385
Ireland[1)]	813	706	20,222	3,533	1,310	3,184	152	12,043	66,215
Italy	25,803	2,783	863,333	143,092	13,168	83,359	9,614	614,100	2,597,239
Luxembourg	238	113	6,733	1,073	272	888	21	4,479	17,874
Netherlands	6,200	3,360	132,655	18,920	4,315	16,770	1,525	91,125	362,865
Austria	2,367	515	47,357	5,079	1,554	7,985	220	32,518	162,908
Portugal	2,468	261	55,289	12,472	2,253	2,309	27	38,228	352,176
Finland	2,026	563	43,330	9,819	1,133	3,951	270	28,157	125,580
Euro area[2)]	93,689	27,020	2,667,090	526,868	83,992	222,891	21,028	1,812,311	8,258,633
Panel B: Ratio to population (in thousands)									
Belgium	0.33	0.20	8.84	1.25	0.32	0.84	0.03	6.40	27.92
Germany	0.25	0.07	6.15	1.89	0.17	0.45	0.04	3.60	14.48
Spain	0.46	0.19	10.72	2.12	0.48	0.47	0.07	7.58	42.03
France	0.19	0.05	7.93	1.34	0.40	0.68	0.04	5.47	23.63
Ireland[1)]	0.21	0.18	5.28	0.92	0.34	0.83	0.04	3.14	17.28
Italy	0.45	0.05	15.15	2.51	0.23	1.46	0.17	10.78	45.59
Luxembourg	0.54	0.26	15.34	2.44	0.62	2.02	0.05	10.20	40.72
Netherlands	0.39	0.21	8.30	1.18	0.27	1.05	0.10	5.70	22.70
Austria	0.30	0.06	5.90	0.63	0.19	1.00	0.03	4.05	20.31
Portugal	0.24	0.03	5.39	1.22	0.22	0.23	0.00	3.73	34.34
Finland	0.39	0.11	8.36	1.90	0.22	0.76	0.05	5.43	24.24
Euro area[2)]	0.32	0.09	9.11	1.80	0.29	0.76	0.07	6.19	28.21

Sources: Eurostat New Cronos and own calculations.
1) Firm data for sectors 61, 62 and 63 refer to 1997.
2) No data were available for Greece.
Notes: 50-52 = Wholesale and retail trade; 50 = Sale, maintenance and repair of motor vehicles; 51 = Wholesale trade; 52 = Retail trade; 55 = Hotels and restaurants; 60-64 = Transport, storage and communication; 60 = Land transport; 61 = Water transport; 62 = Air transport; 63 = Supporting and auxiliary transport activities; 64 = Post and telecommunications; 70-74 = Real estate, renting and business activities; 70 = Real estate activities; 71 = Renting of machinery and equipment; 72 = Computer and related activities; 73 = Research and development; 74 = Other business activities; 50-74 excl. 65-67 = Non-financial business services.

Table 10 Average firm size in 2001

	Sectors	Euro area	BE	DE	ES	FR[1]	IE[2]	IT	LU	NL[3]	AT	PT	FI	Standard deviation
Wholesale and retail trade; repairs	50-52	4.70	0.92	2.21	0.78	1.25	1.81	0.52	1.11	1.78	1.88	0.76	1.02	0.56
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50	5.00	0.80	2.00	1.00	1.00	1.20	0.58	1.40	1.36	2.00	0.80	0.80	0.48
Wholesale trade & commission excl. motor vehicles	51	5.19	0.96	2.47	0.96	1.16	2.50	0.48	0.77	1.71	1.93	0.96	0.96	0.69
Retail trade excl. motor vehicles; repair of household goods	52	4.42	0.90	2.17	0.68	1.36	1.81	0.52	1.36	1.92	1.81	0.68	1.13	0.57
Hotels and restaurants	55	4.62	0.84	1.36	0.86	0.86	1.99	0.86	1.08	1.84	1.08	0.86	1.08	0.41
Transport and storage and communication	60-64	10.43	1.65	1.83	0.44	1.59	3.67	0.71	1.53	1.56	1.87	0.94	0.60	0.89
Land transport; transport via pipelines	60	5.86	2.30	1.84	0.51	1.54	1.23	0.68	2.90	2.54	2.56	1.02	0.51	0.88
Water transport	61	8.63	0.47	1.30	4.17	0.93	0.93	1.85	0.46	0.35	0.58	2.32	3.13	1.25
Air transport	62	129.95	0.35	0.91	6.59	1.01	0.28	0.95	1.65		0.85	3.23	1.01	1.91
Supporting and auxiliary transport activities	63	17.82	0.79	1.27	0.56	1.52	10.27	0.73	0.62	0.79	0.84	0.79	0.67	2.85
Post and telecommunications	64	69.95	0.58	1.33	0.36	2.12	0.52	1.47	0.50	0.63	1.60	2.12	1.14	0.65
Real estate, renting and business activities	70-74	5.14	1.00	1.43	0.88	1.11	1.38	0.57	1.28	2.00	1.27	1.16	0.78	0.38
Real estate activities	70	2.53	0.95	0.91	0.79	1.58	1.23	0.79	0.40	1.50	2.37	1.19	0.79	0.54
Renting of machinery and equipment	71	3.80	0.84	1.42	1.05	0.79	1.63	0.53	0.79	1.87	1.32	1.05	0.79	0.41
Computer and related activities	72	6.77	0.84	1.52	1.33	1.18	1.03	0.59	0.74	1.21	0.74	1.03	1.33	0.30
Research and development	73	8.68	2.15	2.12	0.69	1.38	0.76	0.23	11.17	2.64	1.73	0.81	0.92	3.06
Other business activities	74	5.71	0.98	1.68	0.88	1.05	1.47	0.53	1.40	2.08	1.23	1.23	0.70	0.45
Non-financial business services	50-74	5.30	0.99	1.73	0.77	1.18	2.00	0.58	1.23	1.83	1.53	0.82	0.91	0.48

Sources: Eurostat New Cronos and own calculations.
Note: The euro area column reports the average number of employees per firm in the euro area (no data were available for Greece). All other entries are the ratio of the country-sector value to the corresponding value for the euro area. The last column reports the standard deviation of the country values.
1) Firm data for the sectors 50, 51, 52 and 55 refer to 2000.
2) Firm data for the sectors 61, 62 and 63 refer to 1997.
3) Firm data for sector 60 refers to 2000.

4 THE EMPIRICAL LINK BETWEEN SERVICES MARKET COMPETITION, LABOUR PRODUCTIVITY GROWTH AND VALUE ADDED PRICE CHANGES[45]

4.1 INTRODUCTION

This chapter investigates the link between the proxies of services market competition discussed in Chapter 3, labour productivity growth and (relative) value added price changes in the selected services sectors.

A general description of the estimated equations is presented in Section 4.2, while results of pooled regressions (see below) are discussed in Section 4.3.

The rest of the chapter focuses on five higher-level aggregate services industries: (1) wholesale and retail trade (Section 4.4); (2) hotels and restaurants (Section 4.5); (3) transport and storage (Section 4.6); (4) post and telecommunications (Section 4.7); and (5) real estate, renting and business activities (Section 4.8). Exploring lower-level aggregates within each services industry would have been

45 Prepared by Mika Kuismanen, Moreno Roma and Elena Yusupová.

interesting to take into account the specificity and heterogeneity of each services industry (see Chapter 2), but this was in practice not feasible given existing data constraints faced in the construction of the proxies of services market competition at a lower level of aggregation.

It is worth stressing that results should be interpreted with caution given that a deeper empirical analysis would be needed to substantiate the findings and to test their robustness. More generally, it is important to keep in mind that establishing a link between competition and labour productivity growth could also be complicated by the link between competition and innovative activity, which in turn affects firms' labour productivity via dynamic efficiency (see Box 6). There is increasing evidence (Aghion et al., 2002) of a non-linear relationship between competition and innovation, with both very high and very low levels of product market competition giving rise to lower incentives to innovate and therefore lower dynamic efficiency (inverted U-shaped relationship). Finally, caveats concerning the difficulties of measuring value added and prices in the services sector must be borne in mind (see Annex 2).

In this chapter, value added price changes rather than the HICP are used given our interest in analysing data since the start of the 1990s and that comparable HICP data across countries are available only since 1996 (see Section 2.2.3). Moreover, it is not possible to fully link the HICP categories of the HICP services component to the NACE Rev. 1 classification of services industries used to construct the proxies of services sector competition.

4.2 SPECIFICATION OF THE ESTIMATED EQUATIONS

4.2.1 LABOUR PRODUCTIVITY GROWTH

To estimate labour productivity growth rates, the following specification is used:

$$\Delta Ln\ (LP)_{ijt} = a_j + X'\beta + \gamma_j\ COMP_{ijt} + \eta_i + \varepsilon_{ijt}$$

where the subscript i refers to the country, j to the sector and t to time. $\Delta Ln\ (LP)_{ijt}$ is the time difference of the logarithm of labour productivity (computed as real value added divided by total employment). X represents a matrix of country-specific control variables (see description below) which, according to economic theory and the empirical findings, are deemed to be relevant in explaining labour productivity growth. $COMP_{ijt}$ represents the set of proxies of services sector competition as described in Chapter 3 (see description below) which are used as additional explanatory variables. Some proxies of competition are only country-specific (i.e. the subscript j is not relevant) and, in some cases, changes rather than levels of competition are also tested. a_j indicates sector-specific dummies, η_j represents country dummies and ε_{ijt} is the error term.

The quantitative analysis covers the 1990-2003 period[46] and is first carried out across sectors (i.e. developments in each sector j across the euro area countries are analysed) and then observations are pooled together for sectors j = 50-52, 55, 60-63, 64 and 70-74 (i.e. all sectors and euro area countries are analysed over time).

The following is a description of the country-specific control variables X (sources are indicated in brackets):

– *Rd:* Gross domestic expenditure on R&D as a percentage of GDP (Eurostat Structural Indicators).[47] R&D expenditures are likely to bring innovations which should consequently lead to an increase in dynamic efficiency and productivity.

– *Ed:* Education in terms of average years of school[48] (Barro and Lee, 2001). Both *Rd* and

46 Due to data limitations in some euro area countries, it was thought not to be worth carrying out a quantitative analysis for the 1980-1990 period.

47 We did not use sectoral R&D data given that they are not available for all euro area countries.

48 However, this variable had to be dropped because of an insufficient number of observations.

Ed are expected to positively affect total factor productivity growth and, in turn, indirectly affect labour productivity growth.

– *Epl:* Overall Employment Protection Legislation (OECD). Labour market institutions, such as Epl, are likely to affect labour productivity growth, especially in the services sector where the use of part-time and fixed-term contracts is common, for example in the wholesale and retail sector (see Annex 2). Empirical work tends to show that rigid labour market institutions may hamper labour productivity growth (Scarpetta et al., 2002).

– *GdpGap:* Logarithm of real GDP per capita at time t minus the logarithm of the euro area real GDP per capita at time t-1 (European Commission).[49] The use of this variable should reflect catching-up phenomena, i.e. countries with a wider GDP per capita gap with respect to the euro area average should exhibit higher labour productivity growth. Including the initial value of GDP per capita in 1990 (following the growth theory literature) was also tried, but this procedure eliminates all the time variance from the variable in question.[50] Also, the use of a simple GDP per capita variable could pose an endogeneity problem although this problem should not be that severe when modelling sectoral rather than overall labour productivity. The use of *GdpGap* further alleviates possible endogeneity problems.

– *Og:* Output gap (current minus potential output) (European Commission) is used in order to take into account cyclical fluctuations which could affect labour productivity growth over time.

The following is a description of the sector-specific proxies of services sector competition $COMP_{ijt}$ (for a detailed description, see Chapter 3):

– *Prmarg:* The level of gross profit margin.

– *Mkup:* The level of mark-up including income of the self-employed.

– *FDI:* Indices of FDI restrictions.

– *Open:* Trade openness.

– *Nic:* The indicator of sectoral regulation as in Nicoletti and Scarpetta (2003) and OECD (2005e) and other sectoral indicators of regulation for the retail sector and for professional services.

– *Nfirm:* Number of firms (European Commission). A large or growing firm size might result in: (i) economies of scale and more innovations with a positive impact on labour productivity growth; and (ii) a decline in competition with negative effects on labour productivity growth. The overall effect on labour productivity growth may therefore be ambiguous.

The following is a description of the country-specific proxies (all from the OECD Product Market Regulation database[51]):

– *Pmr* (overall product market regulation), *sc* (state control), *pc* (price control), *be* (barriers to entrepreneurship), *bc* (barriers to competition), *sab* (sectoral administrative barriers), *bti* (barriers to trade and investment), *ob* (ownership barriers).

49 Similar results hold when using the euro area GDP per capita at time t rather than at time t-1. The intuition behind the use of the euro area GDP per capita at time t-1 is that given that *GdpGap* represents a catching-up variable some time-lag would occur in the process of catching-up towards the euro area mean (for example in terms of adoption of new technologies).

50 This implies that when a fixed effects specification is chosen the variable is dropped from the estimation.

51 The variables taken from the OECD PMR database are available for 1998 and 2003. Therefore, data have been linearly interpolated between 2003 and 1998 and have been assumed constant beforehand (the same procedure was applied to the indicator of retail regulation and regulation in professional services). Although this methodology is not fully satisfactory, this was the only possibility in order to use the data for a sufficient number of observations.

Changes in the level of each of the proxies listed above have also been tested (Δ before the name of the proxy in the description of the results indicates the first difference).

In order to have a longer time period and to deal with issues of collinearity among the proxies of competition, for each equation a parsimonious specification was retained, based on the Hausman (1978) specification test. In all sectoral equations, fixed effects models were used. In the pooled model, a random effects model with country dummies is estimated.

4.2.2 VALUE ADDED PRICE CHANGES

Regarding value added price changes, the interest lies in investigating if services market competition is a relevant factor in explaining services price changes across countries and sectors. However, in the medium to long run, absolute price level changes are driven by monetary developments and country-specific characteristics. The quantitative analysis therefore focuses on relative price changes, i.e. price changes in each services sector analysed relative to overall economy price changes, and it investigates if relative price changes are affected by the proxies of services sector competition.

More specifically, to estimate relative price changes the following specification is used:

$$\pi_{ijt} - \pi_{it} = R\pi_{ijt} = \alpha_j + \beta_j ULCrg_{ijt} + \gamma_j COMP_{ijt} + \eta_i + \varepsilon_{ijt}$$

where the subscript i refers to the country, j to the sector and t to time. $R\pi_{ijt}$ is the relative price change, i.e. the difference, for each point in time, between the value added price change in sector j and country i minus the overall price change in country i. $ULCrg_{ijt}$ represents the increase in unit labour costs in sector j and country i relative to the overall economy unit labour cost growth in country i. $COMP_{ijt}$ represents the set of proxies of services sector competition, as described above for the labour productivity growth equations. As an additional proxy, relative profit margins (*Prmargr*) have been computed as the difference, for each point in time, between the level of profit margins in sector j and country i minus the level of overall profit margins in country i.[52] α_j indicates sector-specific dummies, η_i represents country dummies and ε_{ijt} is the error term.

Relative price change equations were estimated using either fixed or random effects specifications after checking the appropriateness of the estimation technique using the Hausman test. As for the productivity equations, the quantitative analysis covers the 1990-2003 period and is first carried out across sectors and then observations are pooled together for sectors j = 50-52, 55, 60-63, 64 and 70-74.

4.3 POOLED REGRESSIONS

Results of pooled regressions including sectors 50-52, 55, 60-63, 64 and 70-74 for labour productivity growth are reported in Table 11A (first row). As expected, amongst the control variables, research and development (*Rd*) and employment protection legislation (*Epl*) affect labour productivity growth positively and negatively, respectively. Other macroeconomic variables such as the output gap and the gap in GDP per capita were not statistically significant. Amongst the competition proxies, sector-specific regulation (*Nic*) proves harmful to labour productivity growth, confirming previous empirical findings (see Section 1.2).

Results of pooled regressions for the value added relative price changes are reported in Table 12. The relative unit labour cost growth variable (*ULCrg*) was not statistically significant. This result differs from what is found in sectoral regressions (see below), where the relative unit labour cost growth is almost always statistically significant, possibly suggesting a heterogeneous impact of this variable across the sectors considered. The level of the profit margin (*Prmarg*), or the relative

52 For the other proxies of services market competition, calculating a relative measure of services sector competition for sector j relative to the overall economy was generally not possible due to data limitations.

difference between the level of the profit margin in each investigated services sector relative to the overall economy (*Prmargr*), have a positive and significant coefficient indicating that higher (relative) profit margins are linked to more pronounced relative price increases in the services sector (columns 1 and 2). Results should however be treated with caution given the caveats associated with this profitability measure (see Chapter 3). Amongst the other proxies of competition, FDI has a positive impact on relative price changes, suggesting that stricter FDI restrictions could explain higher relative price changes in services compared with the overall economy[53] (column 3). Other sector-specific proxies of services market competition were not statistically significant in the pooled regressions. The change in the economy-wide indicator of barriers to entrepreneurship (Δbe) indicates that stricter regulations in terms of barriers to entrepreneurship explain higher relative price increases in the services sector.

To gain more insights into sectoral specificities, the following sections (from Section 4.4 to Section 4.7) present results for each of the selected services sectors.

53 Due to limited observations for FDI restrictions over time, the number of observations of this specification is however quite limited.

Table 11 Explanatory factors of labour productivity growth in the services sectors

(estimation period 1990-2003)

Sector	α_j	Country-specific control variables			Proxies of services sector competition			R^2	Obs.
		$GdpGap_{it}$	Rd_{it}	Epl_{it}	Nic_{ijt}	Pmr_{it}	Sab_{it}		
a) Fixed effects model and a pooled regression on the basis of a random effects model									
Pooled	3.71 ***		0.23 ***	-0.01 ***	-0.01 ***			0.25	502
Wholesale and retail (50-52)	3.42 ***	0.16 *	0.07 ***	-0.06 ***	-0.02 *	-0.05 **		0.43	132
Hotels and restaurants (55)	2.77 ***	0.01	0.04	0.08 ***			0.04	0.12	131
Transport and storage (60-63)	3.96 ***		0.12 **		-0.06 ***	-0.07		0.27	112
Post and telecommunications (64)	4.67 ***		0.35 ***	-0.25 ***	-0.08 ***		-0.1 ***	0.09	111
Real estate, renting and business activities (70-74)	4.24 ***	-0.4	0.00	0.04 **		0.20 ***		0.02	131
b) Fixed effects model									
Wholesale and retail	3.43 ***	0.07	0.07 ***	-0.05 ***	-0.02 *	-0.26 **		0.43	132
Transport and storage	3.80 ***		0.13 **		-0.07 ***	-0.08 *		0.27	112
Post and telecommunications	4.52 ***		0.37 ***	-0.28 ***	-0.09 ***		-0.3 ***	0.03	111

Notes: One, two and three asterisks after the coefficients indicate statistical significance at 10%, 5% and 1% respectively. For a description of the variables, see Section 4.2.1.

Table 12 Explanatory factors of value added relative price changes in the services sector

(estimation period 1990-2003)

	(1)	(2)	(3)	(4)	(5)	(6)
Pooled regression (sectors 50-52, 55, 60-63, 64 and 70-74)						
α_j	-0.0128**	-0.0001	-0.0186*	-0.0031		
$ULCrg_{ijt}$	0.0008	0.0011	0.0012	0.0019		
$Prmarg_{ijt}$	0.0324**					
$Prmargr_{ijt}$		0.0388***				
FDI_{ijt}			0.0530**			
Δbe_{it}				0.0697**		
No of observations	492	492	86	546		
R^2	0.25	0.25	0.42	0.25		
Model	RE	RE	RE	RE		
Wholesale and retail trade (50-52)						
α_j	-0.0075					
$ULCrg_{ijt}$	0.377***					
$\Delta Prmarg_{ijt}$	0.1544**					
No of observations	134					
R^2	0.27					
Model	RE					
Hotels and restaurants (55)						
α_j	0.0193***	0.0099*	0.0050			
$ULCrg_{ijt}$	0.3109***	0.3522***	0.6614***			
$Prmarg_{ijt}$	0.0951**					
$\Delta Prmarg_{ijt}$		0.1048**				
$\Delta Nfirm_{ijt}$			-0.0094*			
No of observations	136	134	60			
R^2	0.18	0.34	0.79			
Model	FE	RE	RE			
Transport and storage (60-63)						
α_j	-0.0884***	-0.0002	-0.0016	-0.0366*	-0.0021	
$ULCrg_{ijt}$	0.1489	0.1674*	0.4147***	0.3560***	0.2998***	
$Prmarg_{ijt}$	0.2667***					
$Prmargr_{ijt}$		0.3268***				
$\Delta Prmarg_{ijt}$			0.5284***			
$Open_{ijt}$				0.0449*		
ΔPmr_{it}					-0.0849**	
No of observations	67	67	66	89	106	
R^2	0.09	0.10	0.29	0.26	0.32	
Model	FE	FE	RE	FE	FE	
Post and telecommunications (64)						
α_j	-0.0704***	-0.0305**	-0.0410***	-0.0053	0.0016	-0.0107
$ULCrg_{ijt}$	0.3654***	0.3574***	0.4104***	0.3140***	0.4446***	0.3417***
$Prmarg_{ijt}$	0.1213***					
$Prmargr_{ijt}$		0.1192**				
FDI_{ijt}			0.0510*			
ΔNic_{ijt}				0.0208**		
$\Delta Open_{ijt}$					-0.1419**	
ΔOb_{it}						0.1285**
No of observations	67	67	31	106	83	106
R^2	0.31	0.29	0.36	0.27	0.41	0.33
Model	RE	RE	FE	RE	RE	RE
Real estate, renting and business activities (70-74)						
α_j	-0.1020***	-0.0519***	0.0099***	-0.0150	-0.0046	0.0184***
$ULCrg_{ijt}$	0.0162	0.0548	0.1279**	0.1984***	0.2129***	0.2418***
$Prmarg_{ijt}$	0.1830***					
$Prmargr_{ijt}$		0.2254***				
$\Delta Prmarg_{ijt}$			0.3642***			
Nic_{ijt}				0.0095*		
Bc_{it}					0.0161*	
ΔBc_{it}						0.1876***
No of observations	136	136	134	160	148	147
R^2	0.04	0.10	0.07	0.06	0.17	0.42
Model	FE	FE	FE	FE	RE	RE

Notes: One, two and three asterisks after the coefficients indicate statistical significance at 10%, 5% and 1% respectively. The choice between the fixed effects (FE) and random effects (RE) models was based on the Hausman test. Where an RE model was selected, country dummies were used in most of the specifications to improve the efficiency of estimation. In the pooled regression, sectoral dummies to control for sector-specific effects have been used. For a description of the variables, see Section 4.2.2.

4.4 WHOLESALE AND RETAIL TRADE

The wholesale and retail trade sector (50-52) is an important part of the services sector. Although an international comparison of sectoral labour productivity developments must be made very cautiously because of differences in the structure of the labour market (for example, temporary work is very common in the retail sector in France; see also Annex 2), Table 13 shows a dramatic increase in wholesale and retail sector labour productivity growth in the US, rising from below 2% average annual growth in the 1980s to above 5% after 1996, while in the euro area labour productivity growth in this services sector decreased. How can one explain the labour productivity increase in the US? And why did the euro area not experience a similar productivity jump? These questions have been widely explored in the literature.

One part of the explanation is economies of scale. Wholesale and retail trade is the services sector with the largest number of firms and the lowest number of employees per firm in the euro area. However, Van Ark et al. (1999) indicate that the US retail outlets were three times larger in 1992 in terms of the number of employees per outlet and five to six times larger in terms of sales per establishment than the outlets in France, Germany or the Netherlands.

Another, complementary, answer is that the increase in US retail labour productivity has been based on the introduction of new technologies in this traditionally labour-intensive sector (especially in the US) during the 1980s and 1990s, coupled with improvements in training and business organisation, as demonstrated by the Wal-Mart example. In contrast, the European retail sector started introducing new technologies six to ten years later than in the US. The reason behind the delay seems to be the stricter regulation of the sector in Europe, which has restricted both concentration and competition and hence the rewards to innovation and efforts to enhance efficiency (see McGuckin et al., 2005).

Table 13 Annual average labour productivity growth in wholesale and retail trade

(percentages)

	1981-1990	1991-2003	1996-2003
United States	1.9	3.9	5.5
Euro area	1.5	1.1	0.7

Sources: OECD STAN database, GGDC database, NCBs and own calculations.

For large retailers, regulation mainly relates to land usage and shop opening hours.[54] In that respect, regulation of the retail sector in Europe is much stricter than in other OECD countries. Moreover, it is not harmonised across Europe, which further limits the scope for economies of scale (as shown by the smaller average size of European retail firms compared with those in the US) and reduces incentives for innovation. In spite of those hurdles, the overall trend in Europe since the mid-1990s has been towards an increase in concentration through mergers and acquisitions. It is therefore crucial that competition is favoured locally, for example through openings of new shops. Accordingly, European countries started liberalising the sector in the early 1990s, which effectively facilitated to some extent the entry of large retail outlets, as well as the widespread adoption of new technologies.

However, the path towards deregulation has slowed down recently caused by, in many cases, the demand for protection from competition from small shopkeepers. Some countries, like Spain, have introduced new restrictions on shop opening hours, while others (like France and, again, Spain; see Box 5) have tightened the zoning laws in order to restrict the entry of new large retail outlets.

As documented in empirical studies, economies of scale help to explain productivity growth differences also across the euro area countries. Using as a proxy of firm size the number of

54 Boylaud (2000) found an overall positive impact of easing the opening hours and store size regulation on the retail sector's performance and efficiency in OECD countries.

employees per firm in a given sector, it is found that the countries with on average larger wholesale and retail outlets achieve higher labour productivity growth (see Chart 21).

Results of the estimation of the productivity equation in the retail and wholesale sector are reported in Table 11A. The OECD sectoral indicator of regulation for the retail sector (*Nic*) negatively affects labour productivity growth.[55] This holds also when controlling for some key determinants of productivity growth, such as R&D expenditure and the GDP per capita gap with the euro area, which have the expected positive sign. The OECD index of employment protection legislation (*Epl*) negatively affects labour productivity growth, showing that stricter legislation hampers productivity growth, a result that appears to be robust across the sectors examined. Moreover, tighter overall product market regulation (*Pmr*) negatively affects labour productivity growth. Similar results are obtained when the changes rather than the levels of the competition variables are used (see Table 11B).[56]

Average value added price changes in wholesale and retail trade in the euro area show a similar decreasing pattern over time as for total services, exhibiting a negative wedge close to 0.5 p.p. with respect to total services in the 1990s. Results of the estimation of value added relative price changes in the wholesale and retail trade sector are presented in Table 12. Relative price changes are driven by the relative growth in unit labour costs (*ULCrg*) and by the changes in the level of profit margins (*ΔPrmarg*) in this sector. Proxies capturing the degree of regulation or sectoral proxies of competition were not statistically significant in explaining relative price changes.

All in all, one may argue that competition, measured by a range of indicators (in particular indicators of regulation), is an important factor to explain labour productivity growth developments in this sector. However, with the exception of corporate profit margins, the proxies of services sector competition examined do not seem to significantly influence (relative) price changes in the wholesale and retail trade sector.

4.5 HOTELS AND RESTAURANTS

Over the last two decades, the average value added share of hotels and restaurants (55) in the euro area slightly increased, from 2.3% in the period 1981-1990 to 2.8% in 1996-2003. This sector generally recorded negative labour productivity growth (-1.6% in the period 1996-2003), which in the literature is attributed to its labour-intensive character, domestic orientation and mostly small firm size. In the 1996-2003 period, the average value added price increase in the euro area in this sector (4.4%) was significantly higher than for total services (1.9%). This sector is characterised by a relatively low mark-up and profit margin, although these values were still higher than in manufacturing.

Most of the economy-wide competition indicators are only weakly associated with productivity growth in this sector (a partially stronger link can be found for barriers to entrepreneurship). For labour productivity growth it was not possible to estimate a satisfactory equation (see Table 11A).[57]

Value added relative price changes in hotels and restaurants (see Table 12) are driven by the relative growth in unit labour costs (*ULCrg*) and by the level of relative profit margins (column 1). Changes in the level of profit margins (*ΔPrmarg*, second column) in this sector are also statistically significant. Other

55 The indicator is however significant at the 10% level only, which may also be due to the fact that it refers to the retail sector only, whilst labour productivity growth refers to both the retail and the wholesale sector.

56 Given the interpolation of some of the OECD indicators of regulation over time, results should however be treated with caution.

57 This is not to say that all of the above-mentioned variables are statistically insignificant. On the contrary, some variables, like employment protection legislation (Epl), seem to work well as a single explanatory variable, but with other variables this is not the case. In addition, none of the proxies for services market competition proved to be a good explanatory variable.

proxies capturing the degree of regulation or sectoral proxies of competition were not statistically significant in explaining relative price changes, with the exception of changes in the average firm size (*ΔNfirm*), which tend to indicate that an increase in average firm size could reduce relative price changes in this sector.

The results of the analysis carried out indicate that it is in general not possible to establish a precise link between labour productivity growth or relative price changes and the competition proxies examined for this sector. Most likely, some measurement problems (see Annex 2) or the existence of an underground economy in this industry could account for this difficulty. Moreover, finding satisfactory proxies of services market competition in hotels and restaurants was particularly challenging.

4.6 TRANSPORT AND STORAGE

The transport and storage industry (60-63) is a relatively small sector (ranging between 2.4% of value added in Ireland to 7.3% in Finland in the period 1991-2003) and consists of heterogeneous industries, with land transport accounting for broadly half or more of the entire transport and storage industry across the euro area countries. The peculiarity of this sector is that it includes some *network industries* (such as railway and air transport), characterised by the presence of a bottleneck infrastructure with natural monopoly characteristics (rail tracks, airports), which makes it more difficult to introduce and safeguard competition in these industries. Some network industries across euro area countries used to be state monopolies before being opened up to competition. As shown in Section 3.3.3, economies of scale play an important role in this industry and the market structure is characterised by a higher than average firm size.

Sectoral regulation in land and air transport decreased significantly since the beginning of the 1980s across the euro area countries (see Section 3.3.2). FDI restrictions in transport and storage also dropped significantly since the 1980s, indicating an increase in international competition. Several OECD product market indicators which affect the transport and storage industry, such as the indicator "sector-specific administrative barriers" or "ownership barriers", also point to a reduction of the regulatory burden over time.

Labour productivity developments across the euro area countries for which data are available[58] showed substantial heterogeneity across countries and over time. In general, labour productivity in the transport and storage industry decreased in the 1991-2003 period compared with the 1980s, with the exception of Ireland, Germany and Finland. This finding seems to contrast with the reductions of some barriers to international competition recorded in the same period discussed above.

Focusing on the level of competition in the 1996-2003 period when a broader set of competition proxies are available, it can be seen that labour productivity growth recorded by the euro area countries is negatively correlated to some indicators of regulations (taken from the OECD PMR database) as depicted in Chart 22. This would suggest that stricter regulation, in terms of administrative barriers or ownership barriers, could have prevented productivity growth in some countries such as Italy, France, Spain and Austria.[59]

Results of the estimation of the productivity equation in the transport and storage sector are reported in Table 11A. Countries with stricter regulation in this sector (Nic[60]) tend to have lower labour productivity growth. However, other economy-wide indices of product market regulation do not seem to matter (with the exception of changes in overall product market regulation; see Table 11B). The GDP per capita gap with the euro area and the index of

58 The euro area countries except Portugal, Greece and Belgium.
59 Results excluding Ireland, which generally appears as an outlier, confirm the findings discussed above.
60 Refers to sector 60 (land transport).

employment protection legislation are both not statistically significant.

Turning to value added price changes, in the period 1991-2003 price changes generally decreased in the majority of the euro area countries compared with the 1981-1990 period, whilst from the mid-1990s price developments across countries are more dispersed.

Results of the estimation of relative price changes in transport and storage (see Table 12) indicate that relative price changes are influenced by the relative growth in unit labour costs (*ULCrg*) taken together with relative profit margins (column 2) or changes in the level of profit margins (*ΔPrmarg*) (column 3). The level of openness (column 4) and overall changes in product market regulation (column 5) are statistically significant but the signs of the coefficients are difficult to interpret. One complication in analysing price developments in this sector is also related to the heterogeneity of services comprising this industry and to the fact that pricing policies may differ considerably across industries.[61]

In sum, services sector competition, measured by a range of indicators, is a relevant factor in influencing labour productivity growth in this sector. However, it is difficult to link the evolution of relative price changes to the proxies of services sector competition (with the exception of profit margins). One of the reasons for this result could be the heterogeneity of the industries and firms' pricing policies in this sector.

4.7 POST AND TELECOMMUNICATIONS

Labour productivity in post and telecommunications (64) increased significantly since the 1990s in most of the euro area countries. At the same time, the value added price changes recorded a sharp fall over time in the majority of the euro area countries and the HICP services related to communication showed a similar pattern since the mid-1990s.[62] The proxies of competition examined for this sector point to increased competition measured by a reduction in FDI restrictions, associated with the opening-up of this sector to international competition, to a reduction in the regulatory burden in terms of sectoral regulation (Nicoletti and Scarpetta, 2003) and to a significant increase in trade openness especially in the 1996-2002 period. However, available measures of profitability generally indicate an upward trend. A tentative explanation is that increased competition in this sector has been associated with a general downward trend in prices (at least in telecommunications), which was however accompanied by an increase in profitability, probably due to increased efficiency, product innovation and the use of ICT technologies and a substantial increase in demand.

Results of the estimation of the productivity equation in the post and telecommunications sector are reported in Table 11A. As one would expect, R&D in this dynamic sector is a positive driver of productivity growth. The OECD sector-specific indicator of regulation (*Nic*) and sector-specific administrative burden (*sab*) both hamper labour productivity growth. It is hard to find a clear economic interpretation why *sab* works better than, for example, overall product market regulation (*Pmr*). It should however be noted that *Pmr* is also statistically significant.

Results of the estimation of the value added relative price changes equation in the post and telecommunications sector are reported in Table 12. Higher relative unit labour cost growth positively affects relative price changes in this sector. The level of profit margins (column 1) or their relative level with respect to the overall economy (column 2) also positively affect relative prices, as found in several other sectors

61 In some services industries within this sector, such as road transport, (relative) price changes and labour productivity developments may also be influenced by environmental regulation, which is not taken into account in this report.

62 Postal services, which constitute a small share of the HICP services related to communication, did not however share this downward trend in inflation rates across the euro area countries.

examined. Interestingly, amongst the proxies of competition higher FDI restrictions seem to be associated with higher relative prices in this sector (column 3). A similar result is found for changes in the sectoral indicator of regulation (*ΔNic*, column 4), indicating that tighter regulation could positively affect relative price changes. An increase in sectoral trade openness is also associated with lower relative prices in post and telecommunications (column 5).

It is important to keep in mind that the technological progress embedded in telecommunications products could have brought relative price decreases which go beyond those that would be explained by competition.

All in all, results indicate that stricter regulation in post and telecommunications hampers labour productivity growth. For relative price changes, results suggest that increased services sector competition (in terms of lower sectoral regulation, higher trade openness, etc.) negatively affects relative price changes in this sector.

4.8 REAL ESTATE, RENTING AND BUSINESS ACTIVITIES

As seen in Section 3.1, the real estate, renting and business activities industry (70-74) consists of heterogeneous services, namely real estate activities (70), which roughly account for half of the total, renting of machinery and equipment (71), computers and related activities (72), research and development (73) and other business activities (74), which mainly include professional services. Two of these five sub-industries, sectors 70 and 74, accounted for roughly 80% to 90% of the total real estate, renting and business activities value added in the majority of euro area countries in the 1996-2003 period. As seen in Section 2.1, real estate, renting and business activities have grown significantly in the euro area in terms of value added share, increasing by more than 5 percentage points in the period 1996-2003 (since 1981-1990) and exceeding 20% of total value added in the same period. Even more impressive was the increase in the euro area employment share of this sector in the same period, almost doubling since the 1990s and exceeding 10% of total employment in the 1996-2003 period.

The real estate, renting and business activities sector presents two distinctive features (see Section 2.2) which are common across most of the euro area countries and over time: negative or very low labour productivity growth rates and value added price changes generally higher than for total services.

Looking at measures of sectoral regulation analysed in Section 3.3, the overall index of sectoral regulation for professional services developed by Paterson et al. (2003) is negatively correlated with productivity growth in this sector in 2003. A similar result holds for the OECD sectoral indicator of regulation for professional services (see Chart 23), suggesting that countries with a less restrictive regulatory framework recorded better productivity performances (in relative terms given that labour productivity growth is negative across all euro area countries).

A role is played by the market structure given that the average firm size in this sector is positively related to productivity growth in the 1996-2003 period and negatively related to the value added price changes in the same period.

For labour productivity growth, it was however not possible to estimate a satisfactory equation (see Table 11A).[63]

Results of the estimation of the value added relative price changes equation in real estate, renting and business activities are reported in Table 12. Relative unit labour cost growth is not always statistically significant. The level or change of profit margins, or their relative level,

63 This is not to say that all of the above-mentioned variables are statistically insignificant. On the contrary, some variables, like employment protection legislation (*Epl*), seem to work well as a single explanatory variable but with other variables this is not the case.

positively affect relative price changes in this sector. Amongst the proxies of competition, the sectoral indicator of regulation (*Nic*, column 4) is statistically significant at the 10% level. Tighter regulation in this sector is related to higher relative price changes. Overall barriers to competition (*bc*, column 5) appear also to be detrimental to relative price changes in this sector.

All in all, countries with a less restrictive regulatory framework in this sector seem to record better productivity performances, but results of this investigation cannot be confirmed by the quantitative analysis. Regarding relative price changes, the empirical analysis suggests that stricter sectoral regulation and, in general, limited competition are associated with higher relative price changes in this sector.

4.9 CONCLUSIONS

This chapter examined for the selected services sectors how services market competition measured by several proxies has affected labour productivity growth and relative price changes across euro area countries and over time.

Regarding labour productivity growth, the results showed that after taking into account some of its key macroeconomics determinants (R&D expenditure, the GDP per capita gap with the euro area, etc.) services market competition, measured by a range of indicators (FDI restrictions, OECD indicators of sectoral regulation, etc.), is an important factor explaining labour productivity growth in the majority of industries analysed. In particular, limited services market competition appears to generally dampen labour productivity growth in the services sector across the euro area countries. Results differ across sub-sectors however and in the case of hotels and restaurants and real estate, renting and business activities the proxies of services market competition are generally not statistically significant.

With regard to value added relative price changes, in all sectors higher relative profit margins are associated with higher relative price increases. These results should however be cautiously interpreted given the caveats associated with profitability as a measure of competition (see Chapter 3). Moreover, in wholesale and retail trade, hotels and restaurants, and transport and storage, the other proxies of services market competition are not statistically significant in explaining relative price changes. However, in post and telecommunications and real estate, renting and business activities, tighter sectoral regulation and some indicators of economy-wide product market regulation are associated with higher price increases or lower price decreases, suggesting that increased services market competition has a dampening impact on relative price changes in these sectors. Furthermore, as shown in studies related to the Eurosystem's Inflation Persistence Network, more competitive services markets could also contribute to the reduction of price stickiness in services and in turn facilitate the adjustment process of an economy from manufacturing to services and eventually increase the resilience to economic shocks. Services market competition seems however to impact services industries in a substantially heterogeneous way.

Finally, caveats concerning the difficulties of measuring value added and prices in the services sector must be borne in mind (see Annex 2) and caution is required when interpreting the empirical results. A deeper empirical analysis would be needed to substantiate the results and to test their robustness.

Box 5

EFFECTS OF REGULATION IN THE RETAIL TRADE SECTOR: THE CASES OF FRANCE, SPAIN AND ITALY[1]

Different aspects of the impact of regulation of a key services sector such as retail trade on the sector's economic performance can be studied using the experiences of France, Spain and Italy. Although their market structure is very different (e.g. retail sales are concentrated in France, but not in Spain), the results of the reversal in the liberalisation trend of the mid-1990s in these countries have been a fall in new entries of large retail stores, which has dampened competition, and an increase in margins. In France, the impact on employment is very difficult to disentangle from the effects of more general policy measures, such as lower social contributions and the working-time reduction. In the case of Spain, however, there is mild evidence of a negative impact of the new regulation on retail employment growth over the period. This negative impact of stricter retail regulation on employment may have also been observed in Italy during the short-lived deregulation experience of one Italian region (Marche, from 1999 to 2002) following the introduction of the Bersani Law. The impact on labour productivity of the changes in regulation in the countries in question has not been particularly clear-cut.

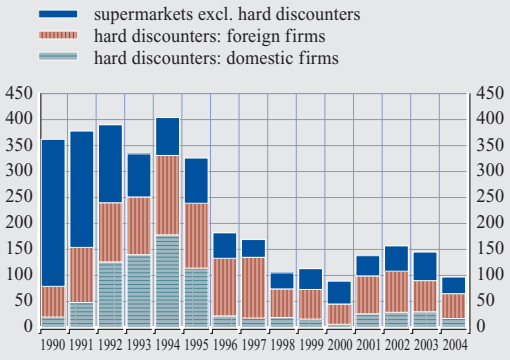
Apart from the impact on employment, the experience of France, Spain and Italy shows that the change in regulation introduced in order to protect small traditional shops from the competition of large stores has increased incumbents' market power and price margins, pushing retail prices upwards. Moreover, it has failed in its aim: in France, it did not prevent the decrease in the market power of small shops, whereas in Spain and Italy, employment growth in the retail sector has slowed down.[2]

In France, the changes in regulation concern land usage and contracts between producers and retailers.[3] In 1974, the Royer Law submitted the opening of retail stores above 400m^2 to the control of a local commission. Although these local commissions had legal monopoly rights over the land, they were quite ineffective at restricting the entry of large stores since the municipalities wanted to enlarge the tax base in the midst of the budget shortfalls of the 1980s. The result was that at the beginning of the 1990s France had more retail square metres per 1,000 inhabitants than the US.[4] However, the law prevented foreign investors from entering the French market and locally dampened competition, as firms already established in a given area were more likely to open more new shops.[5] In 1996 two new laws were introduced. The first law was known as the Raffarin Law, which tightened the previous Royer Law by reducing the threshold (from 400m^2 to 300m^2) and by requiring a licence from the local commission. It was supposed to protect small traditional shops from the competition of large stores. The second law, known as the Galland Law, reinforced the ban on selling at a loss that had existed in France since 1963.[6] Such a principle is highly controversial according to economic theory[7] but was supposed to protect small producers from the pressure of retailers. As it is very difficult to define costs in a vertically integrated sector, retailers collected more money from producers for so-called

1 Prepared by Paloma Lopez-Garcia and Valérie Chauvin.
2 In France, see the Canivet Report published on 18 October 2004.
3 There is no restriction on opening hours, except on Sundays, and in the latter case, shops can ask for a dispensation. The main difficulty may come from labour legislation.
4 McGuckin, Spiegelman and van Ark (2005), using data from Templeton College, find 71m^2 of retail stores per 1,000 inhabitants in France against 40m^2 in the US and 7m^2 in the UK.
5 See Bertrand and Kramarz (2002).
6 French law forbids retailers from setting prices below wholesale prices.
7 See Tirole (2000).

Chart A Food retailers in France – new shops over 400m²

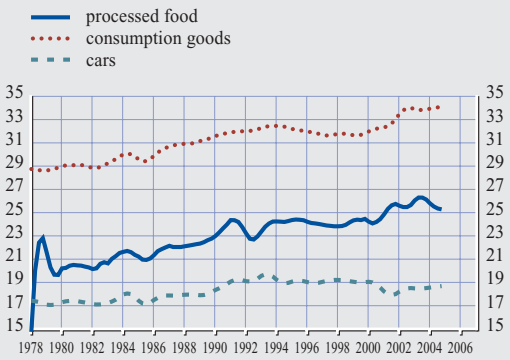
(number of shops)



Source: National accounts.

Chart B Trade margins on final consumption goods in France

(percentage of consumption including taxes)



Source: Quarterly national accounts, computation by the Banque de France.

commercial cooperation, and these sums were not used to lower prices because of the Law.[8] The Law included other restrictions like the impossibility to sell at "excessively low prices", aimed at limiting the offers in own-brand products, hence benefiting the well-established brand names, and the impossibility for producers to charge different prices to different retailers, which reduced the incentives for retailers to obtain lower prices from their providers, as these prices would apply to any other retailers.

The result of both laws can be seen in Charts A and B. The first one shows the entry of new food retailers over 400m² in France. Right after the introduction of the Raffarin Law, there was a dramatic drop in the opening of new large stores in France. However, the law only partially reached its aim as the number of new shops opened by hard discount chains owned by foreigners hardly decreased so that they gained market shares (70% of the new supermarkets opened in 1996 were hard discounters). The second effect of the two laws was an increase in prices and margins due, on the one hand, to the direct impact of the Galland Law and, on the other hand, to the reduction in competitive pressure on incumbents given the new barriers to entry imposed by law. Note that the margins in the French automobile trade – included in the graph as a benchmark – remained stable over the same period.[9]

Regarding Spain, regulation changes concerned opening hours and land usage. A decree-law was passed in 1985 by the Parliament, establishing total freedom for firms to set their store opening hours. However, the Spanish State is quite decentralised and many of its regions ("autonomous communities") have a say in issues related to domestic trade. For this reason, after the 1985 law several regions decided to establish limits on store opening hours in their territory. In several sentences of 1993, the Spanish Constitutional Court decided in favour of the regions, allowing the central government to set the general framework for economic activity

8 The shift from downstream to upstream margins appears clearly in Cayssials (2005).

9 As hard discounters gained market share, producers documented the bad practices of traditional supermarkets via surveys and consumers complained about high prices in a period of low economic growth. In 2004, the Government favoured agreements between producers and retailers that led to a 1.2% decrease of prices in supermarkets. The latter prices have now stabilised, in sharp contrast with the 2.3% annual growth from 1998 to 2003. The Jacob Law voted in July 2005 re-establishes the possibility for different selling conditions for producers, redefines the threshold of sale at a loss, gives a clearer definition of trade cooperation and increases the judicial power of producers. However, it did not change land usage, contrary to the advice in the Canivet Report.

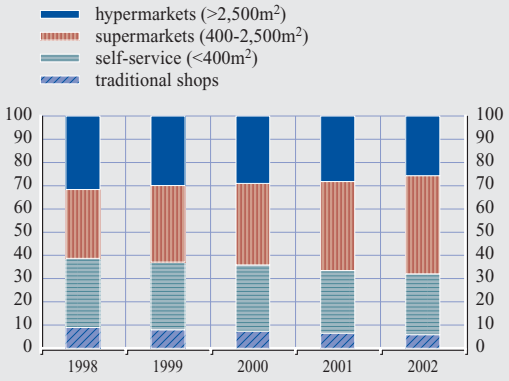
Chart C Trade margins in Spain

(calculated as gross value added over sales)

Source: Central Balance Sheet Data Office, Banco de España.

Chart D Food sales by type of establishment in Spain

(percentage of sales)



Source: AC Nielsen.

but giving the regions power to regulate domestic trade in their territories. Following the ruling of the Court, the Government passed a new decree-law in December 1993 setting a minimum floor (in terms of weekly opening hours and the number of Sundays per year allowed) that the Spanish regions could then raise if they wished. As a matter of fact, most of the regions imposed the minimum opening times allowed by the central government.[10]

Additionally, in 1996 and as a response to the demand for protection by small shopkeepers, a new law was introduced requiring a second licence for large stores to operate. The power to grant, or not, the second required licence was given to the Spanish regions. Although large stores are defined at State level as having more than 2,500m^2, many regional governments reduced that threshold and extended the cases for which the licence was needed for enlargements, changes of ownership, etc. Moreover, 10 out of the 17 Spanish regions decided not to give any second licence at all for a certain period of time.

As Chart C shows, food retailers' margins increased in Spain after 1996, while the trade margins in the rest of the industry remained stable or decreased over the same period. This seems to suggest that the change in land usage has had more of an impact than the change in opening hours per se. Moreover, as Chart D shows, the market share of very large shops (i.e. those requiring a second licence) has declined, while the market share of shops just below the threshold has increased. Both phenomena suggest that the new restrictions have reduced the entry of new large stores, as happened in France. Moreover, Chart D shows that the market share of small shopkeepers has also declined over the period. Hence, although we do not know what would have happened without the new restrictions, it could be argued that the stricter zoning laws did not succeed in protecting small shopkeepers.

In Italy, the Bersani Law, issued in 1998, aimed at increasing competition and favouring the modernisation of the Italian retail trade sector by facilitating the opening of large outlets. The Law delegated to the regional governments the regulation of large store openings or enlargements.

10 In 2000 a new law was introduced to raise minimum opening times gradually until reaching again total freedom of firms to set their opening times in 2005. However, this was dependent on reaching an agreement with the regional governments on the issue, which has not been the case. In fact, the Government passed a new law on January 2005, which made the state-wide minimum regulation even stricter.

Contrary to the initial objectives, most of the Italian regions introduced substantial limits on the development of large stores, restricting the maximum number of large store openings and/or the maximum floor space that can be authorised in their territory.

Abruzzo and Marche,[11] two close and similar regions, adopted very different approaches: the first set tough restrictions on the opening and enlargement of large stores, while the second did not impose substantial entry barriers. After the inception of the regional regulations, and at least until 2002, the share of total retail trade employment in total population increased by 1% in Marche, and remained roughly constant in Abruzzo. The difference is due to the increase in employment in large shops in the region that liberalised entry. The evidence also shows that the increase of competitive pressure in the retail trade sector of Marche may have encouraged the development of more efficient small retail shops, e.g. chains of small shops owned by a single wholesaler, retail cooperatives, franchises, etc.

Hence, national experiences show that stricter retail regulation does not protect employment, deters investment and modernisation, and has an upward impact on prices as it prompts retailers to increase their margins.

11 Viviano (2005).

Box 6

SERVICES AND INNOVATION[1]

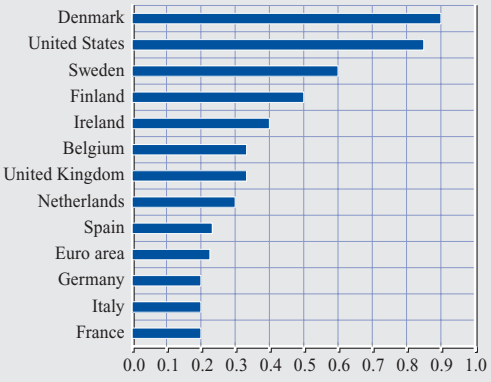
Growth and innovation in services are increasingly crucial to economic performance. ICT, in particular, enables productivity improvements in many sectors, including transport, communications, wholesale and retail trade and finance and business services. To be effective, investment in ICT needs to be accompanied by retraining of workers, organisational change and a competitive business climate. Knowledge-intensive services, such as R&D, computing and consultant services, have experienced very rapid growth and are important sources of innovation (Pilat, 2001).

Recent work confirms that services are more innovative than previously thought and in some areas they are more innovative than the average manufacturing firm (OECD, 2004a). Many services have become more innovative as a result of the implementation of ICT in service delivery, the competition-enhancing effects of regulatory reform and the increased role of networking and cooperation in the innovation process. Innovation surveys (Barkin et al., 1998) suggest that obstacles to growth and innovation in services are generally no different from manufacturing. Insufficient access to finance and risk capital, a lack of an internal capacity to innovate, insufficient expertise in applying ICT and high risk are typically the main barriers to innovation in both sectors.

Innovation surveys (see above) show that services firms innovate for similar reasons to manufacturing firms, namely to increase market share, to improve service quality and to expand product or service range. However, compliance with regulations and standards seems of less importance in services, owing perhaps to their more intangible nature. The same is obviously true

1 Prepared by Ilmo Pyyhtiä.

Services sector R&D expenditures relative to services sector GDP, average 1999-2001[1)]



Source: OECD Analytical Business Enterprise Research and Development database.
1) The data for Denmark and Ireland refer to 1999.

for reducing material input, energy or labour costs, because of the difference between the production processes in manufacturing and services. While material inputs and energy costs are of minor importance in most services, labour costs are important but may be difficult to reduce, given the importance of personal contact with the customer (Barkin et al., 1998).

A significant proportion of services sectors and firms still display very low levels of innovative activity, as measured by a variety of indicators, such as R&D intensity and a wide range of tangible and non-tangible investment expenditure related to innovation. Development of human resources is especially important to many services firms, given their high reliance on highly skilled and highly educated workers, as well as indications that a lack of highly skilled personnel is a major impediment to services innovation in most OECD economies. Although services sector firms are generally less likely to be innovative than manufacturing firms, they are becoming increasingly innovative and knowledge-intensive, and services such as financial intermediation and business services show above-average levels of innovation (OECD, 2005d).

More detailed analysis has been hampered by poor collection and availability of data on innovative activity in services. The problem is that much innovative expenditure and activity is in non-R&D areas where data availability is extremely poor (Sirilli and Evangelista, 1998). In addition, part of the process of "servicisation" is the trend in manufacturing firms towards providing services that are related to the manufactured products they produce. Vehicle manufactures, for example, have created finance and leasing subsidiaries to facilitate the purchase of their cars and trucks. They also have substantial maintenance and repair operations associated with after-sales care (Howells, 2001).

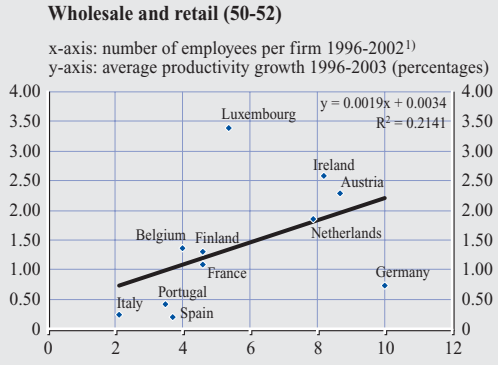
The innovation process consists of developing and putting into practice new or improved products, processes and services. It can range from radical innovations, based on new science and technology that open new markets, to more incremental innovations, which improve upon existing practice. Assessing innovation performance remains a challenge, owing to the lack of direct and comparable measures of innovation outcomes. One way to measure the volume of innovative activity at the national level is to look at total and/or private spending on R&D. However, one limitation is that investment in innovation may also include activities that are not necessarily recorded as formal R&D spending such as acquisition of high-tech equipment, training and product testing. Recent innovation surveys provide some insights into relative levels of innovative performance, but suffer from response biases that limit cross-country comparability (OECD, 2005d).

The chart presents services sector private R&D expenditures as a share of services sector GDP on average in the years 1999-2001. The innovation expenditures are quite small in the services sector and largest in countries where total innovation expenditures as a share of GDP are large.

One example of the influence of innovation on productivity and prices is electronic commerce. Recent studies show that the internet reduces prices by lowering search costs, reducing barriers to entry and shortening the supply chain (Wadhwani, 2000). These features should help boost productivity and cut profit margins. Economic theory predicts that high search costs allow prices to be above marginal costs in equilibrium. The internet-associated lowering of search costs should lead to lower prices. In several product areas, the internet lowers market entry costs, thereby limiting the price premiums sustainable by existing market participants by increasing actual or potential competition. It is also suggested that internet commerce is employing two major new distribution models – one where the end-user orders directly from a distributor, bypassing the retailer, and another which involves direct contact between end-users and producers such that there are no inventories of finished products anywhere in the system (De Prince and Ford, 1999). These effects of the internet influence prices only in the short run. The popularity of electronic commerce is not yet very high, except in some countries like Ireland where its share of the total enterprise turnover was 12.6% (Eurostat). In the European Union its share was only 2.1%. It looks probable however that the popularity of electronic commerce will increase when the security of payments improves and becomes more reliable in the minds of the masses. Electronic commerce is most important in the tourism industry where online sales account for at least 5% of total sales (European Commission, 2004b).

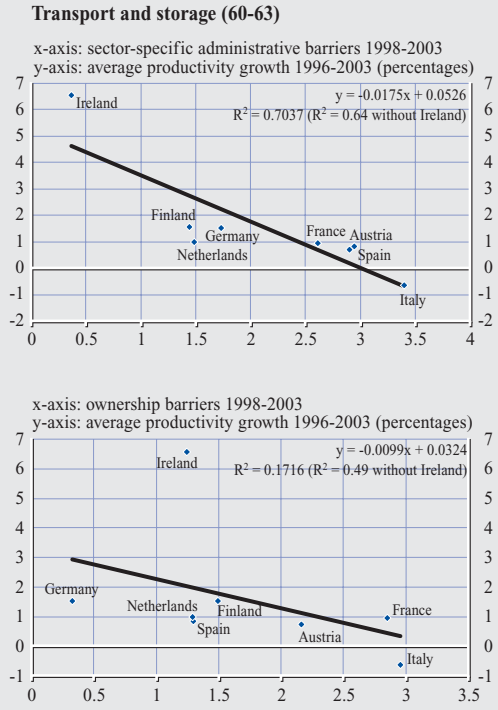
Market structure and innovation are important discussion issues in the enterprise sector. Aghion et al. (2002) show that the positive impact of competition on R&D is strongest in the levelled neck-to-neck industries characterised by an oligopolistic competition between firms. They show that innovation activity is strongest at medium levels of competition, but that both very high and very low levels of competition provide lower incentives to innovate (the so-called inverted U-shaped relationship between competition and innovation). The intuition of this result is that a sufficiently intense degree of competition increases each firm's incentive to reduce its production costs through the acquisition of a technological lead over its rival. In the services sector, this could for example be an acquisition of a new labour-saving software programme. In these models, the link between competition and innovation is ambiguous as this link is prone to be positive in neck-to-neck industries, whereas it is prone to be negative in less competitive situations where more competition may reduce innovation as monopoly rents diminish (Kilponen and Santavirta, 2004).

Chart 21 Labour productivity growth and average firm size in the wholesale and retail sector



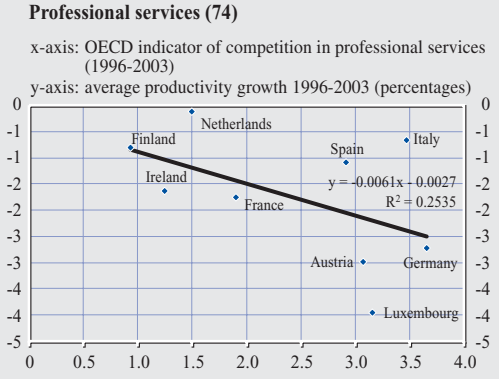
Sources: OECD STAN database, GGDC database, NCBs, European Commission and own calculations.
1) 2002 or latest available year.

Chart 22 Labour productivity growth and OECD indicators of regulation in the transport and storage sector



Sources: OECD STAN database, GGDC database, NCBs, OECD (2005e) and own calculations.
Note: A higher value indicates stricter regulation.

Chart 23 Labour productivity growth and OECD sectoral indicator of regulation for professional services



Sources: OECD STAN database, GGDC database, NCBs, OECD (2005e) and own calculations.
Note: A higher value indicates stricter regulation.

ANNEX I
PREPARATION OF THE MAIN DATABASE[64]

This annex presents the data sources and the procedures applied in this report to build the main database based on the data provided by the NCBs, the OECD STAN database and the Groningen Growth and Development Centre (GGDC) 60-Industries Database. First, it provides information about the data sources used for each country. Second, the procedures applied to construct aggregates of the variables for the euro area are presented.

I DESCRIPTION OF THE PROCEDURES APPLIED TO BUILD THE DATABASE

A summary of the primary sources used in the compilation of the database for each country is reported in Table A.1 below. In compiling the data, the following standard procedures were applied. When combining NCB data with data from the STAN and/or the GGDC database, growth rates were used to avoid level shifts.[65] To complete missing data for certain industries not available in STAN, the GGDC data were taken. When a corresponding higher-level industry aggregate was available either in STAN or provided by the NCBs, a normalisation procedure was applied to guarantee that sub-industries add up to the corresponding higher-level industry aggregates provided in the basic source. If there was a summation discrepancy, the sub-industries absorbed the residual. Each sub-sector did so in proportion to its weight in the parent industry. This normalisation procedure is the same applied by the GGDC to assure national accounts compatibility of the data. Real value added levels were computed in STAN based on volume indices calculated at 1995 prices.[66]

Data overview

Using the constructed database, the variables listed below were computed as follows:

- labour productivity per person employed = real value added/total employment;
- productivity per hour = real value added/total hours worked;
- value added deflator, growth rates = nominal value added/real value added;
- valued added shares = nominal value added of a sector/nominal value added of the total economy;
- employment shares = employment of a sector/employment of the total economy;
- number of employees over total employment = employees of a sector/employment of the same sector;
- mark-up including income of the self-employed = value added/((compensation of employees /employees)*employment));
- profit margin using net (gross) operating surplus and excluding the self-employed = net (gross) operating surplus and mixed income/[value added - (compensation of employees/employees) (employment - employees)].

The description of the other competition proxies can be found in Table 3 of Chapter 3.

The OECD indicator of sectoral regulation for sector 60 (land transport) has been aggregated using the sectoral indicator for road and rail transport using as weights the HICP weights of each component. The OECD indicator of sectoral regulation for sector 64 (post and telecommunications) has been aggregated using the sectoral indicator for post and telecommunications using as weights the HICP weights of each component.

64 Prepared by Elena Yusupová and Moreno Roma.
65 Similarly, data for Germany were extended backwards applying West German growth rates before 1991.
66 Some countries, namely Austria, France, the Netherlands, Spain, Sweden and the United States, use a chain-weighted index instead of a "fixed weight" Laspeyres index and this implied the existence of small discrepancies between the sum of the computed real value added levels from lower-level industries' and higher-level industries' aggregates.

The averages of labour productivity growth, value added price changes and the HICP (presented in Annex 4) are computed as geometric means.

2 PROCEDURES APPLIED TO CONSTRUCT INDICATORS FOR THE EURO AREA

The euro area aggregates of the variables listed above were constructed using the conventional procedures of the ECB. In particular, three types of variables can be distinguished.

First, the non-monetary variables, e.g. employment share, or share of employees in total employment, where national components of all variables are aggregated to the euro area level. For example, the employment share in a particular sector s in the euro area is computed as:

$$Empn\_share^{s}_{EA} = \frac{\sum_n Empn^{s}_{n}}{\sum_n Empn^{total}_{n}}$$

where $Empn^{s}_{n}$ is the number of people engaged in the country n in the sector s and $Empn^{total}_{n}$ is the total workforce in the country n. When adding up the national components of value added at constant prices, the components with a base year different from 1995 were rebased to that year.

Second, where the indicator consists of nominal variables, the euro area aggregates are compiled by adding up each national component, as in the first case. However, the variables in STAN before 1999 are expressed in national currencies using irrevocable exchange rates and the data do not reflect annual exchange rate changes. Therefore, before adding up national components they were converted into national currency and back into euro using annual ECU/euro exchange rates.

Third, the exchange rate movements between the national currencies and the ECU before 1999 influence the growth rate of indicators which contain nominal variables. This influence can be small when different national exchange rate movements against the ECU cancel out, but is more significant when all national exchange rate movements of euro area countries go in the same direction.

In the context of this report, the problem arises in aggregating value added deflator growth rates. Indicating the euro area growth rate of a generic nominal variable Y with

$$\frac{Y_t}{Y_{t-1}}$$

the euro area aggregates are compiled by adding up each national component after converting them into a common currency as described above. If y^n are the nominal national components for the individual country n, such a growth rate can be expressed as:

$$\frac{Y_t}{Y_{t-1}} = \frac{\sum_n y^n_t}{\sum_n y^n_{t-1}} = \sum_n \frac{y^n_t}{\sum_n y^n_{t-1}} = \sum_n \frac{y^n_{t-1} y^n_t}{y^n_{t-1} \sum_n y^n_{t-1}} =$$

$$\sum_n \frac{y^n_{t-1}}{(\sum_n y^n_{t-1})} \frac{y^n_t}{y^n_{t-1}} = \sum_n w(y^n_{t-1}) \frac{y^n_t}{y^n_{t-1}} \quad (1)$$

where

$$w(y^n_{t-1}) = \frac{y^n_{t-1}}{\sum_n y^n_{t-1}} = \frac{y^n_{t-1}}{Y_{t-1}}$$

are the weights of each element in the aggregate.

When we express (1) in the national currency, we get:

$$\sum_n w(y^n_{t-1}) \frac{\frac{y'^n_t}{p^n_t}}{\frac{y'^n_{t-1}}{p^n_{t-1}}} = \sum_n w(y^n_{t-1}) \frac{y'^n_t}{y'^n_{t-1}} \frac{p^n_{t-1}}{p^n_t} \quad (2)$$

where p is the exchange rate of the national currency to the ECU. This term also clearly shows the influence of exchange rate movements on the euro area growth rate of the nominal variables. Therefore, a method is applied which enables us to account for exchange rate effects. The equation is the following:

$$\sum_n \frac{y^n_{t-1}}{(\sum_n y^n_{t-1})} \frac{y'^n_t}{y'^n_{t-1}} \quad (3)$$

which is the weighted average of the current price growth rate compiled in national currency, using as a weight the current price indicators expressed in common currency. This formula would correspond to the normal aggregation if no exchange rate movements were observed.

The formula is equal to:

$$\sum_n \frac{y_{t-1}^n}{(\sum_n y_{t-1}^n)} \frac{y_t^n p_t^n}{y_{t-1}^n p_{t-1}^n} = \sum_n \frac{y_{t-1}^n}{(\sum_n y_{t-1}^n)} \frac{y_t^n p_t^n}{y_{t-1}^n p_{t-1}^n} \frac{(\sum_n y_t^n)}{(\sum_n y_t^n)} =$$

$$\frac{(\sum_n y_t^n)}{(\sum_n y_{t-1}^n)} \sum_n \frac{y_t^n}{(\sum_n y_t^n)} \frac{p_t^n}{p_{t-1}^n}$$

$$= \frac{Y_t}{Y_{t-1}} \sum_n \frac{y_t^n}{(\sum_n y_t^n)} \frac{p_t^n}{p_{t-1}^n} = \frac{Y_t}{Y_{t-1}} \sum_n w(y_t^n) \frac{p_t^n}{p_{t-1}^n} \quad (4)$$

The first element of this product is the growth rate compiled directly from Eurostat aggregates (see the first equation). The second element is a correction coefficient that is equal to the weighted average of the exchange rate movements, the weights being the nominal series of the period for which the growth rate is compiled. This procedure is applied to the aggregation of the national components of the value added deflator changes.

Table A.1 Overview of data sources used in the construction of the main database

	Data sent by NCBs	STAN	GGDC
Belgium	1980-2003 for most variables 1995-2003 CFC, OPS, HOURS, PROD	-	-
Germany	-	1980-2002/3 for all variables except for HOURS	1980-2002 HOURS, lower level industry aggregates during 1980-1990
Greece	1995-2003 at least at higher level industry aggregates	-	-
Spain	1980-2003 for all variables except for CFC	-	-
France	1980-2003/4 all variables at least at higher level industry aggregates	-	-
Ireland	1980-2002; EMPE, CFC, OPS, PROD are not available	-	-
Italy	1993-2003 HOURS	1980-2003 for all variables except for HOURS	1980-1991 lower level industry aggregates for VALU, VALUK, EMPN, LABR
Luxembourg [1)]	1980-1984 for all variables except for HOURS, LABR, PROD	1985-2003 for all variables except for HOURS	1980-2002 HOURS, lower level industry aggregates for VALU, VALUK, EMPN
Netherlands	1980-2003 complete at least at higher level industry aggregates	-	-
Austria	1980-2003 complete except for HOURS	-	-
Portugal	-	1980-2002/3; EMPE, OPS, CFC available only for 1987-2003	-
Finland	2002/3 – revised data	1980-2001	-
Denmark	-	1980-2003, CFC up to 2002	STAN complemented with lower level industry aggregates
Sweden [2)]	1993-2003 except for EMPE	1980-92 except for EMPE, CFC, OPS	-
United Kingdom	-	At higher level industry aggregates	STAN complemented with lower level industry aggregates
United States	-	1980-2001 at higher level industry aggregates	STAN complemented with lower level industry aggregates

1) The data for the years 1980-1984 were available only in ESA 79. They have been combined with the STAN data available since 1985 through computed growth rates.
2) The revised data since 1993 sent by the NCBs exclude the services provided by the public sector. The data on community, social and personal services (75-99) are therefore taken from the STAN database and the grand total (1-99) and total services (50-99) are recomputed.

List of abbreviations used:

VALU – Valued added at current prices
VALUK – Value added at constant prices
EMPN – Total employment (number of people engaged)
EMPE – Number of employees
HOURS – Number of total hours worked
PROD – Production (gross output) at current prices
LABR – Labour compensation of employees
CFC – Consumption of fixed capital
OPS – Operating surplus

ANNEX 2
SELECTED MEASUREMENT ISSUES[67]

1 INTRODUCTION

Recent studies[68] show that when comparing international data at the aggregate GDP level, there is some evidence of an upward effect of a few tenths of a percentage point on US labour productivity growth estimates due to statistical differences. The conclusion may be somewhat different at the level of individual industries. Furthermore, despite harmonisation in the EU, measurement differences exist amongst individual EU and euro area countries. As nominal output comparability problems appear to be limited thanks to the implementation of international standards,[69] this annex provides an overview of the comparability of labour productivity and price statistics that are relevant for the services industries, focusing on selected market services, non-market services in the national accounts, price statistics from the HICP, quality adjustment issues, index numbers and labour input. While the focus is on a qualitative description of the statistical issues, quantitative estimates published in recent research are sometimes quoted. However, these are very tentative and are meant to show the potential size of the effect rather than a precise estimate.

2 SCOPE AND LIMITS OF SOURCE STATISTICS

While all countries compared produce a common set of national accounts data, including a breakdown by industry, the availability of source statistics for compiling the accounts varies. In particular in the services sector there is a considerable dearth of source statistics. The main issues, some of which are discussed further below, are:

– With regard to the measurement of nominal turnover and output, there are gaps in the source statistics, in particular for all quarterly data, while annual sources are more complete. EU countries and the US are developing quarterly services statistics that will improve the situation.

– As regards price statistics, CPI statistics for deflating consumer services are fully available and are generally of high quality. However, price statistics for measuring business-to-business services are very incomplete and their systematic development in the EU and US is at an early stage. Data sources for deflating the value added of all "margin" industries (e.g. trade) are scarce.

– Source statistics for volume measures in government services are often inadequate, and work towards improvements has progressed at a different pace. This is a key reason why the coverage of non-market services in this report is limited (see Box 4).

– Concerning labour market measures, the source statistics for measuring employment – albeit not always fully comparable – are generally complete. Statistics for hours worked, however, are for many countries incomplete, in particular for the services sector. Labour Force Survey results, some register data and modelling are the main sources for national accountants to compile estimates for hours worked in the services sector. Given the incomplete data, statistics for hours worked are only partially used in this report.

3 MARKET SERVICES, IN PARTICULAR WHOLESALE AND RETAIL TRADE

Measuring output volume and labour productivity change requires that changes in

67 Prepared by Wim Haine with input from David Cornille.
68 See in particular OECD (2003a) and OECD (2004b).
69 Within Europe the ESA 95 (Council Regulation (EC) No 2223/96), the STS (Council Regulation (EC) No 1165/98) and the HICP (Council Regulation (EC) No 2494/95) regulations aim to set measurement standards, and internationally the SNA 93 and the IMF (CPI and PPI) put forward similar recommendations.

current price values of goods and services are broken down into volume and price components. Typically, this is more difficult for services than for goods. First, as mentioned, there is a relative dearth of primary statistics for these services. Second, it is often conceptually more difficult to adjust services for changes in quality, which is needed to distinguish between price and volume changes of a particular service provided. As the share of services in GDP has increased over time, but not to the same extent in all countries, the potential for measurement errors and for insufficient comparability of economic growth rate estimates has increased as well. However, relative to the size of the services sector in the economy (market and non-market services account for 71% of the euro area economy and 77% of the US economy), simulations show a relatively modest potential effect on annual real GDP growth (0.1-0.3 p.p. for the US and the euro area).[70]

The measurement of retail and wholesale trade industries warrants some further consideration, given that they are among the largest services industries with output and productivity growth rates that are higher in the US than in the euro area. A recent study[71] concluded that output volume growth in US distributive trade industries may be somewhat overstated, but that even after correcting for this effect, US output and productivity growth rates are still well above those in the euro area. The upward effect on US distributive trade industries output volume growth is due to the greater use of hedonics in the US and a higher share of ICT goods sales than in the euro area. By excluding the high contributions of ICT-related trade, one arrives at upper bound estimates for the potential effect of this measurement issue on value added volume growth: 1.2% (out of 6.7%) for retailing and 2.3% (out of 6.6%) for wholesaling in the period 1995-2002.

Furthermore, it should be noted that the current statistical practice of using sales volume growth in distributive trade as a proxy for output volume growth is becoming increasingly questionable. The reason is that quality changes in the products themselves cannot be distinguished from quality changes in the distributive services that deliver the products to the user.

4 FINANCIAL SERVICES[72]

While countries do not differ much in their approach to measuring the nominal output of the financial services industry, differences exist as regards the choice of deflation methodology. In the US, a quantity indicator for the volume changes of implicitly-priced banking services (financial intermediation services indirectly measured, FISIM) is used that traces volumes of banking transactions (e.g. the number of transactions on automated teller machines) to better capture the growing volume of transactions. In other countries, such an output-based volume indicator does not exist (or is not yet incorporated in the database used in this report) and the value of financial services in volume terms is derived by applying base-period interest margins to the inflation-adjusted stock of assets and liabilities. However, these different deflation methodologies do not explain labour productivity growth differences across countries, as productivity growth differences among European countries are at least as large as between the European countries and the US. For a discussion of financial services, see Box 3.

5 NON-MARKET SERVICES

Measuring volume and productivity change of non-market services is not straightforward. The main problem is to specify appropriate measures in order to deflate the government output value, which itself is often estimated as the sum of input costs (labour costs, intermediate consumption and capital consumption). Labour costs, which account for the majority of total costs, are usually deflated using some form of

70 OECD (2003b).
71 See Timmer et al. (2004).
72 OECD (2003a).

average wage index. Deriving the volume change of government output by deflating all the inputs inevitably assumes that the total factor productivity change in the production of government services is equal to zero, and the same then applies to labour productivity change. This assumption is implausible. To produce more accurate productivity change estimates, Member States must comply with EU legislation by 2006 and measure the volume change of government output directly, at least for health and education services. Some EU countries (e.g. Germany, France, Italy, the Netherlands and the UK[73]) have already implemented direct output growth measures, while others (e.g. Austria and Finland) are planning to do so by end-2005.

However, for government services other than health and education, almost all countries continue to use a method based on the deflation of inputs. This is because the basic information required for output volume change measurement – output quantity and quality change – is mostly lacking. Moreover, even when output-based estimates can be developed, comparability will not always improve since there is a considerable judgemental element in defining government output volume change, and output-based deflation measures are implemented in the EU, but not in the US which will continue using input-based methods (see also Box 4).

6 ADJUSTING FOR QUALITY CHANGES AND HEDONIC METHODS

Quality adjustment and in particular the fact that the application of different methodologies in the US and European countries produces different results is a widely discussed issue. It should, however, be noted that these differences are mostly relevant for (high-technology) ICT goods and not so much for services, unless these ICT deflators are a component of the services deflator (see section on wholesale and retail trade above). The sometimes striking differences for ICT products' deflators are a result of the more widespread use of hedonic methods (i.e. a deflation technique based on a regression of the prices of a basket of goods on a set of qualities or characteristics of those goods) in the US (about 22% of US GDP) compared with European countries (about 0.5% of euro area GDP). In Europe, Germany,[74] France, the Netherlands and Finland have introduced hedonic adjustments in national accounts deflators, mainly for ICT goods and dwellings. As far as services are concerned, hedonic methods are only used in the US for rents (including imputed rents for owner-occupied housing), accounting for about 10% of US GDP. However, the differences between various quality adjustment methods for rents are usually relatively small. In Europe, Finland is the only country using hedonic methods for rents. At the aggregate GDP level, the more widespread use of hedonic deflators in the US – for both goods and services – has an estimated upward effect on GDP volume growth of 0.1-0.2 percentage point per year.[75]

7 CHOICE OF INDEX NUMBERS FOR AGGREGATION

The way in which price and volume changes are aggregated is determined by the choice of the index number formula. Different formulae exist, using different relative price structures. In order to measure the volume growth of GDP and its components, the effect of price changes has to be eliminated (i.e. prices have to be kept constant). For this purpose, most EU countries have traditionally used a weighting structure which is updated every five years. By end-2005 most Member States will – in line with EU regulations – use weights that are updated annually, using values at the previous year's prices, and the results are subsequently chain-linked.

The introduction of chain-linking by all EU countries will improve the accuracy of volume

73 See also Bank of England (2005).
74 See also Deutsche Bundesbank (2005).
75 ECB calculations based on the GGDC 60-Industries Database. See also Schreyer (2002) and Colecchia and Schreyer (2002).

growth measures. If fixed weights are used for a prolonged period, these weights become increasingly less representative (e.g. the 1995 investment share of computers is out of date when computing the volume growth of fixed capital formation in 2004). The effect on volume growth depends on the size and sign of relative price changes and the reaction of consumers and producers to these. Recent experience in EU Member States has shown that the use of changing weights results in revisions to real GDP growth rates up to approximately 0.2 percentage point. The impact is likely to be more pronounced for individual components or industries.

Chain-linking improves the comparability with the US,[76] which has used a similar practice since the late 1990s. It also improves the comparability within the EU, since several EU countries already use chain-linking (France, the Netherlands, Greece, Portugal, Luxembourg and the United Kingdom). In the context of the ongoing major benchmark revisions, Germany, Spain and Ireland have recently introduced chain-linked volume measures.

8 HARMONISED INDEX OF CONSUMER PRICES (HICP)

The HICP services component, which in 2005 accounted for 41% of the euro area HICP, can be broken down into five services groups: communication services, housing services (not including imputed rents for owner-occupied housing), recreation and personal services (including hotels and restaurants, package holidays, etc.), transportation services and miscellaneous services. Additional details within these components are also available on a monthly basis since 1995. The euro area HICP is the result of the aggregation of the national HICPs. CPI and HICP data are also intensively used for national accounts deflation purposes. EU country HICP data follow harmonisation regulations which have been adopted and implemented since 1995. In addition to the general HICP rules (e.g. on coverage, weights and prices), a number of measures have been taken that are particularly relevant for the comparability of services inflation in the HICP:

- harmonised geographical and population coverage in the year 2000; this led to the coverage of expenditure of foreign tourists in national HICPs and had an impact in particular on the weights for hotels, restaurants and package holiday services;
- harmonised coverage of health, education and social protection services in 2000 and 2001; prices covered reflect prices paid by consumers, net of reimbursement by social insurance, and including flat fees (e.g. for medicine prescriptions);
- harmonised measurement of tariff prices for the HICP (e.g. for fixed-line telephone tariffs) from 1999;
- harmonised measurement of private insurance prices and weights from 1999;
- harmonised measurement of financial services prices from 2002; and
- harmonised practices for the timing of entering services price changes to the HICP from 2001.

Despite the substantial harmonisation efforts undertaken, there are measurement challenges for HICP services prices (and often for national CPI worldwide), of which the most important are:

76 US Bureau of Economic Analysis simulations have shown that GDP volume growth rates in a chain-linked system, when compared with those in a fixed-base system, were on average 0.4 percentage point per annum lower in the period 1995-2002. The reasons for the smaller size of downward revisions in the euro area than in the US are in particular the following: (a) industries with fast-growing volumes but even faster-falling prices (e.g. ICT) have a stronger influence on GDP growth in the US; (b) the US uses more hedonic price indices which typically lead to a more pronounced decrease in certain prices and consequently also to more pronounced changes in the relative price structure.

– price measurement is difficult for some services because of rapid changes in the number of suppliers (for example, telecommunications which have been changing quickly since the liberalisation process began in the course of the 1990s, from a situation with one provider to a situation with multiple providers with differentiated products, and many different tariff structures);

– price measurement is difficult in view of ongoing product innovation and quality change; this could be particularly relevant for services characterised by strong technological innovation, e.g. communication and medical services; price measurement is also difficult when quality changes are difficult to identify and quantify (e.g. education);

– the distinction between prices of goods and prices of services is difficult when these are offered as bundles, as is the case for mobile phone offers;

– the incidence of administered prices can be substantial, and the extent varies over time and across countries (e.g. health services), depending on institutional arrangements; and

– furthermore, it should be noted that due to the step-wise introduction of HICP harmonisation, HICPs tend to be more comparable for periods after 1999-2000 than they are for the years before.[77]

9 LABOUR INPUT

Another important issue for labour productivity relates to the measurement of labour input.[78] Labour input measures include numbers of persons employed, hours worked, the number of full-time equivalents and the number of jobs. The two main measures traditionally used in labour productivity calculations are the number of persons employed and hours worked.[79] The latter is the preferred measure for productivity analysis as it reflects the actual volume of work, which is important due to the emergence of part-time work and the decline of the average full-time working week in many countries. However, hours worked are more difficult to measure and these data are not yet available for a number of EU countries from national accounts sources. The issue of part-time work is particularly relevant for the services parts of the economy. The table shows the relative shares of part-time work in selected parts of the economy and shows that part-time work tends to be more prevalent in the services sector.

Table A.2 Shares of part-time work in selected parts of the euro area economy

(percentages; fourth quarter of 2003)

NACE Section	Share of total number of persons employed
Manufacturing (NACE Rev 1. D)	9.1
Construction (F)	2.4
Wholesale and retail trade; repair of motor vehicles, motorcycles, etc. (G)	17.2
Real estate, renting and business activities (K)	10.9
Health and social work (N)	18.5

Source: 2003 Eurostat Labour Force Survey.

77 It may also be mentioned that "water supply (cp0441)" was included in the services component until December 1999, after which it was decided to record water supply in the non-energy industrial goods component. Although the services component has been revised to take this into account, it has not always been possible to identify "water supply" from the aggregate series "water supply and miscellaneous services relating to the dwelling (cp044)", because of a lack of detailed data.

78 See Bruyère and Chagny (2002).

79 While definitions for both of these variables are available in the ESA 95 Regulation, the national data currently available are not always fully in line with these (jobs data rather than headcount data are reported, etc.). Work is ongoing to improve this harmonisation aspect.

ANNEX 3
COMPLETE LITERATURE REVIEW[80]

This annex provides an overview of the recent theoretical and empirical literature, which investigates the impact of competition on productivity and prices in the services sector. We proceed as follows. First, we review the research on services sector productivity growth and its main drivers. Second, we provide an overview of studies which concentrate on clarifying causalities between proxies of competition and price developments in individual services sectors. Finally, we present the studies concerned with measurement issues in calculating services output, productivity indicators and the construction of competition proxies.

1 SERVICES SECTOR PRODUCTIVITY AND ITS MAIN DRIVERS

Empirical research shows a productivity growth decline in services in the euro area accompanied by a positive gap in productivity growth between manufacturing and services and between the services sectors in the US and in Europe. The decline in several EU countries accelerated in the 1990s. In addition, productivity growth developments are substantially more heterogeneous across services industries than across manufacturing industries.

Wolff (1999) studies the services sectors during the period 1958-1987 in the US and documents a productivity growth slowdown. Diewert and Fox (1999) conclude that measurement errors can explain a part of the gradual decline in productivity growth, but cannot account for its sudden and simultaneous downturn in virtually all OECD countries. The investigation of productivity growth in the OECD countries over the last two decades by Scarpetta et al. (2000) suggests that the overall contribution of market services to labour productivity growth remains limited in many countries. Baily and Solow (2001) found a wide gap in services sector productivity levels between Germany and the US. The analysis of the contribution of individual firms to the labour productivity growth of each sector performed by Scarpetta et al. (2002) for the time interval between the mid-1980s and mid-1990s gave far more varied results for the services sector than for the manufacturing sector.

In general, productivity growth differences between manufacturing and services can arguably flow from the following three sources discussed below.

First, services are characterised by lower capital intensity and technological diffusion. Technology is transferred more quickly in manufacturing industries than in the services sector, partly because much of the relevant technology is embodied in tradable goods. Wölfl (2005) sees high labour intensity of services sectors as one of the factors hampering productivity growth. However, Pilat (1996) found that availability of technology explained the productivity growth differences in some sectors only to a limited degree. Similarly, van Ark et al. (1999) argue that capital intensity explains a part of the productivity gap in the services sector in France, but not in Germany where the level of capital intensity is higher relative to the US.

Second, a lower rate of innovation and use of information and communication technology (ICT) might contribute to a lower productivity growth in the services sector. There are two strands of literature concerning this factor: in the first one, researchers agree with a positive impact of information technology and innovation on services sector productivity and its rate of growth, and in the second one researchers are more sceptical about the real impact of communication technology on productivity in the services sector.

Scarpetta et al. (2000), investigating OECD countries in the period 1980-2000, argue that

80 Prepared by Elena Yusupová.

technological changes have enabled significant improvements in productivity. Gordon (2004) concluded that a faster arrival of ICT in the services sector partially explained productivity growth differences between the US and Europe. These results are in line with the argument of the European Commission (2005a) that different extents of ICT and R&D in the services sector are driving forces of the productivity gap between the EU and the US. Nicoletti and Scarpetta (2003) compare the sectoral productivity growth structure between the EU and the US and find that whereas the drivers of services productivity growth in the US were mainly industries with low skill content, in Europe productivity growth was largely driven by high skill content services.

Annenkov and Madaschi (2005) also attribute faster-growing labour productivity in the Nordic countries than in the euro area to the ICT-using services sectors in the period 1995-2002. They conclude that the lower labour productivity growth in the euro area is caused by its lower capacity to diffuse ICT products.

On the other hand, van Ark et al. (1999), examining productivity performance in services for five OECD countries in the 1990s, did not find the level of innovation to be a good explanatory factor of productivity gaps as none of the countries had a clear-cut innovation advantage in the investigated services industries. Wolff (1999) also concludes that computerisation does not appear to exert a positive effect on productivity growth. He argues that technology restructuring is closely linked with changes in the occupational composition of employment which seem to have delayed productivity growth.

Third, services are less traded internationally and so competitive pressures are weaker in these industries. This factor is very important as it affects the services sectors directly and also indirectly through its impact on innovations and market structures (European Commission, 2005a).

Though the theoretical literature provides arguments that increased competition, as a result of proceeding liberalisation, can have negative effects on efficiency (Aghion et al., 2002, and Etro, 2004), the overall consensus among researchers is that benefits of competition outweigh its potential costs as it boosts productivity and reduces labour market rigidities (e.g. Faini et al., 2004, Nicoletti and Scarpetta, 2003).

Pilat (1996) examines the OECD countries in the period 1987-1993 and argues that some proxies of competition (e.g. entry rate, openness and import penetration) partly account for variation of productivity levels and productivity gaps between Europe and the US. However, sector concentration is insignificant.

Baily and Zitzewitz (2000) present case studies of five services industries (retail banking, telecommunications, public transport, retail trade and airlines) and confirm that increased competition improves productivity levels but it can have ambiguous effects on the level of innovation.

Scarpetta et al. (2002) examine the impact of regulation on firm performance in OECD countries and come to the conclusion that strict regulation affects primarily the entry of new small firms. The link with productivity is however less clear-cut. This finding is in line with McGuckin et al. (2005) who argue that some regulations can even increase productivity.

Nicoletti and Scarpetta (2003) find a positive impact of entry on total factor productivity growth, especially in services. A positive impact of entry liberalisation is also the result of the study by Copenhagen Economics (2005), which shows that the freedom of establishment for service providers and the free movement of services between the EU Member States would raise GDP and employment in the long run by 0.6% and 0.3% respectively. In addition, the European Commission (2005b) points out that the most important gains of entry liberalisation

would mostly occur in the services sectors. Gordon (2004) also explains part of the differing transatlantic evolution of productivity growth by the level of competition.

Faini et al. (2004) focus on the services sector as a provider of intermediate inputs for manufacturing in Germany, Italy and the UK and find that regulation in services can have negative effects as it discourages inflows of FDI. Their key finding is that deregulation is associated with faster productivity growth and competitiveness both in the services sector and in the rest of the economy.

The European Central Bank (2004b) reviews the trends in aggregate labour productivity growth in the euro area since the early 1980s and explains them in terms of underlying sectoral developments. The decline in services sector productivity between the 1980s and the 1990s was not homogeneous across services industries. While productivity slightly increased in trade and transport, it declined in financial and professional services. Productivity developments usually reflected output developments, which indicate the importance of economies of scale in many services industries.

Following this overview of productivity growth developments in the services sector, we now focus on some specific services industries which have been more extensively studied in the empirical literature.

RETAIL SECTOR

The retail sector is an important part of the services sector where employment and economic activity are increasingly concentrated in terms of market structure (Baily and Solow, 2001). This sector has been a force driving productivity in the US, while its productivity growth decreased in Europe in the last decade.

According to the results of Baily (1993), regulation of retail trade plays a major role in explaining the productivity shortfall in Europe relative to the UK. Baily and Solow (2001) found a similar result for some OECD countries during the 1990s.

Van Ark et al. (1999) found that the productivity differences among five OECD countries were more significant in retail than in wholesale. However, they attributed the advance of the US in retail to economies of scale.

Boylaud (2000) found an overall positive impact of easing the opening hours and store size regulation on the sector's performance and efficiency in OECD countries. McGuckin et al. (2005) showed an acceleration of productivity growth only in the United Kingdom and Luxembourg in retail and in Finland and the Netherlands in wholesale. They consider the regulations constraining competition, which are much stricter in Europe than in the US, to be one of the main reasons for productivity growth differences.

TELECOMMUNICATIONS AND POSTAL SERVICES

Boylaud and Nicoletti (2000) examine the effects of liberalisation and privatisation in telecommunications, taking into account the regulatory regimes across 23 OECD countries from 1991 to 1997. They find a significant positive correlation between liberalisation in telecommunications and labour productivity growth.

Van der Lijn et al. (2004) show that while entry liberalisation is found to have a positive effect on productivity growth in the telecommunication sector, no effect is found in the postal and energy sectors. This finding supports the idea that economies of scale might matter in services industries with homogeneous products.

TRANSPORT

Regarding road transport, productivity growth was found to be higher in European countries than in the US by Van Ark et al. (1999), who explain this by the different character of the services mix between the EU and the US, as in the US people mostly use private transport for intercity distances. The productivity in air transport was generally relatively high in

Europe. One of the reasons is that air transport is exposed to international competition and fully liberalised, which brings intensive price competition. On the other hand, rail transport is in the earlier stages of the regulatory reform process (Martin et al., 2005).

Boylaud (2000) found a positive impact of regulatory reforms in road distribution on the entry rate in OECD countries during the period 1975-2000. Moreover, prices went down and service quality up.

PROFESSIONAL SERVICES

Not much systematic research has been done in the area of professional services. IBFD (2001) is a good source of information on accounting and legal professions. Henssler and Nerlich (1994) also offer studies on legal services in different countries. Legal, accountancy and technical professional services have been analysed in Felderer et al. (1998, 1999). However, these studies are rather descriptive, service quality is considered to be equal across countries and analytical studies looking at causal links between the regulatory framework, service productivity and price developments are relatively rare.

Wolff (1999) explains low productivity levels of professional services by the fact that the activities in which professional workers are involved are inherently rent-seeking and do not increase measured output. Moreover, professional workers provide heterogeneous services which are harder to measure.

More recently, Paterson et al. (2003) presented an extensive comparison of the legislation, regulation and codes of practice for a range of professional services across EU Member States and identified the economic effects of different degrees of regulation. The approach is comparative and based on surveys. They find a negative correlation between the degree of regulation and productivity for legal, accounting and technical services. Since neither technological differences nor employment levels are the decisive source of higher productivity, this correlation tends to suggest a shortfall in potential output among highly regulated countries.

FINANCIAL SERVICES

In contrast to other services reviewed above, financial services are substantially more exposed to international competition and the use of ICT. The liberalisation process of this sector started in the EU countries earlier than regulatory reforms in other services. As a result, it had to deal with the market pressure from competing capital markets and foreign financial institutions on the one hand and with the regulatory pressures of government agencies on the other hand.

In the OECD countries, between 40% and 60% of financial services output is made up of inputs for intermediate demand (Wölfl, 2003). Regarding the potential impact of financial services liberalisation, Verikios and Zhang (2000) estimated the price decrease in the banking sector in Europe at 5%.

Wölfl (2005) came to the conclusion that financial intermediation in OECD countries was characterised by positive productivity growth which amounts to an average level of about 4.5% during the period 1980-2000.

O'Mahony and van Ark (2003) also argue that financial services are one of the few sectors where the EU showed significant productivity gains in the second half of the 1990s. However, the position in the financial services sector varies across euro area countries: while Spain, France and Ireland improved their performance in the late 1990s, other countries showed disappointing results. The authors also argue that there is a small, but significant contribution to the US growth advantage over the euro area from general financial services.

Regarding the US-EU productivity growth differential, Inklaar et al. (2003) show that productivity growth in financial services in the US in the late 1990s is not matched by similar developments in the European countries. In this

respect, the European Commission (2005b) points out that financial services were one of the main drivers of the US acceleration in labour productivity during the period 1996-2000 caused in particular by a higher level of ICT capital deepening.

Finally, as Wölfl (2005) and Fixler and Zieschang (1999) extensively discuss, low productivity indicators and low or even negative productivity growth are largely due to measurement problems in calculating output and value added. Pilat et al. (2002) identified possible channels of mis-measurement in this sector.

2 THE IMPACT OF COMPETITION ON PRICE DEVELOPMENTS IN THE SERVICES SECTOR

Empirical studies conducted within the Eurosystem Inflation Persistence Network[81] (IPN) initiated by the ECB have focused on sector-specific price developments and the pattern of price-setting behaviour in the euro area services sector.

Lünnemann and Mathä (2005), focusing on EU countries, show that services HICP sub-indices exhibit a higher average inflation rate and larger degree of nominal price rigidities (mainly nominal downward price rigidity) than non-services. Services price index changes are less frequent but larger compared with manufacturing goods characterised by larger asymmetries between price index increases and decreases. The key result is that for most of the EU15 countries, as well as for the EU15 and euro area aggregates, excluding services from the HICP would result in a reduction in the degree of inflation persistence.

There are also several country studies carried out within the IPN framework. Aucremanne and Dhyne (2004) investigate the frequency of price changes, their size and direction using Belgian CPI data during the period 1989-2001. Dias et al. (2004) use Portuguese data for the period 1992-2001 and Baumgartner et al. (2005) Austrian micro CPI data for a similar type of analysis. Their results generally coincide with those of Lünnemann and Mathä (2005). Baudry et al. (2004) and Bilke (2005) measure inflation persistence using French CPI data and show that the aggregate inflation persistence is above the average persistence of its sectoral components. However, Bilke (2005) did not find any systematic difference between traded and non-traded goods.

Angeloni et al. (2005) and Dhyne et al. (2005) provide a useful summary of the main findings of the IPN in the euro area. Generally, compared with the manufacturing and energy sectors, price changes in services are less frequent, which implies that prices in the services sector are substantially stickier. The reasons are not obvious. According to the price-setting surveys, the most important factors preventing price adjustments are: (i) long-run relationships with customers; (ii) explicit contracts that are costly to renegotiate; and (iii) a low level of competition. A higher degree of price stickiness consequently reduces the impact of cost-push shocks on inflation.

There is also substantial heterogeneity of price-setting behaviour across sectors, which might be driven by the variability of input costs. In particular, the larger share of labour input relative to intermediate goods and downward nominal wage rigidities might explain price stickiness in labour-intensive services sectors. The results are relatively homogeneous across countries, except for Finland and Portugal (Dhyne et al., 2005).

Finally, based on the IPN's findings, while price decreases are not uncommon in the euro area, the services sector seems to be a notable exception (on average around 40% of price changes are price reductions; in the services sector this stands at 20% and price changes are on average larger).

81 Several papers dealing with inflation persistence and presenting research within the IPN can be found under http://www.ecb.int/pub/html/index.en.html.

These results pose the question as to how the level of competition affects services price dynamics and their flexibility.

Cavelaars (2005) justifies theoretically causalities between the level of competition and price developments and describes possible channels through which these effects take place. He highlights four channels through which enhanced competition in the services non-tradable sector affects prices and evaluates their relative importance: (i) directly via downward pressure on profit margins; (ii) directly via an improvement in the terms of trade; (iii) indirectly through a short-run accumulation of net foreign assets; and (iv) indirectly through upward pressure on the wage rate reflecting the productivity growth. He concludes that for realistic parameter values, an increase in the degree of competition in the services sector reduces the general price level in the domestic economy.

Turning now to the empirical evidence, several papers concentrate on identifying the sector-specific factors of price levels and inflation dynamics. Neiss (2001) focuses on the relationship between competition among firms and inflation in the period 1973-1988 in OECD countries. She finds a positive impact of the mark-up on inflation, which is eliminated with the inclusion of GDP per capita as these two variables are correlated. This indicates that economic fundamentals more than institutional arrangements play a role in determining average inflation. Cavelaars (2003), in contrast to Neiss (2001), looks also at the OECD index for economic regulation and at central bank independence and uses more recent data. He finds the mark-up to be an important factor in explaining inflation differentials across OECD countries. Repeating the analysis for the EU countries, the positive impact of the mark-up on inflation is even stronger. Following a similar approach, Przybyla and Roma (2005) study the impact of product market competition on inflation using the level of the mark-up, the profit margin, the profit rate and survey-based "intensity of competition" variables as proxies of competition and controlling for country-specific characteristics. They conclude that a higher level of product market competition reduces average inflation for a prolonged period of time. However, the bulk of variation in sectoral inflation rates is driven by country-specific effects.

The theoretical results of Cavelaars (2005) are supported by a study conducted by Copenhagen Economics (2005) linking the effects of an integrated market for services to economy-wide effects. In particular, stronger competition is expected to reduce high profit margins and increased efficiency in the utilisation of resources reduces costs of service provision.

Betancourt and Gautschi (1993) developed an economic framework for the empirical analysis of retail margins for 49 retail indices in the US. They isolate economy-specific profit, controlling for firm- and product-specific factors, and find a significantly negative effect of the trade restrictiveness index on profit margins.

Kalirajan (2000) studies the impact of cost-creating vs. rent-creating legislative restrictions on the price level in the retail and wholesale distribution services in 38 countries. He concludes that the cost-creating effect prevails, while the level of competition (e.g. market structure), character of the service (e.g. extent of product differentiation) and price elasticity also affect the extent to which the rent-creating effect can be appropriated by producers or the cost-creating effect can be passed on to consumers. One should therefore control for these variables to determine correctly the impact of regulations on prices and inflation.

Boylaud and Nicoletti (2000) find empirical evidence that the level of competition in telecommunications and air transport is negatively related to consumer prices and that it is mainly the presence of market power, measured by the market share, which affects the market. Blöndal and Pilat (1997) have documented the price benefits of opening the

airline industries. Martin et al. (2005) show that regulatory reform had a substantial downward impact on prices in telecommunications, energy and transport.

However, Faini et al. (2004) claim that the downward impact of liberalisation on prices is rather controversial. In industries less exposed to product and process innovation and exposed to little competitive pressures where a natural monopoly holds or the tradability of the sector is largely limited, the price effect might be negligible even after the implementation of regulatory reforms. This is in line with the argument of the OECD (1997), which points out that in some services, such as telecommunications, the price decline due to technological progress can be difficult to distinguish from an impact of regulatory reform.

The European Central Bank (2002b) documents a larger price level dispersion of non-tradable goods across the euro area relative to tradables. Among other factors, lower exposure to cross-country competition was considered to be a key factor behind this difference. Recently, price level data have been analysed by Faber and Stokman (2005) to assess price level convergence from a macro perspective. They constructed price level data rescaling the HICP indices using absolute price levels computed by Eurostat in 1999 and they classified the product categories into tradable and non-tradable. The authors found that price level convergence is widespread since the 1960s and particularly strong in the early 1990s. Price dispersion rates in the euro area are however found to be structurally higher than in the US. Tradable products generally show lower dispersion rates and faster convergence than non-tradable services (housing, recreation and culture and most of transportation and communications).

The profit development analyses of the European Central Bank (2004a) underline relatively stable aggregate profit margins for the whole economy, which mask heterogeneous developments across sectors. Overall profit margins are higher and they vary much more across countries in non-manufacturing industries. The authors argue that intense competition increases efficiency and exerts downward pressure on costs and prices.

The findings of the recent literature lead to the conclusion that competition is a key factor explaining productivity and price developments in the services sector.

3 MEASUREMENT ISSUES IN THE SERVICES SECTOR

In the literature on productivity and price developments in the services sector, authors often stress the existence of various measurement issues which may bias computed indicators.[82]

The first problem arises with measuring output in services industries (see also Annex 2). Diewert and Fox (1999) and Triplett (1999) explain how technological improvements reducing margins and selling prices bias both nominal and real output downwards. Biased measurement of output is reflected in an imprecise measure of productivity. Scarpetta et al. (2000) point out that technological change has enabled significant improvements in productivity which are not always reflected in productivity statistics. Wölfl (2005) also attributes weak or negative productivity growth in the services sector to measurement error which increases with the proportion of self-employed as providers of intermediate input. In a related paper Wölfl (2003) justifies this argument by saying that service providers are increasingly becoming providers of intermediate goods for industry and that they are therefore more exposed to competitive pressures and in case of permanent low or negative productivity growth they could not survive in the markets.

Wolff (1999) argues that one can avoid problems with productivity measurement using indirect indicators of productivity growth in the services

82 For an overview of the main activities undertaken in international organisations and national statistical offices to improve measurement of services, see Giovannini and Cave (2005).

sector, such as changes in the occupational composition of employment within the services sectors. However, as these indicators are often difficult to obtain, Baily and Zitzewitz (2000) assert that in industries where the ratio of purchased inputs to output is large and may differ across countries, it is appropriate to use value added in productivity calculations.

Regarding the measurement of competition, one can observe a divergence between the theoretical and the empirical approach concerning this issue. The theoretical literature has parameterised competition as a reduction of barriers to entry, which means lower fixed costs and an increase in the number of firms (Martin, 1993); however, higher competition leads to price competition and the switch from Cournot to Bertrand competition consequently eliminates less efficient firms and reduces their number (Aghion et al., 1995, or Hay and Liu, 1997). As a rise in competition can theoretically increase or decrease the number of firms with an ambiguous effect on firm profitability (Boone, 2000 and 2004), the entry rates and firm concentration might not precisely account for the level of competition. The empirical literature uses different proxies of competition such as industry concentration, entry rates, price-cost margins and mark-ups, which are not without problems.

First, the use of profit margins and mark-ups does not separate differences in capital and labour costs, and they are also not able to capture quality improvements (Baily and Solow, 2001). Due to the different extent of technological and quality improvements, these indicators are exposed to substantial measurement errors.

Second, the use of market structure indicators as proxies of competition is complicated by their endogenous character. As Boylaud (2000) argues, the differences in regulatory approaches themselves shape industry structures and thus affect competitive developments across OECD countries. The character of the industry is also relevant for the market structure, where services industries with more homogeneous products are characterised by a higher level of competition. This indicates that market structure and productivity growth are determined together by the regulatory framework and the nature of the industry. To this end, Pilat (1996) asserts that the relationship between productivity and market structure indicators, such as concentration, entry rates, export intensity and tariff barriers, is significant only in industries with homogeneous products.

Boone (2000) uses firm-level data and shows that competition raised the profits of more efficient firms relative to the profits of less efficient firms (so-called *reallocation effect*). However, in absolute terms this is not necessarily a monotone process. In his next study, Boone (2004) introduces a new measure – relative profit difference – which is monotone in competition. The disadvantage of this approach is that it requires firm-level data and detailed information on the firm's conduct.

As for the measurement of inflation and price developments, Nakamura (1999) casts doubt on standard methods of measuring inflation in the retail sector, which is largely exposed to information technology, computerisation of retailing, and increases in product/service variety, and characterised by price dispersion, as these factors weaken the case for the standard method of measuring inflation. He justifies his argument by showing the divergence of two retail price indices in the US.

Table A.3 Overview of selected empirical studies on productivity in services sectors and its main determinants

Author(s)	Country, period	Methods	Dependent variable	Explanatory variable	Impact/ Main findings
Annenkov and Madaschi (2005)	Nordic EU countries (euro area as benchmark), 1980-2004	Descriptive analysis	Main finding: Positive impact of ICT-using sector on productivity and economic growth		
Baily and Zitzewitz (2000)	Selected OECD countries, 1990s, banking, telecom, (air) transport, retail	Case studies, descriptive analyses	Productivity	Competition	Positive
Baily and Solow (2001)	Selected OECD countries, 1990s, retail sector	Case studies, descriptive analyses	Labour productivity	Competition Legislative restrictions	Positive Negative
Boylaud (2000)	OECD countries, 1975-2000, retail and road distribution	Descriptive	Entry rate Prices Service quality	Regulatory reforms	Positive Negative Positive
ECB (2004b)	Euro area, 1980-2003	Descriptive analysis	Labour productivity	Output Productivity in ICT-using and producing sectors	Positive Positive
European Commission (2005b)	EU and US	Literature survey	Economic effect of services sector liberalisation	Regulatory reforms	Gains mostly in services sectors
Faini et al. (2004)	DE, IT, UK	Descriptive analysis, overview of regulations	Productivity growth	Entry liberalisation Deregulation FDI inflow	Positive Positive Positive
Gordon (2004)	US, Europe, 1990-2003	Descriptive analysis	Productivity	Competition Corporatism and cult. differences	Positive Negative
McGuckin et al. (2005)	Selected OECD countries, 1996-2002, retail	Descriptive and comparative analysis	Productivity growth	Regulatory restrictions	Ambiguous, mostly negative
Nicoletti and Scarpetta (2003)	OECD countries, 1984-1998	Econometric analysis	MFP	Innovation Regulation Privatisation	Positive Ambiguous Positive
Pilat (1996)	OECD countries, 1987-1993	Econometric analysis	Productivity gap between US and EU	Capital intensity Concentration Entry rate Openness Import penetration	Positive Insignificant Positive Positive Positive
Scarpetta et al. (2000)	OECD countries, 1980-2000	Descriptive analysis	Services sector contribution to GDP growth	Technological change Structural shifts	Positive Ambiguous
Scarpetta et al. (2002)	OECD countries, 1985-1994	Econometric analysis (using firm-level data)	MFP Entry rates	Product market restrictions MFP of leader Firm size	Negative Non-linear Positive (U-shaped)
Van Ark et al. (1999)	CA, FR, DE, NL, US, 1990s	Descriptive, comparative analysis and case studies	Productivity	Capital intensity Scale and scope Innovation Deregulation	Positive Positive Insignificant Mostly positive
Van der Lijn et al. (2004)	Netherlands, network industries, 1990s	Descriptive analysis	Productivity	Entry liberalisation, Regulatory reform	Ambiguous (depends on sector)
Wölfl (2005)	OECD countries, 1980-2001	Descriptive, correlation matrices	Productivity growth	Labour intensity Innovation Competition Economies of scale	Negative Positive Positive Ambiguous (depends on sector)
Wölfl (2003)	OECD countries, 1987-2001	Descriptive	Productivity growth	Measurement bias	Bias downwards
Wolff (1999)	US, 1958-87	Econometric	TFP growth	Computerisation Human capital	Negative Negative

Table A.4 Overview of selected empirical studies on price and inflation developments in services sectors and their main determinants

Author(s)	Country, period	Methods	Dependent variable	Explanatory variable	Impact/ Main findings
Aucremanne and Dhyne (2004)	Belgium, 1989-2001	Econometric	Main finding: Services are characterised by lower frequency of price changes, higher price rigidity and large size of price change relative to manufacturing		
Baumgartner et al. (2005)	Austria, 1996-2003	Econometric – Logit estimation	Probability of price change	Duration of price spell	Positive
			Main finding: Services are characterised by lower frequency of price changes, higher price rigidity and large size of price change relative to manufacturing		
Dhyne et al. (2005)	Euro area, 1993-2003	Econometric – Pooled regression	Frequency of price changes	Inflation volatility Sales Services	Positive Positive Negative
Betancourt and Gautschi (1993)	US, 1992, 49 retail indices	Econometric analysis	Retail margins	Retail output Market structure	Negative Non-significant
Bilke (2005)	France, 1973-2004	Econometric analysis	Structural break Price increase	Services industry affiliation	Positive Positive
Cavelaars (2003)	23 OECD countries, 1988-2000	Econometric – panel data analysis	Inflation rate	Mark-up GDP/capita Competitiveness index	Positive Negative Negative
Copenhagen Economics (2005)	European Economic Area	GEM simulations	Prices Output Quality	Removing barriers in the internal market	Negative Positive Positive
Dias et al. (2004)	Portugal, 1992-2001	Econometric	Frequency of price changes Price rigidity Size of price increase Price developments	Services industry affiliation	Negative Positive Positive Negative
De Nederlandsche Bank (2005)	EA12, US, 1960-2005	Descriptive analysis using HICP figures	Price convergence	Trade links Exchange rate stability	Positive Positive
ECB (2002b)	EA12, 1990-2002	Descriptive analysis	Price level differences in EA	Non-tradability Downward convergence of inflation rates Competition	Positive Positive Negative
ECB (2004a)	EA12, 1960-2004	Descriptive	Profit margin differences	Labour input Intermediate input cost fluctuation Services sector	All named factors contribute to price divergence
Kalirajan (2000)	38 GATT countries, 2000, distribution services	Econometric analysis	Price-cost margins	Trade restrictiveness index Private practices	Negative Positive
Lünnemann and Mathä (2005)	EU15, EA12, 1996-2004	Econometric – panel data estimation	Frequency of price changes Price rigidity Size of price increase	Services industry affiliation	Positive
Nakamura (1999)	US, 1970-1995	Descriptive	Price divergence	Competition Product variety Info. technology	Negative Positive Positive
Neiss (2001)	24 OECD countries, 1973-1988	Econometric analysis	Inflation	Mark-up Competitiveness index GDP/capita	Positive Negative Negative
Przybyla and Roma (2005)	EU15, 1980-2001	Econometric analysis	Inflation	Mark-up Profit margins Profit rate Intensity of competition GDP/capita	Positive Positive Non-significant Negative Negative
Martin et al. (2005)	EU15, 1995-2002	Comparative and descriptive analyses	Price developments	Regulatory framework	Lighter regulation associated with more products and lower prices

ANNEX 4

TABLES

Table A.5 Labour productivity growth (1981-2003)

(percentages)

		BE	DE [1]	GR	ES	FR
Grand total	**01-99**	1.51	1.54		1.28	1.73
Total manufacturing	**15-37**	3.66	2.11		2.07	3.38
Wholesale and retail trade; restaurants and hotels	**50-55**	0.37	0.40		-0.15	1.59
Wholesale and retail trade; repairs	50-52	0.53	1.17		-0.06	2.69
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		0.13		-0.38	0.44
Wholesale, trade & commission excl. motor vehicles	51		1.81		0.11	3.94
Retail trade excl. motor vehicles; repair of household goods	52		0.99		-0.06	2.31
Hotels and restaurants	55	-0.17	-3.99		-0.68	-2.06
Transport and storage and communication	**60-64**	2.17	4.50		2.29	2.86
Transport and storage	60-63		2.19		1.67	1.61
Land transport; transport via pipelines	60		0.98		2.11	
Water transport	61		8.92		3.53	
Air transport	62		5.55		4.26	
Supporting and auxiliary transport activities	63		2.02		-0.92	
Post and telecommunications	64		7.84		3.17	6.00
Finance, insurance, real estate and business services	**65-74**	-0.02	0.14		-0.84	-0.02
Financial intermediation	65-67	3.02	2.15		1.43	1.63
Financial intermediation, except insurance and pension funding	65		3.21		1.85	2.29
Insurance and pension funding, except compulsory social security	66		-0.48		-0.86	
Activities related to financial intermediation	67		0.17		1.14	
Real estate, renting and business activities	70-74	-1.27	-0.83		-2.01	-0.52
Real estate activities	70		-0.59		-1.25	1.46
Renting of m&eq and other business activities	71-74		-0.06		-0.48	-0.61
Renting of machinery and equipment	71		3.66		-1.55	
Computer and related activities	72		3.51		-1.15	
Research and development	73		0.34		2.00	
Other business activities	74		-0.98		-0.51	
Community, social and personal services	**75-99**	0.32	0.07		0.46	0.27
Public admin. and defence; compulsory social security	75	0.99	1.15		0.83	1.09
Education	80	0.38	-0.10		0.70	-0.64
Health and social work	85	-0.87	-0.50		0.50	-0.03
Other community, social and personal services	90-93	0.68	-0.14		-0.24	
Private households with employed persons	95	-0.79	-0.03			
Extra-territorial organisations and bodies	99					
Total services	**50-99**	0.81	1.10		0.26	0.94
Business services	**50-74**	1.06	1.56		0.30	1.19

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) Data for sectors 50, 51, 52, 60-63, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71-74, 71, 72, 73 and 74 refer to the period 1981-2002.
2) Data for all sectors refer to the period 1981-2002.
3) Data for sectors 60, 61, 62 and 63 refer to the period 1981-2002.
4) Data for sectors 63, 75-99, 95 refer to the period 1981-2002. Data for sectors 71, 73 and 74 refer to the period 1981-2001.
5) Data for all sectors refer to the period 1981-2002.
6) The euro area aggregate does not include Greece. Ireland is included only up to 2002.
7) Data for all sectors refer to the period 1981-2001.

IE [2]	IT [3]	LU	NL	AT	PT	FI [4]	DK	SE	UK [5]	EA [6]	US [7]
4.33	1.26	2.14	1.00	1.85	2.22	2.33	1.51	2.01	3.83	1.52	1.43
11.46	1.94	4.48	2.61	3.84	2.30	4.74	2.03	4.89	6.20	3.48	3.56
0.66	0.38	2.02	0.98	1.64	0.50	1.97	1.23		3.75	0.65	2.77
1.09	0.94	2.53	1.22	2.11	0.80	2.10	1.49	2.78		1.27	2.90
1.43	1.35	3.51	0.84	-0.15		1.96	-1.28				1.28
1.74	1.10	3.62	2.03	3.31		1.72	2.57				4.25
1.26	0.60	1.46	0.95	1.47		2.41	0.85				2.44
-0.70	-1.72	-0.32	-1.51	0.12	-0.69	1.36	-0.60			-1.79	0.14
2.82	3.26	7.06	2.93	2.60	4.83	3.55	3.37		3.00	3.38	2.24
4.35	1.76	5.63	1.54	1.28		2.48	2.82				1.48
4.22	2.01	5.63	1.04	0.89		1.96	0.35				1.27
4.37	3.49	5.63	2.98	9.51		2.41					1.50
4.59	0.35		4.63	4.20		4.31	-0.83				1.45
2.95	2.11	5.63	1.13	-0.02		2.93	2.18				1.88
1.87	8.05	8.41	5.95	5.25		7.35	5.05				3.26
	-1.70	-1.16	0.14	-0.12	0.80	-0.03	0.12	-0.75	3.04	-0.28	-0.15
	0.87	0.65	0.26	1.31	8.00	1.63	2.18	2.75		1.70	1.41
1.33	1.17	0.90	0.41	1.69		5.06	1.74				1.37
2.30	0.59	2.49	1.44	2.05		3.75	2.30				-1.63
0.86	-0.59	-2.88	-1.45	-3.03		3.57	5.29				4.29
-1.10	-2.81	-2.90	-0.55	-0.75	-3.06	-0.76	-0.61	-1.58		-1.12	-0.96
-0.63	-2.20	-2.00	-0.78	1.06		1.79	-0.92				1.11
	-1.90	-1.60	0.22	0.29		-0.92	1.50				-0.08
6.29		3.79	0.46	6.32		-1.15	5.10				3.24
-1.25	-1.56	-2.22	-0.66	1.21		-1.69	5.22				1.09
1.08			-1.69	0.38		0.16	0.88				1.80
-2.08	-1.98	-1.96	0.16	-0.61		-0.77	0.63				-1.21
	-0.37	1.23	-0.22	-0.48	0.62	0.06	0.47	0.47	4.21		-0.17
0.60	1.64	0.34	1.15	0.76	0.84	0.31	0.65			1.02	0.35
3.18	-0.75	1.37	0.88	0.28	-0.02	-0.26	0.46			-0.22	-0.62
2.38	0.31	1.50	-1.14	-1.45	-0.38	-0.07	0.38			-0.25	-1.39
	-1.00	1.51		-1.65	2.05	0.06	0.59				0.15
2.73	-4.10	-1.24	-0.08	-2.35		-0.39	-1.09				1.56
1.41	0.30	1.73	0.66	0.76	1.25	1.27	1.00	1.14	3.73	0.78	1.11
1.05	0.53	1.70	1.10	1.37	1.69	1.98	1.30	1.37	3.36	1.10	1.60

Table A.5 Labour productivity growth (1981-1990)

(percentages)

		BE	DE	GR	ES	FR
Grand total	**01-99**	1.82	1.43		1.90	2.31
Total manufacturing	**15-37**	4.55	1.71		2.58	3.09
Wholesale and retail trade; restaurants and hotels	**50-55**	-0.84	0.77		-0.08	2.31
Wholesale and retail trade; repairs	50-52	-0.92	1.32		-0.33	4.07
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		1.75		-0.61	3.02
Wholesale, trade & commission excl. motor vehicles	51		1.61		-0.25	3.69
Retail trade excl. motor vehicles; repair of household goods	52		1.05		-0.25	4.82
Hotels and restaurants	55	0.56	-2.09		-0.21	-3.05
Transport and storage and communication	**60-64**	3.08	2.22		2.25	3.38
Transport and storage	60-63		1.33		2.06	2.33
Land transport; transport via pipelines	60		1.40		1.80	
Water transport	61		1.30		0.74	
Air transport	62		0.82		5.46	
Supporting and auxiliary transport activities	63		1.40		1.92	
Post and telecommunications	64		3.57		1.79	6.70
Finance, insurance, real estate and business services	**65-74**	0.13	1.01		0.48	0.25
Financial intermediation	65-67	4.30	1.44		4.29	2.15
Financial intermediation, except insurance and pension funding	65		1.84		4.46	3.66
Insurance and pension funding, except compulsory social security	66		0.91		2.54	
Activities related to financial intermediation	67		0.58		4.67	
Real estate, renting and business activities	70-74	-1.69	0.36		-2.01	-0.39
Real estate activities	70		0.87		-0.38	-0.58
Renting of m&eq and other business activities	71-74		1.07		-0.60	0.02
Renting of machinery and equipment	71		7.74		-5.30	
Computer and related activities	72		4.28		-0.04	
Research and development	73		-0.29		1.00	
Other business activities	74		0.05		-0.46	
Community, social and personal services	**75-99**	0.47	-0.21		0.19	0.32
Public admin. and defence; compulsory social security	75	0.54	0.60		0.44	0.93
Education	80	0.63	-0.05		0.89	-1.61
Health and social work	85	-0.77	-1.72		-0.01	0.34
Other community, social and personal services	90-93	1.09	0.68		-0.39	
Private households with employed persons	95	0.54	-0.08			
Extra-territorial organisations and bodies	99	0.00	0.00			
Total services	**50-99**	0.79	1.03		0.43	1.39
Business services	**50-74**	0.92	1.69		0.86	1.75

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) The euro area aggregate does not include Greece.

IE	IT	LU	NL	AT	PT	FI	DK	SE	UK	EA [1]	US
3.96	1.74	3.26	1.49	2.10	2.84	2.61	1.36	1.61	5.30	1.83	1.33
10.83	2.76	5.75	3.23	3.88	2.31	4.75	1.10	2.87	8.18	4.74	3.56
2.39	0.13	2.80	1.57	1.74	0.62	2.89	0.71		4.62	0.89	1.77
3.39	0.64	2.88	1.53	2.26	0.87	3.09	0.87	2.25		1.50	1.86
3.32	0.64	4.73	2.25	0.38		0.73	-3.22				2.05
4.58	0.64	4.28	2.38	3.32		4.24	1.51				2.80
2.97	0.64	2.28	2.11	1.33		2.54	1.38				1.04
-1.84	-1.90	2.22	-0.82	-0.02	0.09	1.87	-0.12			-1.59	-0.30
-0.68	3.18	7.41	2.55	3.18	4.86	2.92	2.68		7.22	2.76	1.72
0.32	2.56	5.89	2.19	2.36		2.42	2.29				1.63
-0.73	2.73	5.89	2.92	1.95		1.93	0.02				1.74
3.33	2.73	5.89	0.53	16.59		0.94					1.79
-0.73	2.73		5.60	5.47		4.93	0.37				0.51
-0.13	2.73	5.89	0.94	0.82		3.10	2.76				2.16
-1.60	6.18	6.36	3.70	4.95		5.79	3.86				2.10
	-2.23	0.35	0.51	1.18	1.42	0.24	0.35	-1.97	4.73	0.19	-1.19
	0.32	0.58	-1.04	2.40	7.48	4.48	2.61	1.58		1.83	-1.06
-1.53	0.32	1.03	-2.74	3.99		4.58	1.70				-0.31
-1.28	0.32	3.59	5.09	-0.49		2.66	4.97				-5.13
-2.59	0.32	-5.34	-3.57	-6.36		0.35	9.81				1.08
-1.54	-3.73	0.13	-0.57	0.47	-2.57	-1.42	-0.51	-3.02		-0.83	-1.65
-2.87	-3.73	-0.54	-0.22	2.22		1.91	-2.19				0.76
	-3.73	1.30	-0.08	0.69		-1.53	2.39				-0.31
4.60		6.60	1.82	8.20		-3.52	..				-0.60
-2.88	-3.73	1.47	-0.60	1.36		-1.82	5.18				2.28
0.38			0.08	-3.12		0.96	1.26				2.01
-1.95	-3.73	0.70	-0.17	-0.24		-1.39	3.31				-0.98
	-0.90	3.25	-0.11	-0.51	1.23	0.51	0.22	0.43	5.93	-0.17	0.05
3.82	1.77	1.26	1.54	0.68	0.30	0.85	0.12			0.78	0.60
1.62	-1.23	3.46	2.01	0.37	0.67	-0.05	0.29			-0.50	-0.49
3.82	-0.15	0.58	-1.22	-1.48	-0.11	0.58	-0.15			-0.61	-1.78
	-1.81	6.98		-2.15	4.33	0.62	1.60				0.88
3.82	-7.42	-1.05	-2.28	-3.16		-0.63	-0.94				2.75
0.00	0.00	0.00		0.00		0.00	0.00				
1.56	0.14	3.27	0.95	1.12	1.68	1.63	0.84	0.88	5.54	0.90	0.61
0.73	0.62	3.10	1.56	1.97	2.04	2.38	1.28	0.90	5.06	1.41	0.75

Table A.5 Labour productivity growth (1991-2003)

(percentages)

		BE	DE [1]	GR	ES	FR
Grand total	**01-99**	1.27	1.62		0.80	1.28
Total manufacturing	**15-37**	2.97	2.42		1.68	3.61
Wholesale and retail trade; restaurants and hotels	**50-55**	1.30	0.12		-0.21	1.05
Wholesale and retail trade; repairs	50-52	1.66	1.06		0.14	1.64
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		-1.20		-0.19	-1.50
Wholesale, trade & commission excl. motor vehicles	51		1.97		0.39	4.13
Retail trade excl. motor vehicles; repair of household goods	52		0.94		0.08	0.42
Hotels and restaurants	55	-0.73	-5.43		-1.04	-1.29
Transport and storage and communication	**60-64**	1.47	6.30		2.31	2.47
Transport and storage	60-63		2.91		1.37	1.07
Land transport; transport via pipelines	60		0.63		2.35	
Water transport	61		15.70		5.74	
Air transport	62		9.66		3.34	
Supporting and auxiliary transport activities	63		2.54		-3.06	
Post and telecommunications	64		11.53		4.24	5.46
Finance, insurance, real estate and business services	**65-74**	-0.15	-0.53		-1.85	-0.22
Financial intermediation	65-67	2.05	2.70		-0.72	1.24
Financial intermediation, except insurance and pension funding	65		4.37		-0.11	1.24
Insurance and pension funding, except compulsory social security	66		-1.63		-3.41	
Activities related to financial intermediation	67		-0.17		-1.50	
Real estate, renting and business activities	70-74	-0.95	-1.73		-2.02	-0.62
Real estate activities	70		-1.78		-1.92	3.05
Renting of m&eq and other business activities	71-74		-0.99		-0.39	-1.09
Renting of machinery and equipment	71		0.38		1.44	
Computer and related activities	72		2.87		-2.00	
Research and development	73		0.86		2.77	-1.41
Other business activities	74		-1.84		-0.54	
Community, social and personal services	**75-99**	0.21	0.28		0.67	0.23
Public admin. and defence; compulsory social security	75	1.34	1.58		1.13	1.21
Education	80	0.18	-0.14		0.57	0.11
Health and social work	85	-0.94	0.45		0.88	-0.32
Other community, social and personal services	90-93	0.36	-0.76		-0.12	
Private households with employed persons	95	-1.79	0.00			
Extra-territorial organisations and bodies	99	0.00	0.00			
Total services	**50-99**	0.83	1.15		0.13	0.59
Business services	**50-74**	1.18	1.45		-0.14	0.77

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) Data for sectors 50, 51, 52, 60-63, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71-74, 71, 72, 73 and 74 refer to the period 1991-2002.
2) Data for all sectors refer to the period 1991-2002.
3) Data for sectors 60, 61, 62 and 63 refer to the period 1991-2002.
4) Data for sectors 63, 75-99, 95 and 50-99 refer to the period 1991-2002. Data for sectors 71, 73 and 74 refer to the period 1991-2001.
5) Data for all sectors except 01-99, 15-37, 50-55, 50-52, 50, 51, 52, 55 and 60-64 refer to the period 1994-2003.
6) Data for all sectors refer to the period 1991-2002.
7) The euro area aggregate does not include Greece. Ireland is included only up to 2002.
8) Data for all sectors refer to the period 1991-2001.

IE [2]	IT [3]	LU	NL	AT	PT	FI [4]	DK	SE [5]	UK [6]	EA [7]	US [8]
4.65	0.89	1.29	0.62	1.66	1.74	2.12	1.62	2.33	2.63	1.28	1.52
11.98	1.31	3.51	2.14	3.80	2.29	4.74	2.75	6.46	4.59	2.52	3.56
-0.76	0.56	1.41	0.54	1.57	0.40	1.26	1.63		3.02	0.46	3.69
-0.79	1.17	2.27	0.98	2.00	0.75	1.34	1.98	3.19	2.47	1.09	3.85
-0.12	1.90	2.49	-0.24	-0.42		2.91	-0.11				0.59
-0.56	1.46	2.93	1.76	3.05		-0.17	3.22				5.60
-0.14	0.57	0.72	0.07	1.55		2.32	0.48				3.72
0.26	-1.59	-2.23	-2.04	0.23	-1.28	0.97	-0.96		5.51	-1.94	0.54
5.82	3.32	6.79	3.22	2.15	4.82	4.04	3.90		-0.39	3.85	2.72
7.83	1.15	5.41	1.04	0.56		2.53	3.07	1.92	0.66		1.35
8.54	1.42	5.41	-0.38	0.36		1.99	0.65	2.45			0.84
5.24	4.12	5.41	4.90	3.73		3.56	14.28	2.94			1.24
9.23	-1.59		3.89	2.24		3.83	-1.61	-2.60			2.32
5.60	1.59	5.41	1.28	-0.69		2.79	1.63	1.59			1.62
4.87	9.52	10.16	7.71	6.11		8.56	6.00	6.27	-2.22		4.32
	-1.30	-2.31	-0.15	-1.10	0.33	-0.23	-0.05	-1.03	1.65	-0.63	0.81
	1.29	0.69	1.27	0.48	8.41	-0.51	1.85	2.13	1.82	1.60	3.71
3.78	1.82	0.97	2.91	-0.56		5.43	2.17		0.96		2.92
5.38	0.80	1.49	-1.27	3.77		4.59	0.64		4.53		1.66
3.83	-1.28	-0.80	0.21	-0.61		6.11	2.06		3.15		7.30
-0.73	-2.09	-5.17	-0.54	-1.68	-3.44	-0.25	-0.69	-1.68	1.41	-1.35	-0.34
1.28	-1.01	-2.58	-1.22	0.30		1.70	0.17	0.99	0.59		1.43
	-0.46	-3.77	0.44	0.14		-0.46	0.84	-0.49	0.95		0.13
7.72		1.03	-0.58	5.17		1.06	..	3.01	1.54		6.87
0.13	0.15	-5.62	-0.70	1.68		-1.59	4.98	-1.66	-3.62		0.02
1.66			-3.03	3.06		-0.57	0.65	-0.45	1.27		1.60
-2.19	-0.61	-3.83	0.42	-0.86		-0.20	-1.30		1.42		-1.42
	0.04	-0.30	-0.30	-0.47	0.16	-0.32	0.66	0.46	2.79		-0.37
-2.01	1.54	-0.36	0.86	0.82	1.26	-0.10	1.07		3.10	1.20	0.13
4.50	-0.38	-0.22	0.02	0.20	-0.55	-0.42	0.59		3.93	0.00	-0.74
1.19	0.66	2.21	-1.08	-1.43	-0.58	-0.56	0.79		2.37	0.03	-1.04
	-0.36	-2.51	-0.48	-1.27	0.33	-0.36	-0.18		1.88		-0.51
1.82	-1.47	-1.38	1.64	-1.72		-0.18	-1.21				0.49
						0.00	0.00				
1.29	0.43	0.56	0.44	0.49	0.92	1.00	1.12	1.33	2.24	0.69	1.57
1.32	0.46	0.65	0.75	0.91	1.42	1.67	1.32	1.73	1.96	0.87	2.38

Table A.5 Labour productivity growth (1996-2003)

(percentages)

		BE	DE [1]	GR	ES	FR
Grand total	**01-99**	1.02	1.29	2.31	0.48	1.12
Total manufacturing	**15-37**	3.23	1.75	2.79	1.02	3.03
Wholesale and retail trade; restaurants and hotels	**50-55**	1.12	-0.28	2.64	-0.37	0.80
Wholesale and retail trade; repairs	50-52	1.36	0.72	2.98	0.20	1.08
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		-0.87		-0.06	-1.35
Wholesale, trade & commission excl. motor vehicles	51		1.30		0.54	3.22
Retail trade excl. motor vehicles; repair of household goods	52		0.33		0.03	-0.17
Hotels and restaurants	55	-0.91	-6.21	1.76	-1.43	-0.38
Transport and storage and communication	**60-64**	1.47	6.68	6.95	2.19	3.12
Transport and storage	60-63		1.51		0.83	0.96
Land transport; transport via pipelines	60		-0.18		1.45	1.57
Water transport	61		19.04		2.81	10.12
Air transport	62		4.63		2.09	1.36
Supporting and auxiliary transport activities	63		-0.79		-2.38	-1.19
Post and telecommunications	64		14.75		5.00	7.67
Finance, insurance, real estate and business services	**65-74**	-0.30	-0.70	-2.16	-1.83	-0.37
Financial intermediation	65-67	0.12	3.53	4.10	1.56	1.81
Financial intermediation, except insurance and pension funding	65		6.18		1.77	1.93
Insurance and pension funding, except compulsory social security	66		-3.72		0.81	1.60
Activities related to financial intermediation	67		1.08		1.27	2.34
Real estate, renting and business activities	70-74	-0.44	-2.01	-4.50	-2.90	-0.89
Real estate activities	70		-0.99		-5.87	2.91
Renting of m&eq and other business activities	71-74		-1.42		-0.75	-1.08
Renting of machinery and equipment	71		-0.98		-0.81	0.31
Computer and related activities	72		4.45		0.64	1.50
Research and development	73		1.93		-1.69	-2.41
Other business activities	74		-2.73		-1.10	-1.75
Community, social and personal services	**75-99**	-0.30	-0.02	0.29	0.50	0.23
Public admin. and defence; compulsory social security	75	0.60	1.10	-0.93	0.93	1.31
Education	80	-0.02	-0.36	-0.30	0.30	-0.44
Health and social work	85	-1.03	0.19	0.79	0.23	-0.36
Other community, social and personal services	90-93	-0.75	-0.93	4.16	0.45	0.81
Private households with employed persons	95	-3.01	-0.27	4.12		
Extra-territorial organisations and bodies	99	0.00	0.00			
Total services	**50-99**	0.45	0.94	1.45	0.14	0.66
Business services	**50-74**	0.89	1.24	1.89	-0.17	0.70

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) Data for sectors 50, 51, 52, 60-63, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71-74, 71, 72, 73 and 74 refer to the period 1996-2002.
2) Data for all sectors refer to the period 1996-2002.
3) Data for sectors 60, 61, 62 and 63 refer to the period 1996-2002.
4) Data for sectors 63, 75-99 and 95 refer to the period 1996-2002. Data for sectors 71, 73 and 74 refer to the period 1996-2001.
5) Data for all sectors refer to the period 1996-2002.
6) The euro area aggregate includes Ireland only up to 2002.
7) Data for all sectors refer to the period 1996-2001.

IE [2]	IT [3]	LU	NL	AT	PT	FI [4]	DK	SE	UK [5]	EA [6]	US [7]
5.77	0.30	0.82	0.59	1.42	1.37	1.53	1.48	1.94	1.59	0.95	1.75
15.12	0.16	2.78	1.50	3.99	2.23	3.80	2.67	5.93	3.05	1.91	3.40
2.19	-0.23	2.75	1.51	1.94	-0.05	1.06	1.39	2.37	2.19	0.21	5.18
2.58	0.24	3.39	1.84	2.28	0.42	1.31	1.87	2.48	1.88	0.71	5.49
4.52	-0.23	3.47	0.11	0.81		2.10	-1.30				2.36
3.59	-0.25	3.94	3.16	2.94		0.96	3.85				7.23
2.61	0.45	1.91	0.05	1.93		1.05	-0.67				5.23
1.25	-1.72	-0.43	-0.96	0.89	-1.99	-0.41	-2.53	1.77	3.68	-1.62	-0.84
3.23	2.11	3.94	4.06	2.20	3.60	3.57	4.77	2.92	-2.33	4.32	2.52
6.55	-0.64	2.58	0.99	0.71		1.54	4.53	1.35	-0.84		0.72
6.82	-0.47	2.58	0.39	0.71		1.62	0.96	1.61			0.15
0.46	4.88	2.58	4.00	12.51		1.99	14.70	3.73			0.86
9.97	-5.60		1.06	-3.46		2.26	1.86	-2.37			0.92
4.96	-0.30	2.58	1.34	0.27		1.76	2.96	0.93			2.86
0.01	9.72	7.54	10.05	4.36		9.76	6.60	5.80	-4.96		4.17
	-1.89	-3.04	-0.43	-2.58	2.45	-2.00	0.08	-1.05	0.18	-1.06	1.32
	1.39	-0.61	0.47	-0.41	11.11	-0.42	4.73	1.60	-1.54	2.50	5.16
-0.95	2.56	-0.69	2.01	-1.34		8.95	4.50		-0.59		4.30
-1.41	-0.74	-2.89	-2.52	4.30		7.83	5.85		-4.03		0.50
-1.41	-3.02	1.32	0.79	0.88		5.24	1.07		0.77		10.80
0.91	-2.84	-5.06	-0.69	-3.36	-1.17	-2.32	-1.27	-1.60	0.39	-2.06	-0.13
4.89	-1.66	-2.60	-1.25	0.56		-0.71	-0.01	1.14	1.13		1.29
	-0.33	-3.81	0.19	-2.37		-0.84	-0.33	-0.51	0.07		0.79
14.38		1.24	1.01	3.32		1.51	-2.52	5.29	-2.18		5.37
2.85	1.13	-4.29	-0.12	-0.14		-1.90	0.08	-3.17	-5.70		-2.72
5.98			-2.63	-5.36		-1.19	0.71	-0.32	0.14		2.33
-1.63	-0.66	-3.96	-0.13	-2.99		-0.81	-0.79		1.08		-0.18
	0.10	-0.67	-0.36	-1.01	0.00	-0.62	-0.01	0.38	2.70	-0.01	-0.02
-1.69	0.92	-0.37	0.80	0.56	1.42	-0.29	0.42		2.09	0.85	0.28
6.24	-0.64	-0.15	-0.58	-0.26	-0.72	-0.70	0.64		3.46	-0.37	-1.17
-0.06	1.93	1.11	-1.24	-2.42	-0.89	-0.93	0.05		2.83	0.06	-0.11
	-0.13	-3.34	-0.52	-1.80	-0.25	-0.64	-0.88		2.07	-0.44	-0.69
9.71	-1.52	-1.88	2.92	-2.95		-0.78	-1.50				-0.94
		0.00		0.00		0.00	0.00				
2.05	0.06	0.07	0.59	0.12	0.97	0.50	1.08	0.84	1.38	0.59	2.33
2.21	-0.25	0.07	1.12	0.57	1.53	0.61	1.58	0.88	0.67	0.68	3.23

Table A.6 Productivity per hour growth (1996-2003)

(percentages)

		BE [1]	DE [1]	GR	ES	FR
Grand total	**01-99**	0.62	1.96	2.28	0.59	2.07
Total manufacturing	**15-37**	3.07	1.96	2.86	1.27	4.02
Wholesale and retail trade; restaurants and hotels	**50-55**	-0.16	0.26	2.81	-0.07	1.82
Wholesale and retail trade; repairs	50-52	0.09	1.25	3.09	0.56	
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		0.31		-0.04	
Wholesale, trade & commission excl. motor vehicles	51		1.93		0.98	
Retail trade excl. motor vehicles; repair of household goods	52		1.20		0.44	
Hotels and restaurants	55	-1.85	-5.57	2.08	-1.60	
Transport and storage and communication	**60-64**	0.68	8.11	6.76	2.55	
Transport and storage	60-63		2.43		1.16	1.08
Land transport; transport via pipelines	60		0.67		1.61	
Water transport	61		20.26		4.84	
Air transport	62		5.41		0.42	
Supporting and auxiliary transport activities	63		0.20		-1.34	
Post and telecommunications	64		15.57		6.05	
Finance, insurance, real estate and business services	**65-74**	-1.56	-0.12	-2.82	-1.43	
Financial intermediation	65-67	-0.08	4.53	1.24	2.48	2.81
Financial intermediation, except insurance and pension funding	65		6.61		3.06	
Insurance and pension funding, except compulsory social security	66		-2.66		-0.23	
Activities related to financial intermediation	67		1.88		1.28	
Real estate, renting and business activities	70-74	-2.59	-1.56	-4.53	-2.55	
Real estate activities	70		-0.56		-6.31	3.68
Renting of m&eq and other business activities	71-74		-0.79		-0.30	
Renting of machinery and equipment	71		-0.26		-1.16	
Computer and related activities	72		5.44		1.15	
Research and development	73		3.18		-1.09	
Other business activities	74		-2.18		-0.57	
Community, social and personal services	**75-99**	-0.37	0.61	0.15		
Public admin. and defence; compulsory social security	75	0.40	1.69	-1.19		
Education	80	-0.12	0.39	0.01		
Health and social work	85	-1.30	1.01	0.49		
Other community, social and personal services	90-93	-1.03	-0.66	3.63		
Private households with employed persons	95	-1.68	0.12	3.89		
Extra-territorial organisations and bodies	99					
Total services	**50-99**	-0.18	1.66	1.15		1.49
Business services	**50-74**	-0.27	2.02	1.52	0.18	1.68

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) Data for all sectors refer to the period 1996-2002.
2) Data for sectors 71, 73 and 74 refer to the period 1996-2001. Data for sectors 75-99 and 95 refer to the period 1996-2002.
3) Data for sectors 60, 61, 62, 63, 65, 66, 67, 70, 71-74, 71, 72, 73 and 74 refer to the period 1996-2002.
4) Data are calculated by aggregating the productivity per hour in BE, DE, GR, ES, FR, IE, IT, LU, NL and FI during the period 1996-2002; FR dropped in lower level aggregates 60-64 and 65-74.

IE [1]	IT	LU [1]	NL	AT	PT	FI [2]	DK [3]	SE	UK [1]	EA [4]	US [1]
7.18	0.75	0.92	0.82			1.95	1.63	2.00	1.82	1.47	1.63
16.65	0.28	2.56	1.70			3.98	3.06	6.21	3.52	2.25	3.61
3.55	0.59	3.11	1.60			1.49	2.01	3.11	2.05	0.74	5.11
3.94	0.79	3.70	1.90			1.91	2.63	3.34	1.74		5.40
5.91		3.71	0.74			2.86	-1.28				2.27
4.97		4.18	3.15			1.55	4.84				7.20
3.98		2.25	0.03			1.67	-0.19				4.90
2.60	0.14	0.06	-0.55			-0.72	-2.96	1.86	3.54		-0.58
4.60	1.66	4.47	4.33			3.53	4.62	3.97	-1.82	4.86	3.22
7.97		2.64	1.32			1.51	3.99	2.38	-0.32		1.68
8.24		2.64	0.51			1.38	0.03	2.54			0.49
1.80		2.64	7.08			2.80	16.29	6.05			2.08
11.44			1.08			2.34	1.43	-1.48			3.51
6.36		2.64	2.01			1.53	1.87	1.87			3.60
1.34		7.61	9.91			9.61	5.80	6.86	-4.46		4.39
	-1.59	-3.36	-0.49			0.15	0.05	0.02	0.23	-1.02	0.72
	1.52	-1.01	1.08			8.95	5.90	2.83	-1.75	2.06	5.08
0.37		-0.62	2.37			9.33	5.09		-0.81		4.41
-0.09		-2.82	-0.91			8.28	5.90		-4.23		0.45
-0.09		1.38	1.02			5.49	-0.30		0.55		10.36
2.25	-2.39	-5.36	-0.97			-1.64	-1.43	-0.56	0.51		-0.99
6.29		-2.54	-1.11			0.16	-0.03	2.48	1.26		0.79
		-3.62	-0.12			-0.18	-0.33	0.54	0.19		-0.07
15.91		1.31	0.50			1.82	-2.28	5.61	-2.06		4.95
4.22		-4.23	0.31			-1.27	-1.59	-2.09	-5.59		-3.52
7.40			-2.43			-1.11	0.33	0.66	0.27		1.55
-0.32		-4.00	-0.44			0.33	-0.42		1.20		-1.07
	0.58	-0.62	0.07			-0.39	-0.50	0.56	2.71		-0.19
-0.38	1.67	-0.08	1.50			-0.19	1.23		2.22		0.60
7.65	-1.02	-0.04				0.47	1.55		3.59		-1.54
1.27	2.65	1.11	-0.46			-1.14	-2.20		2.96		-0.76
	0.46	-3.82				-0.89	-1.33		1.65		-1.21
11.17	-0.44	-1.84	-1.80			-0.89	-2.93				-0.98
							0.00				
3.40	0.51	0.17	0.77			1.06	1.01	1.37	1.38		2.14
3.57	0.33	0.12	1.14			1.58	1.84	1.83	0.69	1.08	3.03

Table A.7 Value added price changes (1981-2003)

(percentages)

		BE	DE [1]	GR	ES	FR
Grand total	**01-99**	3.01	2.02		6.33	3.42
Total manufacturing	**15-37**	1.75	1.96		4.62	1.66
Wholesale and retail trade; restaurants and hotels	**50-55**	4.65	2.27		8.00	3.70
Wholesale and retail trade; repairs	50-52	4.59	2.02		6.92	2.73
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		3.06		6.98	5.12
Wholesale, trade & commission excl. motor vehicles	51		1.71		6.94	1.67
Retail trade excl. motor vehicles; repair of household goods	52		2.18		6.88	2.95
Hotels and restaurants	55	5.13	4.31		10.34	7.02
Transport and storage and communication	**60-64**	2.61	-0.35		5.81	1.49
Transport and storage	60-63		1.15		6.04	2.52
Land transport; transport via pipelines	60		1.49		5.39	
Water transport	61		-2.18		11.24	
Air transport	62		-0.61		3.28	
Supporting and auxiliary transport activities	63		1.95		7.94	
Post and telecommunications	64		-1.87		5.67	-1.07
Finance, insurance, real estate and business services	**65-74**	3.42	2.42		7.28	4.24
Financial intermediation	65-67	2.48	0.52		8.06	3.73
Financial intermediation, except insurance and pension funding	65		-0.79		8.07	2.48
Insurance and pension funding, except compulsory social security	66		3.16		8.23	
Activities related to financial intermediation	67		3.07		7.71	
Real estate, renting and business activities	70-74	3.72	2.82		6.88	4.34
Real estate activities	70		3.22		6.73	4.71
Renting of m&eq and other business activities	71-74		2.59		7.47	4.01
Renting of machinery and equipment	71		2.26		7.32	
Computer and related activities	72		1.24		7.43	
Research and development	73		2.81		7.34	4.44
Other business activities	74		2.94		7.50	
Community, social and personal services	**75-99**	3.41	2.56		6.50	4.67
Public admin. and defence; compulsory social security	75	3.27	2.36		5.62	3.94
Education	80	3.20	2.57		6.66	5.71
Health and social work	85	3.86	2.59		7.06	5.17
Other community, social and personal services	90-93	3.78	3.10		6.97	
Private households with employed persons	95	3.09	0.68			
Extra-territorial organisations and bodies	99		0.00			
Total services	**50-99**	3.60	2.13		7.08	3.97
Business services	**50-74**	3.74	1.93		7.32	3.73

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) Data for sectors 50, 51, 52, 60-63, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71-74, 71, 72, 73 and 74 refer to the period 1981-2002.
2) Data for all sectors refer to the period 1981-2002.
3) Data for sectors 60, 61, 62 and 63 refer to the period 1981-2002.
4) Data for sectors 60-63, 60, 61, 62, 63 and 64 refer to the period 1981-2002.
5) Data for sectors 71, 73 and 74 refer to the period 1981-2001. Data for sectors 75-99 and 95 refer to the period 1981-2002.
6) Data for sectors 70 and 71-74 refer to the period 1981-2002.
7) Data for all sectors refer to the period 1981-2002.
8) The euro area aggregate does not include Greece and Ireland and for the sector 75-99 refers to the period 1981-2002.
9) Data for sector 01-99 refer to the period 1981-2002. Data for all other sectors refer to the period 1981-2001.

IE [2]	IT [3]	LU [4]	NL	AT	PT	FI [5]	DK	SE [6]	UK [7]	EA [8]	US [9]
4.30	6.36	3.14	2.21	2.56	9.81	3.93	3.87	4.35	2.59	3.70	3.08
0.72	5.00	0.69	1.53	1.56	9.34	1.99	3.61	2.51	1.03	1.85	1.39
6.53	6.35	2.77	2.05	1.99	9.91	3.91	3.32		3.04	4.30	1.82
6.20	5.93	2.24	1.80	1.43	9.42	3.88	3.10	3.30		3.70	1.66
6.20	6.13	2.31	2.40	4.21		3.26	6.09				3.61
6.20	5.47	1.02	1.22	0.39		4.49	2.27				0.58
6.20	6.22	3.02	1.51	1.75		3.22	3.13				1.90
7.94	8.01	5.52	3.91	3.90	13.29	4.09	5.35			6.98	5.42
4.39	5.09	-0.63	1.01	1.62	8.93	3.75	2.86		4.14	2.24	2.14
5.32	5.69	-0.16	1.54	2.40		4.06	3.11				1.75
5.32	5.63	-0.16	1.98	2.88		4.33	5.30				2.03
5.32	6.12	-0.16	0.31	-1.41		3.31	..				2.16
5.32	5.87		-0.63	-2.82		2.10	4.19				1.01
5.32	5.87	-0.16	2.06	2.65		4.26	4.57				2.11
3.50	3.20	-0.16	0.21	0.03		2.05	2.34				2.56
	7.56	6.49	2.91	4.21	8.93	5.13	4.53	5.79	3.42	4.29	4.79
	5.54	8.05	3.91	3.05	5.62	2.55	4.47	2.35		3.50	6.17
6.63	4.64	8.06	4.42	2.68		2.56	4.35				6.96
6.58	11.17	8.86	1.98	4.07		2.16	4.49				8.34
6.58	7.82	10.66	4.71	3.28		3.73	5.81				2.59
6.72	8.43	4.91	2.88	4.91	10.53	5.74	4.55	6.56		4.53	4.36
6.72	9.04	5.16	3.00	5.41		5.50	5.16	6.82			4.08
	7.70	5.06	2.67	4.22		6.28	3.36	6.63			4.79
6.72		3.01	2.14	2.51		5.68	..				2.58
6.72	7.42	5.14	2.38	3.93		7.08	-0.74				2.79
6.72			2.47	3.78		6.09	4.23				4.66
6.72	7.77	5.25	2.81	4.70		6.49	4.41				5.69
	7.81	3.66	2.86	3.66	12.23	5.94	4.39	5.55	1.69	4.54	4.95
6.61	7.34	5.13	1.63	3.44	11.16	5.72	4.34			3.90	4.53
4.82	8.66	3.82	1.85	3.64	13.00	5.79	4.37			4.99	5.38
6.72	7.56	3.69	3.35	2.84	13.99	6.41	4.23			4.59	6.07
	7.54	2.03		5.47	11.47	5.26	5.04				4.53
6.72	8.01	7.30	4.18	4.13		6.55	4.44				3.37
6.26	7.04	4.20	2.50	3.09	10.33	4.86	4.04	5.05	2.89	4.12	3.82
6.32	6.71	4.40	2.31	2.81	9.36	4.37	3.86	4.75	3.63	3.98	3.34

Table A.7 Value added price changes (1981-1990)

(percentages)

		BE	DE	GR	ES	FR
Grand total	**01-99**	4.34	2.74		9.22	6.04
Total manufacturing	**15-37**	3.18	2.82		7.64	5.05
Wholesale and retail trade; restaurants and hotels	**50-55**	7.40	2.29		11.65	6.68
Wholesale and retail trade; repairs	50-52	7.65	2.02		10.36	5.19
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		1.58		10.68	7.65
Wholesale, trade & commission excl. motor vehicles	51		2.46		10.27	5.17
Retail trade excl. motor vehicles; repair of household goods	52		1.69		10.27	4.33
Hotels and restaurants	55	5.40	4.09		15.23	11.11
Transport and storage and communication	**60-64**	3.73	1.32		8.52	3.90
Transport and storage	60-63		1.79		8.50	4.51
Land transport; transport via pipelines	60		1.80		8.61	
Water transport	61		1.80		17.74	
Air transport	62		1.80		3.64	
Supporting and auxiliary transport activities	63		1.80		8.42	
Post and telecommunications	64		0.66		9.01	1.52
Finance, insurance, real estate and business services	**65-74**	4.70	3.34		9.63	6.77
Financial intermediation	65-67	3.08	2.68		10.93	7.33
Financial intermediation, except insurance and pension funding	65		2.15		10.93	6.33
Insurance and pension funding, except compulsory social security	66		4.14		10.93	
Activities related to financial intermediation	67		3.16		10.93	
Real estate, renting and business activities	70-74	5.15	3.54		9.10	6.64
Real estate activities	70		3.57		8.33	7.60
Renting of m&eq and other business activities	71-74		3.46		11.02	5.77
Renting of machinery and equipment	71		3.61		11.02	
Computer and related activities	72		3.50		11.02	
Research and development	73		3.41		11.02	7.03
Other business activities	74		3.41		11.02	
Community, social and personal services	**75-99**	3.92	3.00		9.22	7.40
Public admin. and defence; compulsory social security	75	3.84	2.48		7.73	6.31
Education	80	3.60	2.56		9.52	9.24
Health and social work	85	4.39	3.99		10.08	7.95
Other community, social and personal services	90-93	4.80	3.42		10.16	
Private households with employed persons	95	3.80	-0.50			
Extra-territorial organisations and bodies	99					
Total services	**50-99**	4.93	2.79		9.98	6.55
Business services	**50-74**	5.52	2.67		10.27	6.34

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) Excluding Greece and Ireland.

IE	IT	LU	NL	AT	PT	FI	DK	SE	UK	EA [1]	US
6.58	10.30	2.65	1.90	3.59	16.81	6.80	6.29	7.38	2.82	5.81	4.25
3.33	8.55	2.10	1.85	2.28	17.00	4.55	6.15	6.99	1.91	2.81	2.83
8.49	10.78	4.20	2.83	2.71	16.84	5.83	6.38		3.52	6.78	3.11
7.97	10.29	3.81	2.72	2.41	16.71	5.52	6.29	6.71		6.04	2.96
7.97	10.29	2.83	2.11	5.37		6.99	9.24				3.99
7.97	10.29	2.13	1.91	1.34		5.14	5.13				1.73
7.97	10.29	4.12	1.94	2.75		5.66	6.08				3.75
10.79	12.72	6.39	3.66	3.82	18.77	7.92	7.32			10.07	6.56
8.04	8.95	0.74	1.57	2.33	15.45	6.29	5.98		3.30	4.66	3.68
8.04	9.13	1.73	1.63	2.62		6.73	5.55				2.24
8.04	9.12	1.73	1.63	3.15		7.38	8.84				2.38
8.04	9.12	1.73	1.33	0.38		5.24	..				2.75
8.04	9.12		0.59	-1.86		3.14	6.42				1.55
8.04	9.12	1.73	1.69	2.30		6.82	6.83				3.20
8.04	7.58	1.73	1.85	1.75		3.77	7.28				5.14
	11.19	5.56	2.22	5.70	17.50	7.75	6.90	9.49	3.51	6.33	6.50
	9.93	6.12	1.61	4.49	17.27	6.88	5.76	9.77		6.29	8.48
7.97	9.93	5.08	2.63	3.87		7.27	6.13				9.22
7.97	9.93	14.47	-3.27	6.12		5.96	3.46				9.91
7.97	9.93	14.28	4.68	2.27		6.26	7.94				5.36
7.97	12.03	5.70	3.09	6.48	16.79	7.94	7.29	9.35		6.39	5.89
7.97	12.03	6.61	4.03	6.64		7.34	7.53	10.28			5.81
	12.03	5.66	2.23	6.11		9.26	6.31	7.54			6.07
7.97		5.07	2.64	3.79		10.32					5.21
7.97	12.03	4.70	2.25	7.24		10.39	4.28				3.45
7.97			1.85	4.82		9.22	6.30				4.88
7.97	-4.65	5.68	2.23	6.44		8.98	6.08				6.60
	12.98	3.47	1.90	5.20	18.18	9.46	6.45	7.47	1.20	6.50	6.26
7.97	12.32	6.58	0.09	4.85	17.34	9.27	6.45			5.53	5.76
10.31	13.81	4.38	-0.51	4.96	18.99	9.67	6.39			7.12	6.41
7.97	12.76	6.15	2.25	4.60	20.46	9.79	6.43			6.92	8.05
	12.62	-3.32		7.57	16.81	8.78	6.72				5.19
7.97	12.97	8.04	4.47	4.83		12.18	7.23				3.46
8.33	11.31	3.88	2.16	4.24	17.34	7.70	6.52	7.68	2.81	6.27	5.24
8.22	10.59	4.09	2.31	3.76	16.99	6.68	6.57	7.92	3.91	6.20	4.79

Table A.7 Value added price changes (1991-2003)

(percentages)

		BE	DE [1]	GR	ES	FR
Grand total	**01-99**	2.00	1.47		4.16	1.45
Total manufacturing	**15-37**	0.66	1.31		2.35	-0.87
Wholesale and retail trade; restaurants and hotels	**50-55**	2.59	2.25		5.27	1.46
Wholesale and retail trade; repairs	50-52	2.30	2.02		4.35	0.88
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		4.31		4.21	3.21
Wholesale, trade & commission excl. motor vehicles	51		1.10		4.46	-0.93
Retail trade excl. motor vehicles; repair of household goods	52		2.58		4.34	1.91
Hotels and restaurants	55	4.92	4.48		6.72	3.99
Transport and storage and communication	**60-64**	1.77	-1.62		3.78	-0.33
Transport and storage	60-63		0.63		4.18	1.01
Land transport; transport via pipelines	60		1.24		2.99	
Water transport	61		-5.38		6.49	
Air transport	62		-2.57		3.00	
Supporting and auxiliary transport activities	63		2.07		7.57	
Post and telecommunications	64		-3.92		3.18	-3.02
Finance, insurance, real estate and business services	**65-74**	2.45	1.71		5.50	2.33
Financial intermediation	65-67	2.02	-1.67		5.90	1.05
Financial intermediation, except insurance and pension funding	65		-3.18		5.92	-0.39
Insurance and pension funding, except compulsory social security	66		2.36		6.20	
Activities related to financial intermediation	67		3.00		5.30	
Real estate, renting and business activities	70-74	2.63	2.27		5.21	2.61
Real estate activities	70		2.94		5.52	2.54
Renting of m&eq and other business activities	71-74		1.87		4.82	2.67
Renting of machinery and equipment	71		1.16		4.57	
Computer and related activities	72		-0.61		4.75	
Research and development	73		2.32		4.59	2.50
Other business activities	74		2.55		4.86	
Community, social and personal services	**75-99**	3.02	2.22		4.45	2.61
Public admin. and defence; compulsory social security	75	2.83	2.27		4.03	2.16
Education	80	2.90	2.57		4.51	3.08
Health and social work	85	3.46	1.52		4.80	3.08
Other community, social and personal services	90-93	3.00	2.85		4.58	
Private households with employed persons	95	2.56	1.60			
Extra-territorial organisations and bodies	99		0.00			
Total services	**50-99**	2.60	1.62		4.90	2.03
Business services	**50-74**	2.38	1.36		5.10	1.76

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) Data for sectors 50, 51, 52, 60-63, 60, 61, 62, 63, 64, 65-67, 65, 66, 67, 70, 71-74, 71, 72, 73 and 74 refer to the period 1991-2002.
2) Data for all sectors refer to the period 1991-2002.
3) Data for sectors 60, 61, 62 and 63 refer to the period 1991-2002.
4) Data for sectors 60-63, 60, 61, 63 and 64 refer to the period 1991-2002.
5) Data for sectors 71, 73 and 74 refer to the period 1991-2001. Data for sectors 75-99 and 95 refer to the period 1991-2002.
6) Data for sectors 70 and 71-74 refer to the period 1991-2002.
7) Data for all sectors refer to the period 1991-2002.
8) The euro area aggregate does not include Greece and Ireland and for the sector 75-99 refers to the period 1991-2002.
9) Data for sector 01-99 refer to the period 1991-2002. Data for all other sectors refer to the period 1991-2001.

IE [2]	IT [3]	LU [4]	NL	AT	PT	FI [5]	DK	SE [6]	UK [7]	EA [8]	US [9]
2.44	3.42	3.52	2.44	1.77	4.70	1.77	2.04	2.08	2.40	2.10	2.12
-1.40	2.35	-0.38	1.28	1.01	3.80	0.05	1.70	-0.81	0.30	1.12	0.10
4.92	3.06	1.69	1.46	1.43	4.85	2.46	1.03		2.65	2.44	0.66
4.74	2.69	1.05	1.09	0.68	4.12	2.64	0.71	0.75	3.07	1.93	0.48
4.74	3.04	1.91	2.63	3.32		0.47	3.73				3.26
4.74	1.90	0.17	0.70	-0.33		4.00	0.12				-0.45
4.74	3.18	2.17	1.18	0.99		1.38	0.91				0.25
5.63	4.52	4.86	4.09	3.97	9.25	1.23	3.86		0.84	4.67	4.39
1.44	2.21	-1.67	0.58	1.09	4.17	1.83	0.53		4.85	0.41	0.76
3.11	3.12	-1.71	1.48	2.24		2.04	1.28		3.01		1.30
3.11	2.81	-1.71	2.25	2.68		2.05	2.65				1.71
3.11	3.68	-1.71	-0.46	-2.77		1.85	..				1.63
3.11	3.23		-1.56	-3.56		1.30	2.51				0.52
3.11	3.23	-1.71	2.34	2.91		2.34	2.87				1.14
-0.13	-0.04	-1.71	-1.03	-1.27		0.75	-1.31		8.04		0.27
	4.86	7.22	3.45	3.07	2.76	3.16	2.74	3.02	3.34	2.75	3.25
	2.28	9.57	5.72	1.95	-2.55	-0.66	3.49	-3.02	2.37	1.41	4.12
5.52	0.75	10.42	5.82	1.79		-0.92	3.01		2.83		4.95
5.43	12.14	4.73	6.22	2.52		-0.67	5.30		0.51		6.94
5.43	6.22	7.95	4.72	4.07		1.82	4.19		3.77		0.15
5.68	5.75	4.30	2.73	3.72	5.94	4.08	2.49	4.47	3.69	3.12	2.98
5.68	6.79	4.06	2.21	4.47		4.10	3.37	4.02	1.85		2.52
	4.48	4.60	3.00	2.79		4.04	1.16	5.88	5.14		3.63
5.68		1.45	1.75	1.53		1.63	..		3.83		0.24
5.68	4.00	5.48	2.49	1.45		4.60	-4.44		11.02		2.19
5.68			2.96	2.98		3.31	2.66		1.42		4.46
5.68	18.40	4.91	3.25	3.39		4.27	3.15		4.49		4.87
	4.00	3.81	3.61	2.49	7.85	3.09	2.84	4.10	2.10	2.94	3.77
5.49	3.66	4.03	2.82	2.36	6.63	3.06	2.75		-0.01	2.67	3.43
0.46	4.86	3.39	3.70	2.63	8.60	2.89	2.84		1.61	3.38	4.45
5.68	3.71	1.84	4.21	1.51	9.25	3.88	2.56		3.55	2.83	4.30
	3.78	6.35	3.88	3.89	7.54	2.62	3.77		3.59		3.94
5.68	4.35	6.74	3.96	3.60		2.08	2.34				3.28
4.57	3.86	4.45	2.76	2.21	5.23	2.72	2.17	3.07	2.96	2.49	2.55
4.77	3.83	4.64	2.31	2.09	3.84	2.63	1.82	2.38	3.39	2.30	2.04

Table A.7 Value added price changes (1996-2003)

(percentages)

		BE	DE [1]	GR	ES	FR
Grand total	**01-99**	1.55	0.38	4.46	3.26	1.34
Total manufacturing	**15-37**	-0.24	1.07	4.05	1.55	-1.02
Wholesale and retail trade; restaurants and hotels	**50-55**	2.62	1.25	3.15	4.13	1.32
Wholesale and retail trade; repairs	50-52	2.34	1.00	1.96	3.00	0.83
Sale, maintenance and repair of motor vehicles; retail sale of fuel	50		2.92	0.24	2.50	2.27
Wholesale, trade & commission excl. motor vehicles	51		-0.44	2.61	3.24	-0.85
Retail trade excl. motor vehicles; repair of household goods	52		2.28	2.44	3.06	2.11
Hotels and restaurants	55	4.81	3.84	5.37	5.85	3.62
Transport and storage and communication	**60-64**	1.07	-2.98	3.41	2.73	-1.02
Transport and storage	60-63		1.23	6.07	3.90	1.34
Land transport; transport via pipelines	60		2.01	4.65	3.32	0.75
Water transport	61		-6.16	7.76	3.11	-2.42
Air transport	62		0.45	4.56	3.48	0.54
Supporting and auxiliary transport activities	63		2.38	4.97	5.84	2.56
Post and telecommunications	64		-7.77	-0.46	0.44	-5.52
Finance, insurance, real estate and business services	**65-74**	1.93	0.10	4.96	4.44	2.26
Financial intermediation	65-67	2.30	-4.15	4.13	4.09	1.19
Financial intermediation, except insurance and pension funding	65		-7.81	3.46	4.12	-0.27
Insurance and pension funding, except compulsory social security	66		0.76	8.97	4.57	3.74
Activities related to financial intermediation	67		1.99	6.85	3.13	4.69
Real estate, renting and business activities	70-74	1.86	0.94	5.25	4.56	2.47
Real estate activities	70		1.15	5.40	5.03	2.08
Renting of m&eq and other business activities	71-74		0.80	4.76	4.01	2.85
Renting of machinery and equipment	71		-0.21	4.38	3.59	0.21
Computer and related activities	72		-2.75	0.12	3.88	1.99
Research and development	73		1.27	4.77	3.64	2.81
Other business activities	74		1.83	5.52	4.07	3.38
Community, social and personal services	**75-99**	2.48	1.05	6.05	3.45	2.50
Public admin. and defence; compulsory social security	75	2.27	1.12	6.30	3.07	2.17
Education	80	2.29	1.46	7.41	3.25	2.87
Health and social work	85	2.88	0.15	6.39	3.66	3.28
Other community, social and personal services	90-93	2.69	1.92	2.78	3.93	1.38
Private households with employed persons	95	2.56	1.54	7.20		-2.61
Extra-territorial organisations and bodies	99		0.00			
Total services	**50-99**	2.16	0.26	4.51	3.82	1.91
Business sector services	**50-74**	2.00	-0.08	3.92	3.99	1.60

Sources: OECD STAN database, GGDC database, NCBs and own calculations.
1) Data for sectors 50, 51, 52, 60-63, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71-74, 71, 72, 73 and 74 refer to the period 1996-2002.
2) Data for all sectors refer to the period 1996-2002.
3) Data for sectors 60, 61, 62 and 63 refer to the period 1996-2002.
4) Data for sectors 60-63, 60, 61, 62, 63 and 64 refer to the period 1996-2002.
5) Data for sectors 71, 73 and 74 refer to the period 1996-2001. Data for sectors 75-99 and 95 refer to the period 1996-2002.
6) Data for sectors 60-63, 60, 61, 62, 63, 64, 70, 71-74, 71, 72 and 73 refer to the period 1996-2002.
7) Data for all sectors refer to the period 1996-2002.
8) The euro area aggregate does not include Ireland and for the sector 75-99 refers to the period 1996-2002.
9) Data for sector 01-99 refer to the period 1996-2002. Data for all other sectors refer to the period 1996-2001.

IE [2]	IT [3]	LU [4]	NL	AT	PT	FI [5]	DK	SE [6]	UK [7]	EA [8]	US [9]
2.65	2.73	3.28	2.60	0.95	3.09	1.41	1.82	1.30	2.80	1.64	1.81
-2.07	1.90	0.81	1.28	0.46	1.13	-0.96	1.50	-2.62	0.20	0.87	-0.82
5.81	2.18	1.07	1.23	0.94	3.41	1.87	0.05	0.15	3.30	1.97	-0.58
5.57	1.86	0.65	0.76	0.27	2.86	1.88	-0.40	-0.20	3.51	1.42	-0.87
5.57	2.25	1.99	2.50	1.99		0.79	3.13				1.52
5.57	1.81	-0.40	0.25	-0.15		2.84	-1.51				-2.04
5.57	1.78	1.95	0.99	0.17		0.93	0.64				-0.57
6.75	3.37	3.26	4.63	3.10	6.42	1.80	4.07	2.82	2.46	4.37	5.37
1.41	1.04	-0.65	-0.32	0.77	2.54	2.14	-0.27	0.78	6.03	-0.38	0.10
4.22	1.99	-0.58	1.62	2.15		2.02	0.57	2.19	3.38		1.48
4.22	1.52	-0.58	2.07	2.26		2.16	1.75	2.70			2.68
4.22	1.67	-0.58	-0.60	-3.63		2.75	..	-4.95			2.25
4.22	1.77		-0.05	0.93		0.72	-1.34	5.25			-0.84
4.22	1.77	-0.58	2.28	2.95		1.88	2.65	2.84			0.75
-1.26	-0.89	-0.58	-3.99	-1.99		2.04	-2.24	-1.72	10.58		-1.16
	3.66	5.63	3.55	2.12	1.74	2.65	2.17	2.19	4.28	1.99	2.91
	1.92	7.29	5.92	2.16	-2.78	-4.27	1.48	-1.48	3.69	0.46	2.47
6.85	0.14	7.81	5.87	2.66		-4.15	0.88		4.05		4.33
7.34	11.95	6.17	6.99	1.24		-5.44	3.24		1.74		4.49
7.34	6.52	6.23	4.12	4.35		-1.94	3.85		5.68		-2.65
7.19	4.18	3.18	2.78	2.22	4.15	4.17	2.38	2.94	4.62	2.37	3.10
7.19	5.07	2.72	1.92	2.79		4.14	3.14	1.28	2.03		2.71
	3.24	3.75	3.29	1.51		4.20	1.35	6.26	6.70		3.60
7.19		0.97	1.19	-0.18		2.06	0.12	-3.16	5.55		-1.29
7.19	2.67	4.52	2.89	-1.18		4.31	-3.23	9.72	11.66		3.90
7.19			3.82	2.24		4.44	2.84	6.02	1.43		5.24
7.19	3.39	3.92	3.60	2.45		6.91	2.90		5.98		4.68
	3.81	3.54	3.90	1.05	5.86	3.01	3.04	4.39	1.91	2.47	3.37
6.87	4.36	3.59	2.68	1.43	4.78	3.28	3.07		0.45	2.45	3.04
-0.96	5.00	2.98	4.06	1.66	6.43	3.08	3.08		1.11	3.07	4.90
7.19	2.72	3.05	4.88	-0.98	6.79	3.75	2.63		3.08	2.32	3.36
	3.03	4.53	4.12	2.44	6.10	2.54	4.07		3.22	2.47	4.54
7.19	3.02	7.01	4.51	2.60		3.98	2.61				3.21
5.51	3.06	3.75	2.76	1.30	3.72	2.44	1.76	2.64	3.49	1.90	1.94
5.86	2.77	3.81	2.14	1.44	2.52	2.31	1.07	1.60	4.26	1.63	1.36

Table A.8 Weights of HICP services sub-components (2005)

(services = 100, except first two lines where all items = 100)

Code	Description	AT	BE	DE	ES
cp00	All items HICP	100.00	100.00	100.00	100.00
serv	Services (overall index excluding goods) (all items = 100)	46.49	37.51	44.05	38.08
serv	Services (overall index excluding goods) (services = 100)	100.00	100.00	100.00	100.00
servcomm	**Communication services**	**5.70**	**7.84**	**5.78**	**5.54**
cp081	Postal services	0.33	0.45	0.67	0.13
cp082_83	Telephone and telefax equipment and services	5.37	7.39	5.11	5.40
cp082	Telephone and telefax equipment	0.24	0.49	0.28	
cp083	Telephone and telefax services	5.13	6.91	4.83	
servhouse	**Housing services**	**19.12**	**24.07**	**33.24**	**18.48**
cp041	Actual rentals for housing	8.48	17.04	24.84	6.71
cp0432	Services for the maintenance and repair of the dwelling	1.62	1.69	1.23	3.15
cp0442	Refuse collection	0.55	0.32	1.70	
cp0443	Sewerage collection	0.74	0.03	2.38	
cp0444	Other services relating to the dwelling not elsewhere classified	5.97		1.46	
cp0513	Repair of furniture, furnishings and floor coverings			0.30	
cp0533	Repair of household appliances	0.29	0.54	0.29	0.23
cp0562	Domestic services and household services	0.85	3.15	0.57	2.73
cp1252	Insurance connected with the dwelling	0.63	1.30	0.48	0.52
servrp	**Recreation and personal services**	**47.58**	**45.19**	**27.69**	**55.52**
cp0314	Cleaning, repair and hire of clothing	0.24	0.36	0.32	
cp0915	Repair of audio-visual, photographic and information-processing equipment	0.23	0.33	0.31	0.15
cp0923	Maintenance and repair of other major durables for recreation and culture				
cp0941	Recreational and sporting services	3.30	1.74	1.85	1.69
cp0942	Cultural services	4.04	5.28	4.20	2.35
cp096	Package holidays	5.53	10.65	6.13	4.86
cp1111	Restaurants, cafés and the like	21.65	17.85	8.39	39.66
cp1112	Canteens	0.86	0.96	1.22	
cp112	Accommodation services	9.21	4.94	2.92	2.65
cp1211	Hairdressing salons and personal grooming establishments	2.53	3.09	2.33	3.22
servtrans	**Transportation services**	**14.03**	**10.70**	**16.67**	**9.90**
cp0723	Maintenance and repair of personal transport equipment	6.45	5.75	6.35	4.19
cp0724	Other services in respect of personal transport equipment	1.58	0.62	3.20	0.77
cp0731	Passenger transport by railway	0.49	1.07	1.35	0.39
cp0732	Passenger transport by road	0.76	0.61	0.52	1.68
cp0733	Passenger transport by air	1.62	0.33	0.74	0.78
cp0734	Passenger transport by sea and inland waterway			0.25	
cp0735	Combined passenger transport	1.48	0.41	2.30	
cp0736	Other purchased transport services	0.01	0.07	0.15	
cp1254	Insurance connected with transport	1.66	1.86	1.81	1.66
servmisc	**Miscellaneous services**	**13.56**	**12.21**	**16.62**	**10.57**
cp0621_623	Medical services; paramedical services	1.93	2.27	2.49	1.05
cp10	Education	2.10	1.38	1.79	4.72
cp124	Social protection	1.28	0.79	2.91	0.70
cp1253	Insurance connected with health	1.34	1.78	2.47	0.37
cp1255	Other insurance	0.54	0.25	1.69	0.59
cp126	Financial services not elsewhere classified	0.79	0.80	1.06	0.09
cp127	Other services not elsewhere classified	1.18	2.84	0.98	1.27
cp0622	Dental services	1.73	0.43	1.47	1.56
cp063	Hospital services	2.68	1.67	1.76	0.24

Sources: European Commission and own calculations.

Countries											
FI	FR	GR	IE	IT	LU	NL	PT	euro area	SE	UK	DK
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
40.99	38.90	39.08	46.18	40.00	30.45	42.96	38.14	41.00	39.51	46.40	39.39
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
7.55	**8.12**	**5.93**	**4.33**	**7.99**	**5.75**	**8.46**	**7.77**	**6.88**	**9.83**	**5.39**	**5.48**
0.38	0.62	0.06	0.21	0.77	0.36	0.38	0.09	0.55	0.58	0.43	0.37
7.17	7.49	5.87	4.12	7.23	5.39	8.08	7.69	6.33	9.25	4.96	5.11
0.29	0.51	0.04		1.47	0.92		0.15	0.50			0.16
6.88	6.98	5.83		5.76	4.47		7.54	5.33			4.96
28.75	**28.39**	**15.16**	**10.24**	**17.82**	**21.61**	**24.42**	**15.11**	**25.30**	**27.96**	**14.44**	**31.04**
19.33	17.02	8.44	5.49	6.86	11.36	17.35	5.29	15.56	25.28	10.13	20.27
0.91	3.44	2.01	2.27	2.90	1.41	1.03	3.80	2.28		1.72	2.38
0.31	0.99	1.25	0.23	1.64	1.02	1.55	0.05	1.23	0.78		2.27
0.93	1.23	0.32	0.23	0.26	0.43	0.78	0.24	1.15	0.68	1.08	1.67
5.83	1.25	1.23	0.02	1.08	1.08	0.55	0.76	1.78	0.18		1.18
0.39	0.34			0.62		0.33	0.20	0.30			0.15
0.28	0.20	0.18	0.27	0.55	0.53	0.04	0.22	0.30	0.05	0.22	0.27
0.44	2.67	1.68	1.39	3.90	5.35	2.30	4.33	2.14	0.38	1.08	1.67
0.33	1.25	0.05	0.35		0.43	0.49	0.23	0.56	0.60	0.22	1.20
34.57	**30.41**	**44.88**	**63.41**	**38.77**	**42.86**	**28.50**	**47.48**	**36.05**	**33.07**	**45.47**	**29.70**
0.20	0.41	0.84	0.39	0.92	0.49	0.34	0.09	0.44	0.14	0.22	0.27
0.32	0.43	0.16		0.06	0.39	0.08	0.09	0.24	0.23	0.22	0.23
					0.03	0.05	0.01	0.00	0.20		
2.67	2.85	0.50	2.93	3.53	1.48	3.86	1.28	2.49	3.98	1.94	1.75
4.01	4.26	3.33	5.57	1.67	3.19	1.48	2.29	3.38	4.25	5.17	5.21
3.92	0.79	0.67	7.76	0.81	4.96	4.13	1.37	3.71	5.42	6.25	2.56
15.94	11.97	33.39	37.87	18.80	21.74	12.96	29.12	17.02	12.11	23.28	13.56
3.37	3.68	1.94	1.58	2.08	0.79	1.50	2.88	1.90	1.53	2.80	1.45
1.83	3.25	2.80	5.45	7.37	6.14	1.75	8.28	4.14	1.97	3.88	1.93
2.33	2.77	1.25	1.85	3.53	3.65	2.36	2.06	2.73	3.22	1.72	2.74
13.40	**15.70**	**11.60**	**7.84**	**20.62**	**15.63**	**11.55**	**12.91**	**15.56**	**14.27**	**14.44**	**16.49**
2.95	5.95	1.81	1.45	9.18	7.26	5.44	5.30	6.24	4.83	5.17	6.41
1.56	2.62	1.12	1.26	2.81	2.30	1.27	1.89	2.38	1.97	1.29	2.72
1.44	1.28	0.19	0.69	0.65	0.59	1.10	0.31	0.99	1.26	1.72	1.61
3.82	1.51	4.50	2.97	0.83	0.79	1.25	1.30	1.16	0.96	3.02	1.31
1.59	1.84	1.25	0.86	2.00	1.31	1.17	0.50	1.26	0.96	1.72	0.97
1.05	0.11	1.10	0.10	0.39	0.36	0.09	0.04	0.23	0.28	0.43	0.55
	0.62	1.21	0.03	1.38	0.66		1.60	1.27	2.88		0.73
	0.22	0.20	0.03	0.29	0.03	0.10	0.02	0.16	0.09		0.21
0.98	1.56	0.22	0.45	3.08	2.33	1.12	1.94	1.87	1.04	1.08	1.97
15.73	**17.38**	**22.44**	**14.18**	**14.79**	**14.15**	**27.07**	**16.73**	**16.20**	**14.87**	**20.26**	**17.29**
2.70	2.58	5.76	1.54	2.10	0.36	3.11	4.51	2.40	1.25	0.43	0.92
1.80	1.34	5.02	4.19	2.78	1.35	1.61	4.08	2.35	0.86	3.66	2.76
4.52	3.28	0.12	2.45	1.35	7.03	4.66	1.62	2.36	3.15	2.80	5.16
0.15	2.14	0.88	1.95		0.43	2.15	0.08	1.50	0.48	0.43	1.69
					0.33	0.16	0.03	0.62			
2.27	1.61	0.41	0.13	2.45	0.72	2.87	2.70	1.43	4.70	5.60	2.50
1.01	3.39	3.06	1.31	3.55	3.61	7.06	1.49	2.43	0.95	5.17	0.95
1.39	1.75	5.31	0.64	1.78	0.10	0.94	1.54	1.63	3.21	0.43	2.41
1.88	1.29	1.87	1.96	0.78	0.23	4.51	0.69	1.49	0.26	1.72	0.90

Table A.9 Average inflation rate of the HICP services sub-components (period 1996/01[1)]-2005/7)

(geometric average of year-on-year percentage changes)

Code	Description	AT	BE	DE	ES
cp00	All items HICP	1.54	1.75	1.30	2.86
serv	Services (overall index excluding goods)	2.37	2.11	1.55	3.73
	Difference between all items and services inflation	0.83	0.36	0.25	0.88
servcomm	**Communication services**	**-1.46**	**-0.33**	**-3.01**	**-0.97**
cp081	Postal services	3.82	2.45	1.36	7.30
cp082_83	Telephone and telefax equipment and services	-1.84	-0.51	-3.71	-1.14
cp082	Telephone and telefax equipment	-14.17	-6.52	-8.92	-
cp083	Telephone and telefax services	-1.81	-0.18	-3.48	-
servhouse	**Housing services**	**3.12**	**2.37**	**1.63**	**4.38**
cp041	Actual rentals for housing	3.43	1.87	1.48	4.80
cp0432	Services for the maintenance and repair of the dwelling	2.22	2.59	0.41	4.43
cp0442	Refuse collection	3.92	-1.35	3.58	-
cp0443	Sewerage collection	2.39	7.11	2.38	-
cp0444	Other services relating to the dwelling not elsewhere classified	2.34	-	1.69	-
cp0513	Repair of furniture, furnishings and floor coverings	-	-	0.82	3.04
cp0533	Repair of household appliances	3.14	2.92	2.74	3.14
cp0562	Domestic services and household services	1.71	2.16	1.80	4.40
cp1252	Insurance connected with the dwelling	0.95	2.68	0.93	4.76
servrp	**Recreation and personal services**	**2.23**	**2.14**	**1.73**	**4.04**
cp0314	Cleaning, repair and hire of clothing	1.77	2.23	1.44	-0.15
cp0915	Repair of audio-visual, photographic and information-processing equipment	2.51	2.75	1.85	2.35
cp0923	Maintenance and repair of other major durables for recreation and culture	-	-	-	-
cp0941	Recreational and sporting services	2.37	2.73	2.89	3.41
cp0942	Cultural services	2.15	-0.93	2.37	2.36
cp096	Package holidays	1.60	2.78	1.25	8.15
cp1111	Restaurants, cafés and the like	2.07	2.29	1.41	3.92
cp1112	Canteens	2.49	2.71	1.84	4.15
cp112	Accommodation services	2.82	2.99	1.28	5.56
cp1211	Hairdressing salons and personal grooming establishments	2.62	2.51	1.94	3.33
servtrans	**Transportation services**	**2.68**	**2.68**	**1.80**	**3.86**
cp0723	Maintenance and repair of personal transport equipment	2.98	4.21	2.00	3.73
cp0724	Other services in respect of personal transport equipment	4.61	3.05	1.04	2.67
cp0731	Passenger transport by railway	3.11	2.39	2.48	2.80
cp0732	Passenger transport by road	1.99	0.12	2.38	4.41
cp0733	Passenger transport by air	-2.50	-2.18	2.54	7.32
cp0734	Passenger transport by sea and inland waterway	-	-	0.29	5.30
cp0735	Combined passenger transport	3.68	1.57	3.27	-
cp0736	Other purchased transport services	0.42	-	0.60	-
cp1254	Insurance connected with transport	1.43	0.29	0.23	3.95
servmisc	**Miscellaneous services**	**3.90**	**1.98**	**3.09**	**3.52**
cp0621_623	Medical services; paramedical services	3.06	2.71	5.03	4.18
cp10	Education	6.09	1.91	3.18	3.99
cp124	Social protection	3.36	0.60	3.51	5.00
cp1253	Insurance connected with health	3.58	3.85	3.30	4.03
cp1255	Other insurance	3.93	1.39	2.71	4.87
cp126	Financial services not elsewhere classified	2.82	4.19	2.64	5.36
cp127	Other services not elsewhere classified	4.67	1.53	2.25	2.80
cp0622	Dental services	2.74	1.98	3.41	2.99
cp063	Hospital services	3.23	1.92	6.61	4.51

Sources: European Commission and own calculations.
1) Or first available month.

Countries											
FI	FR	GR	IE	IT	LU	NL	PT	euro area	SE	UK	DK
1.50	1.64	4.05	3.07	2.44	2.14	2.37	2.81	1.89	1.44	1.49	1.93
2.38	1.91	5.23	4.48	3.02	2.44	3.07	4.23	2.32	2.21	3.65	2.97
0.88	0.27	1.18	1.41	0.59	0.30	0.70	1.42	0.44	0.76	2.16	1.04
-2.00	**-1.85**	**-2.22**	**-2.53**	**-1.92**	**-3.85**	**-0.41**	**-0.85**	**-2.17**	**-1.02**	**-2.23**	**-2.21**
3.80	1.67	8.69	2.17	2.60	3.43	1.58	2.76	2.04	5.82	1.95	2.09
-2.42	-2.25	-2.43	-2.87	-2.42	-4.51	-0.54	-0.87	-2.62	-1.81	-2.59	-2.53
-19.26	-11.49	-6.52	-	-6.87	-7.36	-	-15.01	-9.10	-	-	-22.88
-1.13	-2.00	-3.81	-	-1.09	-3.60	-	-0.76	-2.90	-	-	-1.76
2.85	**2.07**	**5.81**	**4.96**	**3.60**	**2.91**	**3.39**	**4.42**	**2.43**	**2.12**	**3.53**	**3.23**
2.87	1.88	5.69	4.70	3.91	2.62	3.24	2.65	2.13	1.99	2.82	2.49
2.58	1.81	5.74	3.42	2.63	3.56	3.82	5.08	2.30	-	6.35	2.89
4.12	2.75	7.16	24.06	3.43	1.62	4.35	6.99	3.56	5.17	-	5.68
2.57	2.48	4.33	24.06	10.14	4.60	5.53	6.99	2.94	2.00	2.81	4.85
2.98	2.53	5.13	12.23	3.40	3.25	4.72	3.65	2.76	3.58	-	7.17
1.30	2.96	-	1.93	3.04	-	4.41	5.77	2.35	-	-	3.88
3.25	2.87	3.16	4.94	3.04	4.12	2.89	5.53	2.94	3.89	4.68	3.22
3.20	2.88	6.66	7.04	2.94	3.54	3.83	5.25	3.19	3.07	5.48	7.91
2.69	2.08	1.66	3.14	-	2.30	0.76	-	1.93	2.78	3.31	4.25
2.46	**2.23**	**5.91**	**4.65**	**3.21**	**2.56**	**2.82**	**3.93**	**2.68**	**2.41**	**3.70**	**3.09**
3.14	1.38	4.82	5.47	1.93	2.64	3.70	2.55	1.84	2.17	3.45	2.26
2.00	1.90	1.99	-2.83	2.36	1.45	5.63	5.31	2.41	2.51	4.72	1.45
-	-	-	-1.27	-	0.80	3.53	5.31	3.49	4.63	-	-
2.93	2.78	5.06	6.13	3.43	2.42	4.13	6.60	3.19	2.79	3.96	3.14
2.55	1.59	4.18	4.98	1.94	2.75	0.39	3.41	1.89	2.18	2.76	3.38
2.84	2.31	5.25	2.85	3.93	2.53	2.07	2.20	2.36	2.11	5.04	2.61
1.99	2.31	5.94	4.67	3.07	2.47	3.18	3.78	2.76	2.06	3.16	2.39
3.07	1.90	5.88	4.08	1.60	2.12	3.53	3.74	2.24	2.33	4.50	2.62
3.48	3.09	8.22	4.98	4.64	3.44	3.24	3.91	3.43	4.51	4.46	3.52
2.36	1.86	7.12	7.39	2.63	2.56	3.77	5.61	2.51	3.48	5.21	4.48
3.02	**2.21**	**6.29**	**4.34**	**3.70**	**3.10**	**2.69**	**6.12**	**2.64**	**4.20**	**4.60**	**3.47**
3.53	3.26	5.37	4.89	3.55	3.52	2.28	7.49	3.02	4.56	5.74	4.08
1.73	2.11	8.42	5.84	2.55	4.12	4.32	3.55	1.88	4.19	4.38	2.88
3.61	1.83	2.52	3.86	1.80	2.68	3.09	5.48	2.40	4.78	3.03	3.76
3.30	1.61	4.49	3.97	2.67	3.04	3.37	3.96	2.72	3.30	4.42	2.73
1.79	1.75	4.96	3.42	3.28	3.40	2.84	3.16	2.68	0.55	1.28	2.22
2.86	2.58	7.37	3.10	3.90	0.00	2.97	3.21	2.44	3.79	3.72	1.07
2.20	2.64	7.09	2.77	3.26	2.71	2.25	3.57	3.20	4.31	-	4.19
3.49	1.63	3.28	4.81	2.96	1.18	2.53	3.77	2.02	3.00	-	3.38
3.55	-0.71	8.54	4.11	9.05	1.21	1.97	-	1.79	7.26	7.04	5.76
4.00	**1.79**	**5.44**	**6.59**	**3.42**	**2.61**	**4.41**	**4.63**	**3.01**	**3.38**	**5.28**	**3.50**
5.66	3.67	5.67	8.16	3.03	3.23	7.97	5.28	4.55	3.42	2.54	3.02
3.75	1.90	5.23	6.33	2.43	3.37	2.99	5.40	2.96	-1.29	5.56	4.93
3.49	2.95	3.82	10.59	2.51	2.90	3.83	4.90	3.36	-3.72	5.92	4.23
4.78	3.56	2.22	8.95	-	2.45	9.87	-	3.87	7.63	7.79	4.00
-	-	-	8.66	-	2.85	2.27	-	2.86	-	-	-
7.25	1.69	0.97	4.47	6.93	5.81	4.35	3.73	3.49	6.75	-3.64	3.90
2.09	1.41	5.20	3.79	2.99	1.99	4.54	3.64	2.39	3.86	6.36	3.03
0.63	-2.77	4.45	7.35	3.38	-21.17	8.46	4.96	2.48	7.00	4.10	3.88
1.51	4.88	3.51	13.33	2.11	3.47	4.89	3.33	4.99	3.30	6.75	2.83

Table A.10 Average inflation rate of the HICP services sub-components (period 1996/01[1)]-2000/12)

(geometric average of year-on-year percentage changes)

Code	Description	AT	BE	DE	ES
cp00	All items HICP	1.25	1.60	1.07	2.58
serv	Services (overall index excluding goods)	2.15	2.07	1.40	3.56
	Difference between all items and services inflation	0.90	0.47	0.33	0.98
servcomm	**Communication services**	**-1.25**	**0.38**	**-4.75**	**-0.22**
cp081	Postal services	4.60	1.23	1.78	7.22
cp082_83	Telephone and telefax equipment and services	-1.75	0.33	-5.84	-0.43
cp082	Telephone and telefax equipment	-19.78	-5.37	-10.99	-
cp083	Telephone and telefax services	-2.06	0.49	-5.73	-
servhouse	**Housing services**	**3.05**	**2.46**	**2.04**	**4.36**
cp041	Actual rentals for housing	3.44	1.69	1.83	5.38
cp0432	Services for the maintenance and repair of the dwelling	2.34	2.31	0.43	4.02
cp0442	Refuse collection	1.78	-1.91	5.09	-
cp0443	Sewerage collection	2.06	-	2.71	-
cp0444	Other services relating to the dwelling not elsewhere classified	0.90	-	2.04	-
cp0513	Repair of furniture, furnishings and floor coverings	-	-	1.01	3.04
cp0533	Repair of household appliances	2.79	2.81	3.06	2.93
cp0562	Domestic services and household services	2.27	1.47	1.78	4.50
cp1252	Insurance connected with the dwelling	1.41	2.04	0.91	4.36
servrp	**Recreation and personal services**	1.91	2.04	1.75	3.75
cp0314	Cleaning, repair and hire of clothing	1.88	1.84	1.67	-0.15
cp0915	Repair of audio-visual, photographic and information-processing equipment	3.59	1.79	1.54	2.53
cp0923	Maintenance and repair of other major durables for recreation and culture	-	-	-	-
cp0941	Recreational and sporting services	1.84	2.27	2.74	2.56
cp0942	Cultural services	1.81	1.40	2.72	2.03
cp096	Package holidays	1.28	2.42	1.27	11.22
cp1111	Restaurants, cafés and the like	1.74	1.71	1.24	3.34
cp1112	Canteens	2.65	2.64	1.69	4.15
cp112	Accommodation services	2.51	2.32	0.81	6.86
cp1211	Hairdressing salons and personal grooming establishments	2.06	1.89	2.37	2.83
servtrans	**Transportation services**	**2.78**	**2.32**	**1.73**	**3.02**
cp0723	Maintenance and repair of personal transport equipment	2.89	3.25	1.75	2.75
cp0724	Other services in respect of personal transport equipment	3.82	5.02	1.26	0.70
cp0731	Passenger transport by railway	3.13	1.95	2.86	2.39
cp0732	Passenger transport by road	1.73	1.44	1.88	3.92
cp0733	Passenger transport by air	-	3.31	0.90	5.49
cp0734	Passenger transport by sea and inland waterway	-	-	1.18	5.30
cp0735	Combined passenger transport	4.16	2.07	3.14	-
cp0736	Other purchased transport services	3.23	-	0.42	-
cp1254	Insurance connected with transport	-0.63	-0.54	0.55	4.13
servmisc	**Miscellaneous services**	**3.83**	**1.46**	**2.60**	**3.26**
cp0621_623	Medical services; paramedical services	-	-	-	-
cp10	Education	4.24	-	3.92	3.78
cp124	Social protection	-	-	-	-
cp1253	Insurance connected with health	-	-	-	-
cp1255	Other insurance	-	-	-	-
cp126	Financial services not elsewhere classified	3.75	1.81	1.09	8.66
cp127	Other services not elsewhere classified	5.50	1.03	2.97	3.05
cp0622	Dental services	-	-	-	-
cp063	Hospital services	-	-	-	-

Sources: European Commission and own calculations.
1) Or first available month.

Countries											
FI	FR	GR	IE	IT	LU	NL	PT	euro area	SE	UK	DK
1.58	1.28	4.56	2.64	2.42	1.66	1.89	2.40	1.61	1.10	1.60	2.02
2.30	1.39	6.34	3.54	3.08	1.92	2.33	3.99	2.03	1.97	3.56	2.76
0.73	0.11	1.78	0.90	0.66	0.27	0.44	1.59	0.42	0.87	1.96	0.73
-1.06	**-2.73**	**-1.05**	**-4.35**	**-0.71**	**-2.58**	**-0.32**	**-0.92**	**-2.51**	**-0.59**	**-2.80**	**-2.07**
5.05	0.38	10.31	-0.14	3.08	3.06	1.75	3.21	2.21	6.85	1.72	0.75
-1.66	-3.15	-1.26	-4.72	-1.40	-3.15	-0.55	-0.94	-3.11	-1.73	-3.23	-2.31
-14.41	-10.69	-	-	-2.09	-3.73	-	-15.07	-7.35	-	-	-
-0.16	-3.00	-	-	-1.35	-2.63	-	-0.92	-4.55	-	-	-
2.67	**1.20**	**7.14**	**4.61**	**4.42**	**2.89**	**3.46**	**4.54**	**2.56**	**1.64**	**3.75**	**2.96**
2.85	1.30	6.50	5.83	5.19	2.89	3.54	2.64	2.36	1.57	3.13	2.34
2.37	-0.36	7.73	1.64	2.59	2.39	3.25	4.89	1.59	-	6.81	3.01
2.79	-	9.52	-	3.20	0.26	3.60	5.99	4.30	3.58	-	6.95
2.81	-	2.98	-	17.72	1.78	7.70	5.99	3.42	1.79	1.72	5.80
2.54	2.07	7.67	-	3.79	-	3.90	2.82	2.53	3.44	-	5.25
0.25	2.05	-	2.50	2.82	-	3.02	6.43	2.21	-	-	3.69
2.67	2.86	2.98	5.19	3.47	1.11	0.92	6.15	3.07	3.42	6.23	3.67
3.09	1.71	8.93	9.41	3.32	3.95	3.26	5.69	3.07	-	5.06	4.97
1.93	0.70	1.34	0.69	-	0.94	0.58	-	1.34	0.42	2.55	2.33
2.25	1.69	6.87	3.90	2.89	1.80	1.78	3.43	2.28	2.08	3.79	3.38
2.45	0.55	6.51	4.15	1.60	-0.16	3.37	2.34	1.53	2.41	3.37	3.00
2.38	1.84	1.48	-1.94	3.40	0.80	4.37	7.08	2.45	3.62	4.55	-
-	-	-	-1.74	-	0.66	2.21	7.08	2.27	-	-	-
2.20	2.33	5.68	5.31	2.98	1.48	3.50	7.31	2.79	1.37	4.57	-
1.43	1.36	5.45	3.40	1.94	2.42	-3.94	3.41	1.78	2.21	1.93	-
2.76	1.73	4.94	2.63	3.20	2.16	1.59	1.86	2.07	2.63	5.10	3.13
2.11	1.57	7.02	3.85	2.49	1.62	2.41	3.01	2.17	1.35	3.36	2.28
3.10	1.76	5.80	3.35	1.04	1.44	3.01	2.18	2.00	1.55	4.82	-
3.05	2.51	9.27	4.95	5.09	3.30	2.67	3.86	3.26	5.56	4.32	4.12
1.85	1.30	7.00	6.89	2.55	1.79	3.08	6.04	2.40	3.25	5.64	4.94
2.92	**1.40**	**7.72**	**3.57**	**3.35**	**1.60**	**1.40**	**6.33**	**2.23**	**3.30**	**4.53**	**3.07**
2.24	2.05	5.77	4.23	3.42	2.17	0.24	7.73	2.49	3.35	4.83	4.42
1.38	1.78	11.99	4.27	2.37	0.82	3.15	3.46	1.69	4.43	4.02	3.52
4.10	0.67	2.66	2.84	1.82	2.31	2.39	3.95	2.30	4.44	2.96	4.03
2.71	1.53	4.00	3.51	2.68	1.34	2.46	3.35	2.57	3.13	4.25	0.76
4.25	1.13	5.14	2.99	-0.55	2.55	1.70	5.13	1.26	2.58	2.77	2.20
1.85	3.72	7.85	2.79	3.59	-	4.89	3.29	2.45	3.41	4.79	0.65
1.74	2.34	9.87	1.61	2.98	1.63	2.25	2.99	3.05	2.73	-	1.64
3.13	1.57	2.83	2.91	3.58	1.08	2.72	3.19	2.20	2.55	-	4.18
4.34	-2.41	11.28	4.12	11.65	0.00	1.19	-	1.09	3.66	10.92	2.65
4.65	**1.04**	**6.46**	**4.98**	**3.19**	**2.58**	**3.33**	**4.02**	**2.47**	**5.13**	**4.98**	**2.52**
-	-	-	9.48	-	-	3.18	-	-	0.68	-	-
3.02	1.25	6.22	4.94	2.04	2.69	2.62	4.19	2.53	2.46	5.28	2.35
-	-	-	22.18	-	-	2.10	-	-	2.48	-	-
-	-	-	6.89	-	-	9.52	-	-	4.11	-	-
-	-	-	5.52	-	-	2.20	-	-	-	-	-
8.87	1.80	-	3.18	5.73	9.31	0.87	4.72	2.46	10.57	-2.30	2.62
2.57	0.74	6.48	4.09	3.16	0.64	4.55	1.82	2.28	3.78	5.06	3.28
-	-	-	7.06	-	-	4.20	-	-	8.60	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Table A.11 Average inflation rate of the HICP services sub-components (period 2001/01- 2005/7)

(geometric average of year-on-year percentage changes)

Code	Description	AT	BE	DE	ES
cp00	All items HICP	1.86	1.92	1.54	3.16
serv	Services (overall index excluding goods)	2.61	2.15	1.71	3.92
	Difference between all items and services inflation	0.75	0.24	0.17	0.76
servcomm	Communication services	-1.69	-1.11	-1.08	-1.78
cp081	Postal services	2.97	3.80	0.89	7.38
cp082_83	Telephone and telefax equipment and services	-1.94	-1.42	-1.32	-1.89
cp082	Telephone and telefax equipment	-8.95	-7.76	-6.61	-
cp083	Telephone and telefax services	-1.60	-0.92	-0.97	-
servhouse	Housing services	3.19	2.28	1.19	4.41
cp041	Actual rentals for housing	3.42	2.08	1.09	4.18
cp0432	Services for the maintenance and repair of the dwelling	2.09	2.89	0.39	4.87
cp0442	Refuse collection	5.82	-1.22	1.96	-
cp0443	Sewerage collection	2.69	7.11	2.02	-
cp0444	Other services relating to the dwelling not elsewhere classified	3.62	-	1.30	-
cp0513	Repair of furniture, furnishings and floor coverings	-	-	0.60	-
cp0533	Repair of household appliances	3.52	3.03	2.39	3.36
cp0562	Domestic services and household services	1.10	2.92	1.82	4.29
cp1252	Insurance connected with the dwelling	0.45	3.39	0.96	5.20
servrp	Recreation and personal services	2.58	2.24	1.72	4.37
cp0314	Cleaning, repair and hire of clothing	1.64	2.64	1.19	-
cp0915	Repair of audio-visual, photographic and information-processing equipment	1.57	3.81	2.19	2.16
cp0923	Maintenance and repair of other major durables for recreation and culture	-	-	-	-
cp0941	Recreational and sporting services	2.83	3.24	3.05	4.35
cp0942	Cultural services	2.52	-3.41	1.98	2.72
cp096	Package holidays	1.94	3.17	1.22	4.91
cp1111	Restaurants, cafés and the like	2.43	2.93	1.60	4.55
cp1112	Canteens	2.31	2.79	2.00	-
cp112	Accommodation services	3.16	3.74	1.81	4.15
cp1211	Hairdressing salons and personal grooming establishments	3.24	3.18	1.48	3.87
servtrans	Transportation services	2.57	3.07	1.88	4.79
cp0723	Maintenance and repair of personal transport equipment	3.07	5.26	2.27	4.81
cp0724	Other services in respect of personal transport equipment	5.47	0.94	0.80	4.87
cp0731	Passenger transport by railway	3.09	2.87	2.08	3.24
cp0732	Passenger transport by road	2.28	-1.30	2.93	4.95
cp0733	Passenger transport by air	-2.50	-3.43	4.36	9.35
cp0734	Passenger transport by sea and inland waterway	-	-	-0.68	-
cp0735	Combined passenger transport	3.16	1.02	3.42	-
cp0736	Other purchased transport services	-1.97	-	0.79	-
cp1254	Insurance connected with transport	3.73	1.21	-0.12	3.76
servmisc	Miscellaneous services	3.99	2.54	3.64	3.80
cp0621_623	Medical services; paramedical services	3.06	2.71	5.03	4.18
cp10	Education	8.16	1.91	2.37	4.22
cp124	Social protection	3.36	0.60	3.51	5.00
cp1253	Insurance connected with health	3.58	3.85	3.30	4.03
cp1255	Other insurance	3.93	1.39	2.71	4.87
cp126	Financial services not elsewhere classified	2.02	6.85	4.36	1.87
cp127	Other services not elsewhere classified	3.77	2.07	1.48	2.52
cp0622	Dental services	2.74	1.98	3.41	2.99
cp063	Hospital services	3.23	1.92	6.61	4.51

Sources: European Commission and own calculations.

Countries											
FI	FR	GR	IE	IT	LU	NL	PT	euro area	SE	UK	DK
1.41	2.03	3.50	3.54	2.46	2.67	2.91	3.25	2.18	1.82	1.37	1.82
2.46	2.48	4.04	5.51	2.96	3.01	3.89	4.49	2.64	2.46	3.73	3.20
1.05	0.45	0.55	1.97	0.50	0.34	0.98	1.24	0.46	0.64	2.35	1.37
-3.01	**-1.08**	**-3.48**	**-0.50**	**-3.23**	**-5.21**	**-0.51**	**-0.76**	**-1.79**	**-1.48**	**-1.73**	**-2.36**
2.46	2.81	6.96	4.76	2.09	3.83	1.39	2.27	1.86	4.71	2.15	3.57
-3.25	-1.45	-3.69	-0.80	-3.52	-5.98	-0.53	-0.79	-2.08	-1.91	-2.03	-2.77
-24.24	-12.18	-6.52	-	-10.85	-11.17	-	-14.99	-10.60	-	-	-22.88
-2.18	-1.12	-3.81	-	-0.80	-4.65	-	-0.58	-1.43	-	-	-1.76
3.05	**2.83**	**4.37**	**5.35**	**2.72**	**2.94**	**3.30**	**4.29**	**2.29**	**2.65**	**3.33**	**3.52**
2.89	2.40	4.82	3.48	2.53	2.33	2.91	2.67	1.88	2.44	2.55	2.66
2.82	3.74	3.62	5.41	2.68	4.59	4.45	5.29	3.07	-	5.94	2.75
5.59	2.75	4.63	24.06	3.62	3.13	4.51	8.10	2.91	6.94	-	4.31
2.31	2.48	5.83	24.06	3.93	7.76	5.06	8.10	2.51	2.23	3.77	3.83
3.47	2.94	2.42	12.23	3.05	3.25	5.06	4.55	2.96	3.74	-	9.30
2.45	3.76	-	1.32	3.09	-	5.64	5.05	2.51	-	-	4.10
3.88	2.88	3.36	4.68	2.57	6.82	5.09	4.87	2.80	4.40	3.35	2.74
3.31	3.92	4.23	4.52	2.52	3.11	4.45	4.77	3.33	3.07	5.85	11.21
3.52	3.30	2.00	5.88	-	3.50	0.95	-	2.58	5.43	3.98	6.40
2.69	**2.71**	**4.87**	**5.49**	**3.55**	**3.41**	**3.97**	**4.48**	**3.12**	**2.76**	**3.62**	**2.77**
3.91	2.11	3.01	6.92	2.30	5.78	4.06	2.78	2.17	1.92	3.52	1.46
1.58	1.94	2.55	-3.79	1.24	2.17	7.03	3.41	2.36	1.32	4.87	1.45
-	-	-	-0.77	-	0.94	4.99	3.41	4.83	4.63	-	-
3.72	3.18	4.40	7.03	3.92	3.46	4.83	5.83	3.62	4.36	3.43	3.14
3.78	1.78	2.80	6.74	1.94	3.11	5.35	3.40	2.01	2.14	3.49	3.38
2.92	2.82	5.59	3.09	4.57	2.94	2.60	2.57	2.68	1.54	4.98	2.05
1.87	2.96	4.77	5.58	3.72	3.41	4.01	4.62	3.41	2.83	2.99	2.50
3.03	2.03	5.96	4.88	2.10	2.86	4.11	5.46	2.46	3.18	4.22	2.62
3.95	3.60	7.07	5.02	4.16	3.58	3.87	3.97	3.61	3.38	4.59	2.87
2.91	2.34	7.25	7.94	2.72	3.40	4.53	5.14	2.64	3.74	4.84	3.97
3.13	**2.92**	**4.75**	**5.19**	**4.08**	**4.76**	**4.13**	**5.90**	**3.09**	**5.19**	**4.66**	**3.91**
4.95	4.33	4.93	5.61	3.69	5.03	4.54	7.22	3.60	5.90	6.54	3.71
2.11	2.41	4.66	7.57	2.74	7.84	5.62	3.65	2.08	3.94	4.70	2.19
3.08	2.86	2.36	4.99	1.78	3.09	3.85	7.17	2.51	5.15	3.10	3.47
3.94	1.67	5.02	4.47	2.66	4.93	4.37	4.64	2.89	3.49	4.58	4.92
-0.83	2.29	4.77	3.89	7.63	4.32	4.10	1.06	4.25	-1.63	0.00	2.24
3.97	1.59	6.85	3.45	4.23	0.00	0.92	3.13	2.43	4.21	2.80	1.53
4.50	2.90	4.15	4.06	3.55	3.91	-	4.20	3.38	6.06	-	7.03
5.28	1.68	3.77	6.92	2.28	1.27	2.32	4.41	1.83	3.51	-	2.52
2.69	0.81	5.63	4.09	6.27	2.54	2.83	-	2.56	11.32	3.76	9.27
3.30	**2.46**	**4.33**	**8.38**	**3.67**	**2.64**	**5.60**	**5.29**	**3.61**	**1.50**	**5.54**	**4.58**
5.66	3.67	5.67	7.87	3.03	3.23	9.04	5.28	4.55	4.03	2.54	3.02
4.54	2.61	4.16	7.87	2.85	4.11	3.39	6.75	3.44	-5.23	5.87	7.81
3.49	2.95	3.82	8.21	2.51	2.90	4.21	4.90	3.36	-5.03	5.92	4.23
4.78	3.56	2.22	9.40	-	2.45	9.94	-	3.87	8.42	7.79	4.00
-	-	-	9.36	-	2.85	2.28	-	2.86	-	-	-
5.51	1.59	0.97	5.91	8.25	2.11	8.27	2.65	4.61	2.74	-4.79	5.32
1.57	1.99	3.82	3.47	2.81	3.48	4.53	5.67	2.51	3.95	7.51	2.76
0.63	-2.77	4.45	7.42	3.38	-21.17	9.42	4.96	2.48	6.65	4.10	3.88
1.51	4.88	3.51	13.33	2.11	3.47	4.89	3.33	4.99	3.30	6.75	2.83

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