

High Employment with Low Productivity? The Service Sector as a Determinant of Economic Development

Andreas Breitenfellner,
Antje Hildebrandt

Whether measured in terms of employment or value added, the service sector by far dominates the economies of industrialized countries. The positive connection between tertiarization and per capita income is confirmed in both country cross-section and time series analyses. This development can be explained by demand factors (e.g. the growing proportion of female employees) and supply factors (e.g. cost disease in the service sector). This paper analyzes data on 23 service activities, grouped into four subsectors (distribution, business, social and personal services). The analysis of each subsector's contribution to the development of employment and productivity between 1983 and 2003 illuminates the prevailing productivity gap between the EU-15 and the U.S.A. The corresponding investigation of four new EU Member States during their transformation processes points to an employment potential in the tertiary sector that has not yet been fully utilized. The study further identifies four tertiarization models (dynamic, lagging, managed and catching-up) that can be associated with different geographic regions. The process of tertiarization is compatible with growth in both employment and productivity. Different combinations of production- and consumption-oriented services can have a positive effect on growth. The concluding section discusses the role of the European Union's Lisbon strategy in enhancing the productivity of the service sector.

JEL classification: O14, O52, O57, F15, L80, P20

Keywords: sectoral change, productivity, country comparison in the EU.

1 Introduction

The service sector is by far the most important sector in industrialized economies. The International Labour Organization (ILO, 2006) estimates the service sector's share of total employment in the European Union (EU) and other developed economies to have totaled 71.4% in 2005, having grown from 66.1% in 1995. Over the same period, the industry sector shrunk from 28.7% to 24.9%. Although services account for more than two-thirds of employment and value added, economic analyses and policies continue to focus on industrial production. Services are, of course, extremely heterogeneous; they are difficult to define, differentiate and categorize. Despite these difficulties, the tertiary sector is finally attracting increased national and international attention (for example through the EU Services Directive or the WTO's GATS negotiations).

The increasing importance of the service sector raises a number of significant questions: Is the structural change from agriculture to industry and on to services an unavoidable, natural phenomenon? Is there a distinct

pattern of different phases that all countries must go through in their development processes? What are the underlying reasons and determining factors? Which subsectors are particularly important? What are the consequences of tertiarization for employment, productivity and the economy as a whole? Can and should this process be influenced?

The purpose of this study is to summarize the key aspects of sectoral change and to review the findings obtained so far for the EU, including some of its new Member States. It is structured around the following two central working hypotheses:

1. The process of tertiarization is compatible with growth in both employment and productivity.
2. Different combinations of production- and consumption-oriented services can have a positive effect on growth.

In the following sections, the authors investigate the long-term growth trends observed in the tertiary sector and analyze the share of the individual subsectors in total employment and productivity in the EU as compared to the U.S.A. This comparison mainly

Refereed by
Robert Stehrer,
Vienna Institute
for International
Economic Studies.

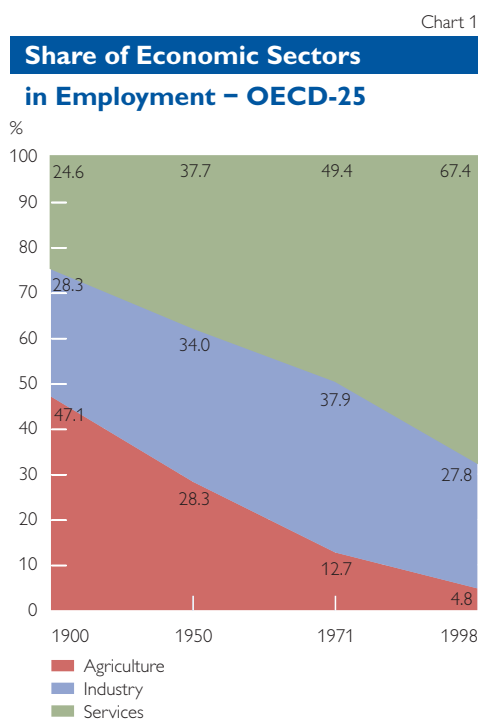
uses the data of the *Groningen Growth and Development Centre* (GGDC, 2005), which provides a comprehensive dataset for the EU and the U.S.A. between 1979 and 2003 and for the Czech Republic, Hungary, Poland and the Slovak Republic from 1995 to 2003.¹ The database subdivides the economy into 57 industries (activities), of which 23 are allocated to the service sector.

This study is organized as follows: Section 2 provides a summary of the tertiarization trends prevailing in the OECD region and analyzes the various theoretical approaches to sectoral change. Section 3 investigates and categorizes the individual segments within the service sector with regard to their shares of total employment and productivity in the EU and the U.S.A. Box 2 provides details on the development in the four largest new EU Member States. Section 4 attempts to analyze country-specific changes along different development paths. Finally, the authors draw first conclusions for the EU and its new Member States.

2 Sectoral Change: Developments and Initial Explanations

The process of economic development is connected with systematic structural change in most countries: As per capita income rises, the primary sector loses in importance, while the manufacturing industry initially gains momentum but is eventually surpassed by the constantly growing service sector.

The historical share of employees in a representative weighted average of highly developed countries² shows that the production of material goods has long since lost its leading position. This would imply that the so-called industrialized nations have actually entered the stage of post-industrial service economies.



A division into distinct development stages does not, however, sufficiently take into account that the volume of industrial production continued to grow over the whole period under consideration. Measured in constant prices, the share of industrial production in gross value added in the

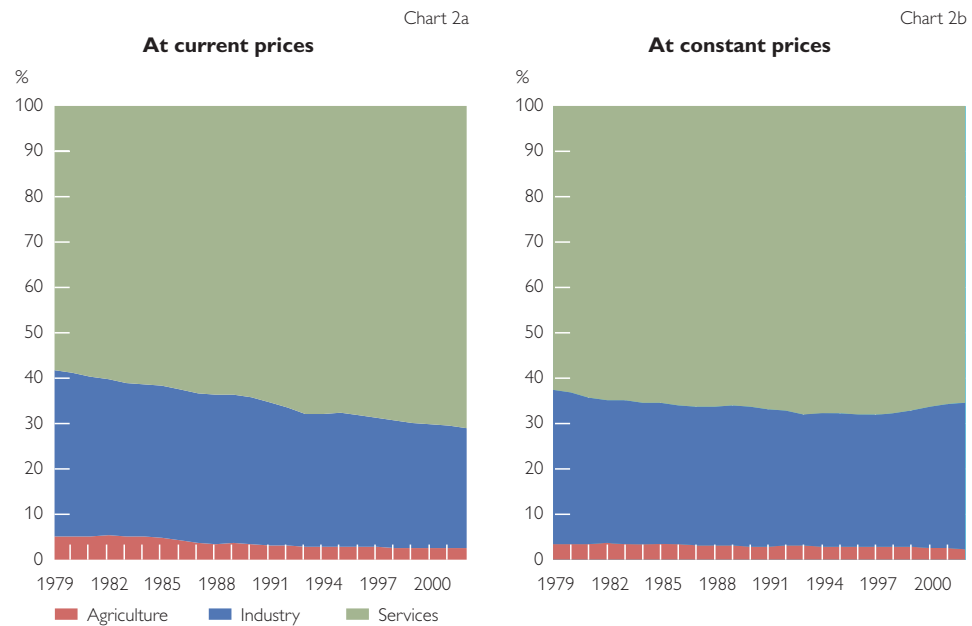
¹ No data are provided for the other new EU Member States.

² Given the lack of availability of long time series of data for sector employment in the OECD region, Feinstein's analysis (1999) was used as it forms a historical data series from a large number of sources in the most consistent manner possible. The percentages were determined after summation of the absolute figures. The 25 countries are made up of the EU-15 (not including Luxembourg), the four largest new EU Member States (Czech Republic, Hungary, Poland, Slovak Republic), Canada, the U.S.A., Japan, Australia, New Zealand, Norway and Switzerland.

OECD region has remained relatively stable. The widespread perception of a permanent decrease in value added by industrial production is only reflected

by current prices. This typical development is shown by the example of the EU-15 for the period from 1979 to 2002 (charts 2a and 2b).^{3,4}

Share of Economic Sectors in Gross Value Added – EU-15



The discrepancy between nominal value added (at current prices) and real value added (at constant prices) is caused by the comparatively stronger productivity growth in the industry sector,⁵ which means that the relative prices for material goods in comparison to services have been falling. This development challenges the notion that deindustrialization is basically a

substitution process in favor of the service sector.⁶ Despite the increasing degree of tertiarization, all three sectors will continue to coexist in the foreseeable future.

Although tertiary employment has developed in a similar manner in the individual countries, this process has by no means been uniform, as can be seen from the development paths of

³ The chart is based on constant prices (level of 1995) in euro taken from the GGDC database (2005), adjusted by industry-specific deflators. The U.S. data (at fixed prices of 1995 in U.S. dollars) provide a comparable picture (also see Economist, 2005). Rowthorn and Wells (1988) described this phenomenon as early as 1988.

⁴ Trends in West Germany before 1991 were combined with the data from unified Germany.

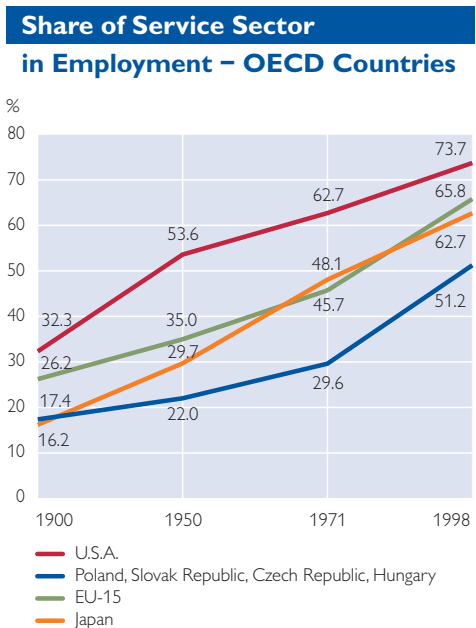
⁵ Measurement of productivity in the service sector does, however, open up a number of problems. For example, output from the service sector is mostly of an intangible nature and thus difficult to quantify. Furthermore, little information is available on the price and quality of the services provided, and on the effects of labor and technology characteristics on productivity (European Commission, 2003). Particularly in the public sector, output is defined as the sum of input factors, as there are no market prices available. For further reasons for a potential underestimation of productivity in the tertiary sector, see Gordon (1996).

⁶ In fact, lower relative prices should actually cause an increase in demand for material goods. However, demand stagnates because of substitution and income effects: material goods are obviously complementary and/or inferior goods.

the world's three largest economic areas and the largest new EU Member States (chart 3).

In this context, the lag in the onset of this transition process is particularly noteworthy. Tertiarization started first in the U.S.A., then in Japan and finally in Europe. The four largest new EU Member States (the Czech Republic, Hungary, Poland and the Slovak Republic) underwent drastic changes in their industrial structures during the transformation to modern market economies over the past decade. Despite this rapid transition, these countries still have a lower share of employment in the service sector than the EU-15.

Chart 3

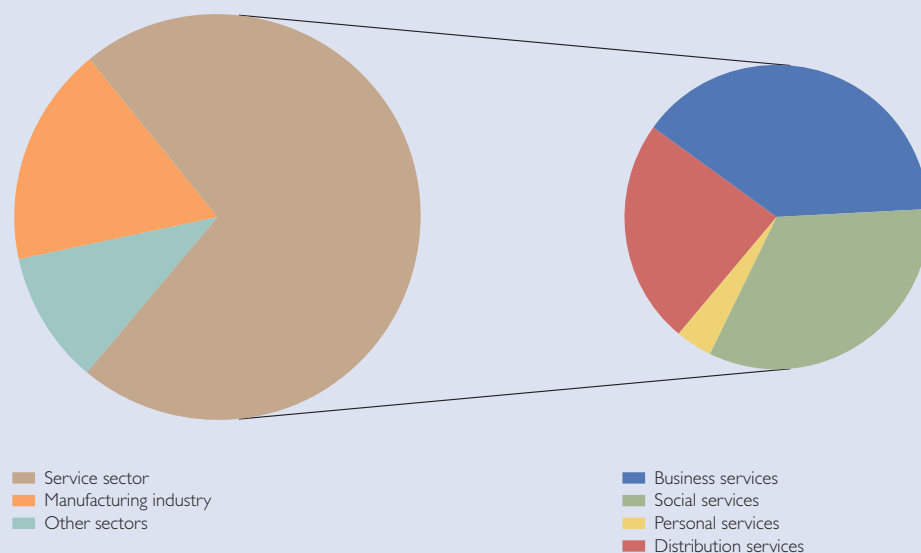


Box 1

What is a Service?

The service sector (also known as the tertiary sector) comprises activities that are not included in the extracting primary sector (mining, agriculture, fishing) or in the manufacturing secondary sector (industry and trade). Apart from this definition as a residual category, services are usually regarded as invisible, nonperishable and intangible. A further characteristic is that, in most cases, production and consumption occur simultaneously, i.e. through immediate interaction between consumers and service providers (*uno-actu principle*). The line between the rendering of services and the provision of goods is, however, increasingly becoming blurred. Software programs are a good example of this trend: they can be delivered physically (CD-ROM) or they can be made available through online services. Not least because of these definition problems, the concept of “services” must be analyzed in closer detail.

Share of (Sub)Sectors in Value Added – EU-15 (2003)



Source: GGDC (2005), OeNB.

The service sector can be classified in different ways. The categorization scheme used in this paper – dividing the sector into four subsectors (Singelmann, 1978), each of which is assigned a given ISIC⁷ category – is one of the most frequently used methods:

Distribution services are mainly made up of the following activities: sale, maintenance and repair of motor vehicles and motorcycles, retail sale of automotive fuels, wholesale trade and commission trade, retail trade, repair of personal and household goods, inland, water and air transport, supporting and auxiliary transport activities except the activities of travel agencies, communications.

Business services include financial intermediation, insurance and pension funding (except compulsory social security), activities auxiliary to financial intermediation, real estate activities, renting of machinery and equipment, computer and related activities, research and development (R&D), legal, technical, advertising and other business activities.

Social services comprise activities in the areas of public administration, defense, compulsory social security, education, health and social work.

Personal services are divided into the segments of hotels and catering and private households with employed persons.

The first two subsectors, distribution and business services, can be further aggregated into **intermediary or production-oriented services** that serve as inputs for the production of goods and services belonging to other (sub)sectors. The second two subsectors, social and personal services, constitute the collective category of **final or consumption-oriented services**, destined for final consumption.

An alternative classification system divides services according to their institutional characteristics, distinguishing between services supplied by the market and government or public services. This system must, however, take into account differences between the individual countries, for example those caused by different welfare state models.

⁷ International Standard Industrial Classification of all Economic Activities.

The theory of sectoral change can be divided into demand⁸- and supply-oriented approaches (Schettkat and Yocarini, 2003):

Demand Approaches

The three-sector hypothesis, which was first introduced by Fisher (1935) and Clark (1940), states that a gradual shift in employment and value added from the primary to the tertiary sector is inherent in the process of economic development. This hypothesis was based on the observation that most services have higher income and lower price elasticities than agricultural or industrial products. Consequently, sectoral change can be characterized as a demand phenomenon. With rising income levels, the demand for *inferior* goods will inevitably be saturated eventually, while the demand for *superior* services will continue to grow.

As postulated by Adolph Wagner back in 1863, in industrialized countries government expenditures will grow at a faster rate than the output of goods and services (*law of increasing state activity*). The fact that more collective services are provided as incomes rise reflects voter preferences and politicians' interests, but also the fact that individual demand does not sufficiently take into account the positive external effects of social services.⁹

Demographic factors must also be named as further demand-oriented determinants of structural change, although rising rates of participation by women influence not only the

demand for services but also their supply. A reduction in average household size also plays a role, as this reduces the economies of scale for the provision of services within families (Pohl, 1970). A high level of service employment goes hand in hand with a high rate of female participation in the labor market, as is evidenced by a comparison of OECD countries (Pilat, 2005). Furthermore, the increasing dependence ratio of people not gainfully employed – reflecting, above all, the changing age structure of the population – leads to a greater demand for services.¹⁰

Supply Approaches

Fourastié (1954) interprets structural change similar to the Fisher-Clark model, but places primary focus on the changes in labor productivity caused by technological progress. According to Fourastié, the service sector is a “catch basin” for the labor force released from agriculture and industry.

Baumol (1967) takes a more pessimistic view of the phenomenon of below-average productivity development in the tertiary sector. Because of their technological structure, limited capital intensity, and a lack of returns to scale, the productivity of services can only be raised *sporadically*. To guarantee the required level of quality it is necessary to employ a minimum amount of labor, as Baumol illustrates by the example of a quintet concert. As, however, wages in all sectors are

⁸ We are speaking of long-term structural determinants of demand. Rowthorn and Wells (1988) also observe an anti-cyclical component in deindustrialization.

⁹ Section 3 demonstrates, however, that the EU-15 figures for employment in public administration and defense have fallen over the recent years (catchwords: administrative reform, peace dividend). Furthermore, anecdotal evidence of the outsourcing or privatization of social services suggests that Wagner's theory might not have the character of a definite law.

¹⁰ Income differentiation represents a further factor, the level of which displays a positive correlation with the volume in consumption-oriented (personal) services, but correlates negatively with that of the sector as a whole (Bosch and Wagner, 2003).

oriented toward the technologically *progressive* manufacturing sector – presuming intersectoral labor mobility – the costs in the technologically unchanging sector rise. Consequently, an increasing proportion of labor must be channeled into low-growth activities (services), which in turn causes this *cost disease* to spread to the economy as a whole, successively slowing down economic growth.

The growing share of the service sector in employment and value added can also be understood as a result of corporate strategies. Such changes in industrial organization are not exclusively aimed at outsourcing jobs yielding low productivity or lacking strategic importance. On the one hand, specialized service companies satisfy demand at lower prices by exploiting returns to scale. On the other hand, organizational economies, synergies and learning effects (Landesmann and Petit, 1995), market developments, and institutional factors (tax or environmental laws) contribute to the rising importance of (complementary) business services (Mesch, 1997).

The growing popularity of outsourcing strategies may correlate with decreasing transaction costs, technological change and a rise in competitive pressure. It is certainly also connected to globalization tendencies that themselves affect the size of the service sector. The acceleration of worldwide direct investments and the increased intensity of global trade go hand in hand with the (international) outsourcing of production and service functions. The effective management of these outsourcing activities requires additional capacities in the service sector (R&D, design, marketing, logistics,

legal and tax consultancy, information and communication technology (ICT)). In this context, the liberalization of formerly heavily regulated service industries should be mentioned as a factor that might stimulate employment and productivity.

While advanced economies enjoy a historically developed comparative advantage as market pioneers in the globalization of (financial and corporate) services, the international outsourcing of ancillary service inputs is a relatively new trend. The prerequisites for this process are technological innovations, such as the development of broadband networks, regulatory reforms and trade liberalization, as well as the creation of a global market for highly qualified employees. Countries like India, but also Ireland and the Czech Republic, profit from this development. The feared negative effects on employees in high-wage countries could only be observed in case studies (Pilat, 2005).

3 The Service Sector as an Engine for Employment and Productivity?

Apart from the importance of the service sector for employment and value added in the economy as a whole, questions arise about the role services play in the growth of employment and productivity. In the EU-15, the total number of persons employed in the period from 1993 to 2003 rose by approximately 10%, with almost 13 percentage points resulting from employment growth in the service sector. In other words, the remaining sectors made a negative contribution of almost 3 percentage points.¹¹ A quite different picture emerges, however,

¹¹ *Growth contribution figures indicate the extent to which each sector contributed to total growth (in percentage points). The sum of growth contributions thus equals the growth rate of total employment within the service sector. The same applies for contributions to growth in labor productivity (also see OECD, 2003).*

when looking at the service sector's impact on labor productivity growth. Between 1993 and 2003 overall labor productivity (measured in value added per employee¹²) rose by more than 40% in the EU-15, but the service sector contributed just under 7 percentage points to this increase. The service sector as a whole thus made an above-average contribution to the growth of employment in the EU-15, but only a below-average contribution to productivity growth. In the same period, the U.S.A. recorded a slightly higher employment growth at almost 15%, with the service sector also accounting for the largest contribution. Labor productivity rose by more than 80%, and the service sector contributed almost 18 percentage points to this figure. These figures reveal the *productivity gap* that emerged between the EU-15 and the U.S.A. in this period, a gap that also exists within the service sector.

The broad spectrum of the service sector includes such heterogeneous fields as biotechnology research, gravel transportation, catering services and telecommunications. Such a diversity requires a differentiated approach in order to assess the impact of the individual activities on growth in employment and productivity. In this analysis, we focus on the EU-15 and use figures from the U.S.A. for comparison purposes. The service sector is divided into 23 activities in accordance with the *ISIC* classification (*revision 3, two- and three-digit level*; also see tables in the appendix). These tables not only present the shares of the individual

activities in employment and value added, but also show how these shares have changed over time.

3.1 Employment

Employment in the service sector grew by more than 21% in the EU-15 between 1983 and 1993, with the growth rate slowing down somewhat, to just over 19%, in the period from 1993 to 2003. In the U.S.A., by comparison, employment increased by more than 28% in the first period, but its growth rate also declined to approximately 19% between 1993 and 2003.

The contributions to growth vary across individual activities in the EU-15 (chart 5) and lead us to conclude that robust growth in employment can be attributed primarily to particularly strong demand for small range of activities.¹³ In the period from 1983 to 1993, the labor-intensive field of *health and social work* made the greatest contribution to growth, followed by *legal, technical and advertising* and *other business activities*. Some fields, such as *water and air transport* and *communications* either made a very small or even a negative contribution to employment growth. In the second period (1993 to 2003), the contribution of *other business activities* increased strongly. This segment, which comprises production-related business services, makes up a substantial proportion of employment and will definitely require a more detailed statistical analysis in the future. Positive development continues to be seen in the fields of *auxiliary transport activities and activities of travel agencies*, as well as *computer and related activities*.

¹² In the calculation of labor productivity, labor input is based on the more common measure of persons employed rather than hours worked. Wölfl (2003) found the choice of input variable to have but a marginal effect on the result. In the case of the service sector, moreover, there is no conclusive evidence as to which of the two input factors results in higher labor productivity growth.

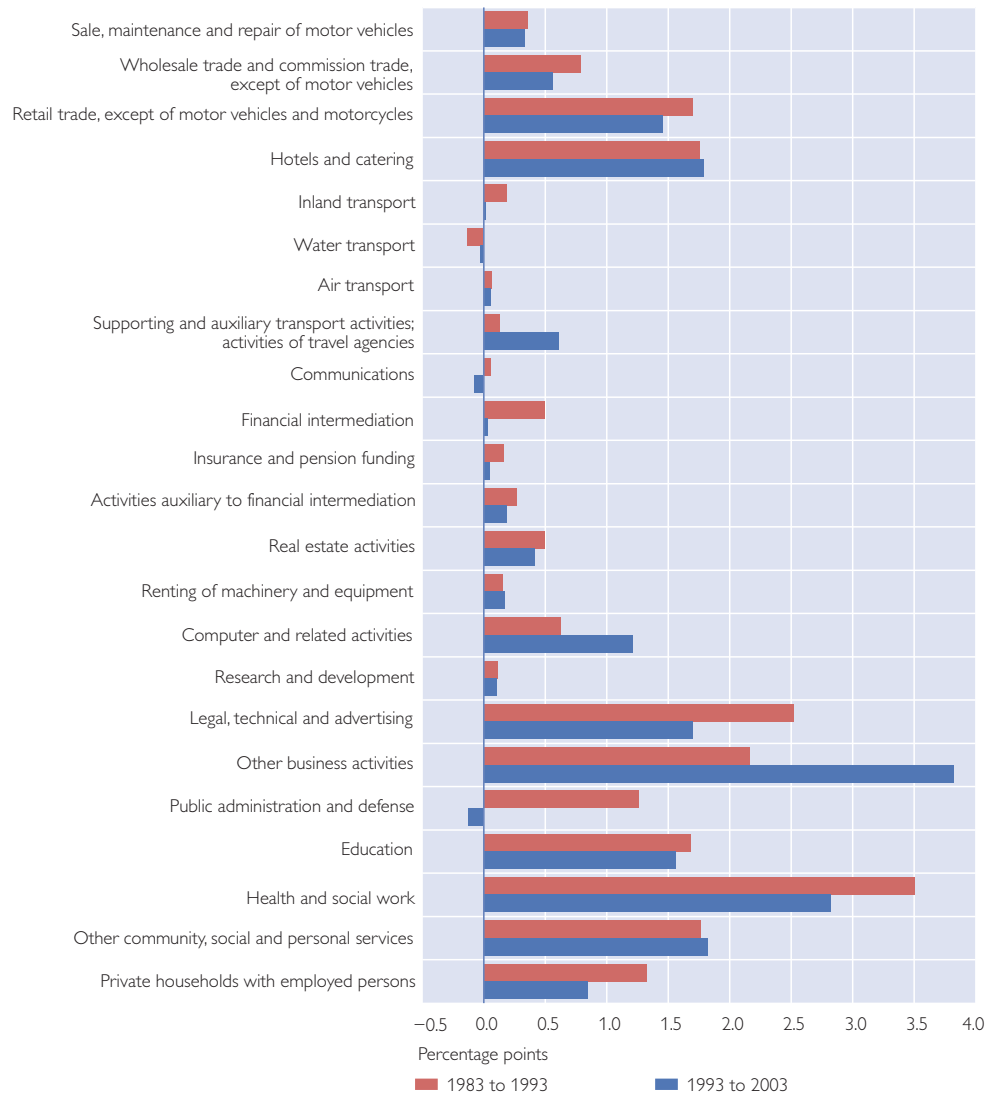
¹³ In the following section, we will only briefly outline the developments in the service sector, as a detailed analysis of individual activities or countries would go beyond the scope of this study.

HIGH EMPLOYMENT WITH LOW PRODUCTIVITY?
THE SERVICE SECTOR AS A DETERMINANT
OF ECONOMIC DEVELOPMENT

The contributions of the remaining activities to employment remained almost constant or dropped, with a particularly strong decline in *public administration and defense*.

Chart 5

Contribution of Service Activities to Employment Growth – EU-15

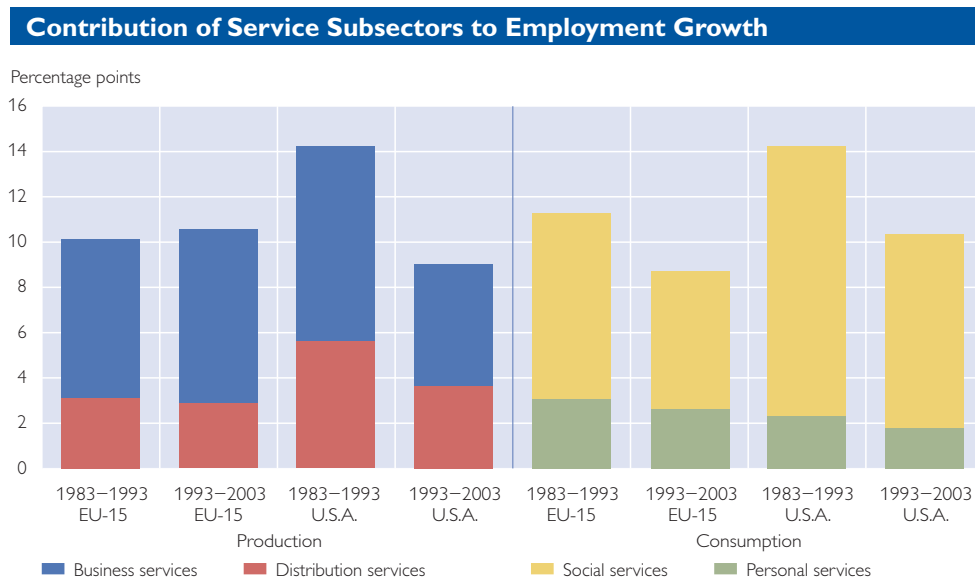


Source: GGDC (2005), OeNB.

The categorization of the activities described above into four subsectors – *distribution, business, social and personal services* (box 1) – shows that in the period from 1983 to 1993 *social service* activities made the largest contribution to employment growth in both the EU-15 and the U.S.A. (chart 6). Between 1993 and 2003, however, both regions experienced a significant decline in this segment's contribution

to growth. The contribution from *business services* in the EU-15 rose slightly in the second period, while that of *distribution services* fell somewhat. In the U.S.A., the contributions provided by *business* and *distribution services* went down. *Distribution* and *personal services* made only slight contributions to the growth in employment in both the EU-15 and the U.S.A.

Chart 6



Source: GGDC (2005), OeNB.

The classification by demand type (*production* and/or *consumption*) in chart 6 indicates that between 1983 and 1993, consumption-oriented services contributed more to employment growth than production-oriented services in the EU-15. In the U.S.A., the balance was fairly equal. In the period up to 2003, however, the picture drastically changed and the contribution to growth from consumption-oriented services dropped in both regions. This is apparently a consequence of administrative reforms and, to some extent, health and social reforms and the corresponding cuts in employment. In the EU-15, the contribution from pro-

duction-oriented services rose slightly, and therefore most new jobs were created in this segment. In the U.S.A., where the contribution made by production-oriented services declined markedly, more jobs were created in consumption-oriented industries during the second period.

3.2 Productivity

From 1983 to 1993, labor productivity grew in the entire service sector by more than 11% in the EU-15 and by just over 3% in the U.S.A. In the period up to 2003, however, the U.S.A. made substantial gains in productivity growth, achieving a growth

HIGH EMPLOYMENT WITH LOW PRODUCTIVITY?
THE SERVICE SECTOR AS A DETERMINANT
OF ECONOMIC DEVELOPMENT

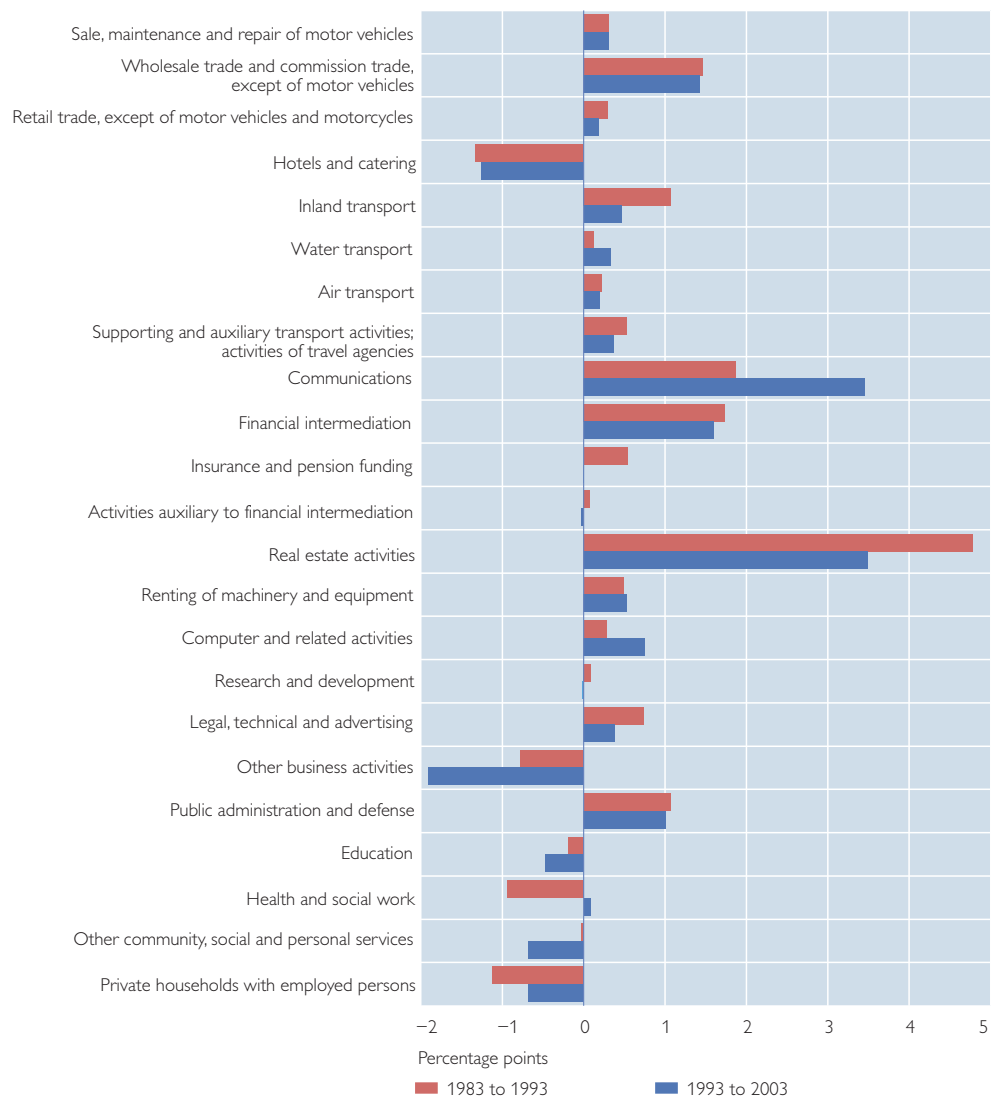
rate of more than 24%. In the EU-15, by contrast, growth declined to just over 9% from 1993 to 2003. This raises the question of which service industries were responsible for the different courses in productivity development.

The *communications* field was single biggest contributor to labor productivity in the EU-15 during the second period, which can be attributed to, among other reasons, the liberalization of the telecommunications market.

Between 1993 and 2003, *real estate activities* and *financial intermediation* also generated a higher rate of growth in labor productivity than during the previous period. The contribution from *real estate business* remained at a high level at first, but dropped by almost 50% in the second period. *Other business activities* and *hotels and catering* most strongly slowed down labor productivity growth in the service sector (chart 7).

Chart 7

Contribution of Service Activities to Labor Productivity Growth – EU-15

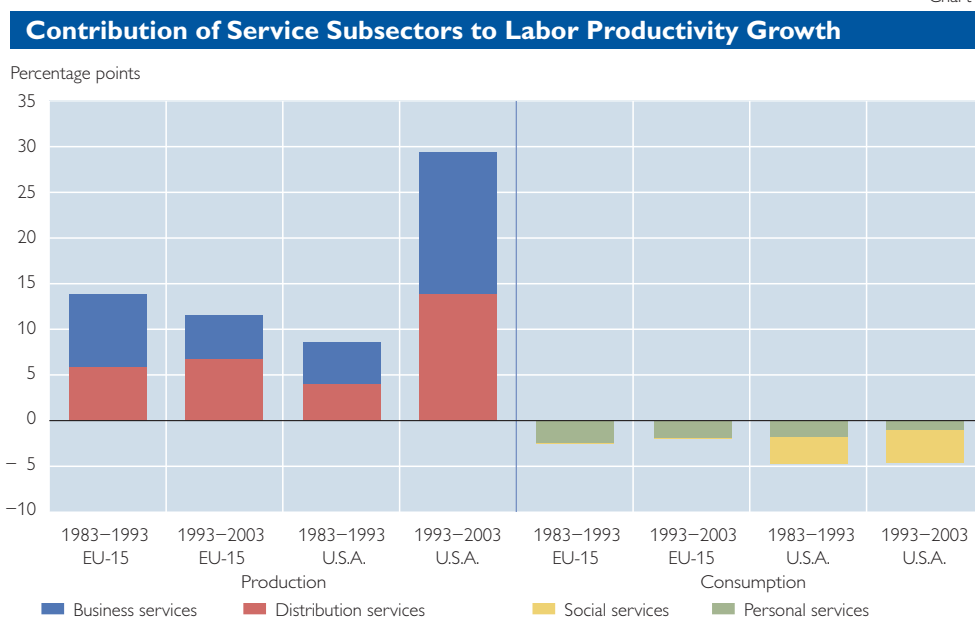


Source: GGDC (2005), OeNB.

The total contribution of *personal* and *social services* to growth in labor productivity was negative for both periods and country groups. These industries are typically labor-intensive with a low level of competition – both factors that slow productivity. The productivity growth in the service sector is thus attributable to market services, such as *distribution* or *business services*. In the period from 1993 to 2003, there was, however, a substantial decrease in

the contribution from *business services*, basically reflecting the decline in *real estate business*. The downturn experienced in some segments within *distribution services* was compensated by the sharp increase in contributions from *communications services*. In the U.S.A., in contrast, contributions from *distribution and business services* showed a marked increase in the second period as compared with the first.

Chart 8



Source: GGDC (2005), OeNB.

The broad categorization of services by the criteria of *production* and *consumption* shows that *production services* increased, and *consumption services* reduced labor productivity growth. In the EU-15, the negative contribution from *consumption services* but also the positive contribution from *production services* decreased slightly. In the U.S.A., by contrast, the contribution provided by *production services* climbed from approximately 9 percentage points to more than 30 percentage points. The strong labor productivity

growth experienced by the distribution service sector in the U.S.A. broadly reflects the development of trade activities. Large investments in ICT services led to a positive growth trend in labor productivity. Production-related services also displayed a greater intensity of R&D expenditure in the U.S.A. (European Commission, 2003). Pilat (2005) points to the higher degree of regulation in most EU countries in comparison to the U.S.A. This fact certainly added to the productivity gap between the U.S.A. and the EU-15,

as did the different courses of economic development.

The service sector not only accounts for the largest proportion of employment and value added but also creates the most jobs. This is particularly the case for business services and, to a lesser extent, for social services. In the EU-15, however, the service sector shows lower rates of productivity growth than in the U.S.A.¹⁴ Of the multitude of different industries, it is primarily business and distribution services that drive productivity. This is also where the lag behind the U.S.A. is most noticeable during the most recent period observed. This *productivity gap* can be explained, as has briefly been discussed above, by a com-

ination of different factors and sector-specific effects.

As a general rule, the limits of productivity growth can be attributed to structural factors, such as the necessity for individual care (social services). A low level of capital intensity with a correspondingly modest growth potential is a further factor. Services are generally limited to regional or domestic markets that are not open to competition and thus only develop a low level of R&D activities, if at all. Finally, the service sector is traditionally more heavily regulated than other sectors (Wölfl, 2005). The experience in the U.S.A. shows, however, that not all of these obstacles to productivity are insurmountable.

Box 2

Employment and Productivity Growth in Four New EU Member States

Employment Growth

The Czech Republic, Hungary, Poland and the Slovak Republic displayed similar yet different economic structures at the beginning of the transformation process from planned economies to market economies. In Poland, for example, the proportion of employees in the agricultural sector was substantially higher than in the other countries, while in the Czech Republic the manufacturing sector accounted for the highest share of employment. The service sector pattern was also mixed. While the tertiary sector was of relatively little importance in Poland, its share in total employment was already comparatively high at the beginning of the transformation process in the Czech Republic, Hungary and the Slovak Republic. It also grew more strongly in those three countries than in Poland, where a relatively high number of the labor force is still employed in the agricultural sector.

Despite the partially heterogeneous initial situation, the economic convergence of these countries with western industrialized nations fostered a process of deindustrialization, coupled with a strengthening of the tertiary sector. Between 1995 and 2003, the service sector provided a substantial above-average contribution to employment growth in all four countries, while farming and manufacturing had a negative or only slightly positive effect on employment.¹⁵

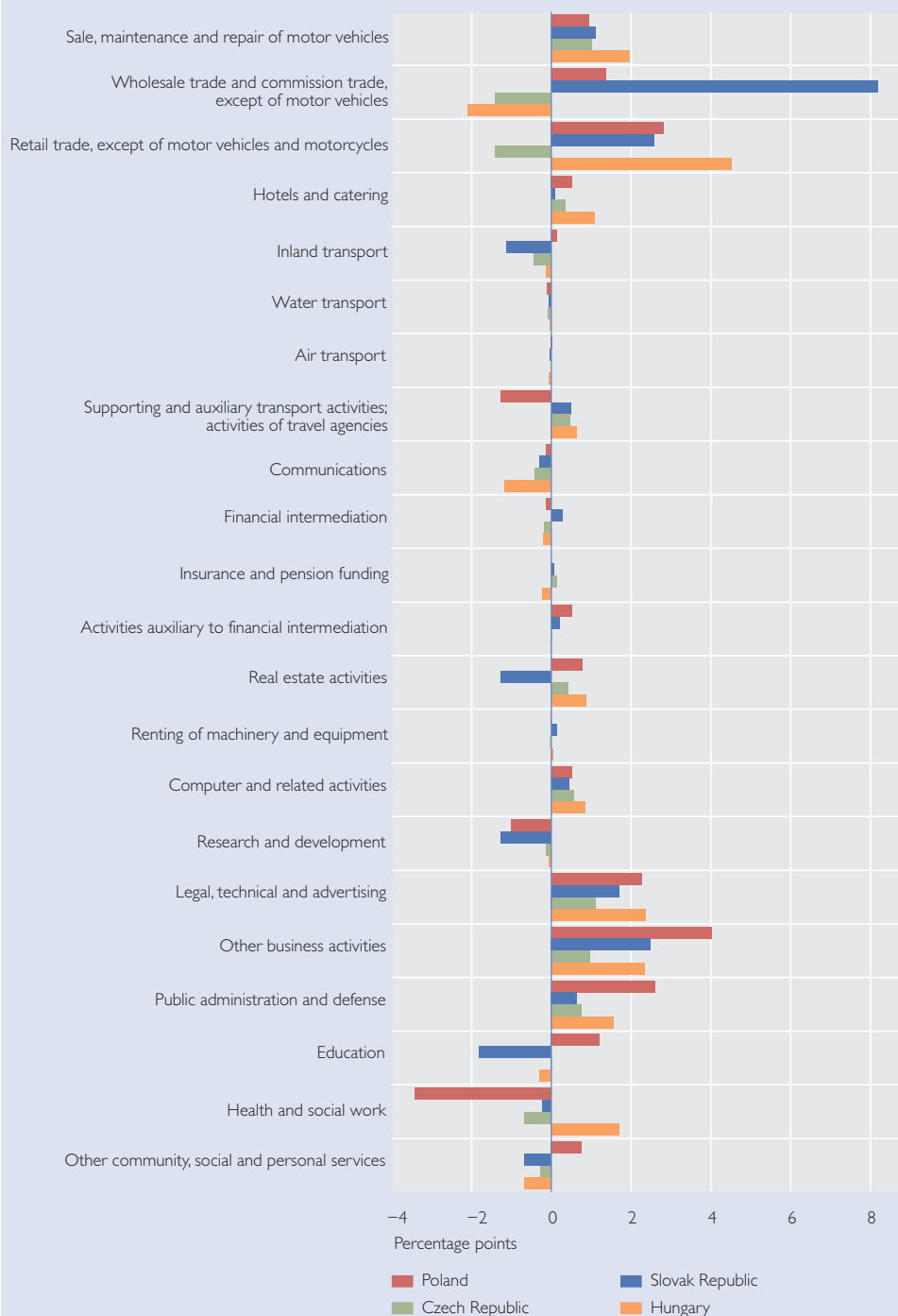
*In detail, the following picture emerges for the service sector (chart 9). In all four countries, industries such as sale, repair and maintenance of motor vehicles, hotels and catering, legal, technical, advertising and public administration made positive contributions to employment growth. The development of some segments, however, showed significant differences. **Retail trade**, for example, had a clearly negative effect on employment growth in the Czech Republic, while making a*

¹⁴ *The tertiary sector plays a crucial role in overall productivity growth, not only because of its large share in total employment and value added. Moreover, services also impact on the value added in other sectors, as not only goods but also, increasingly, services become integral parts of manufacturing processes.*

¹⁵ *From 1995 to 2003, total employment dropped by approximately 11% in Poland, 2% in the Slovak Republic and 5% in the Czech Republic. In Hungary, employment increased by more than 8%. The service sector made a positive contribution to employment growth in all four countries. The remaining sectors had a negative effect on employment growth, with the exception of Hungary, where these sectors made a slightly positive contribution.*

Chart 9

Contribution of Service Activities to Employment Growth (1995–2003)



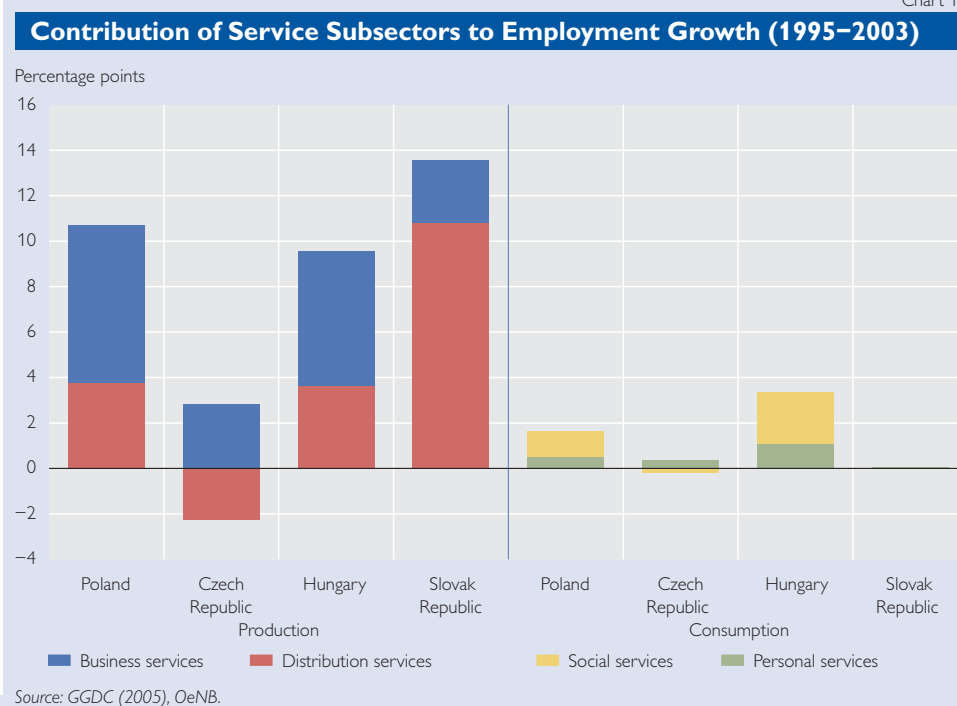
Source: GGDC (2005), OeNB.

HIGH EMPLOYMENT WITH LOW PRODUCTIVITY? THE SERVICE SECTOR AS A DETERMINANT OF ECONOMIC DEVELOPMENT

positive contribution in Hungary, Poland and the Slovak Republic. Health and social work, on the other hand, led to an increase in employment in Hungary but had a negative impact on employment growth in the other three countries.

The categorization of the subsectors into four groups shows a comparable development in Hungary and Poland (chart 10). The highest contribution to employment growth came from **distribution and business services**, coupled with a lower, but still positive contribution from **personal and social services**. In the Czech Republic, **personal and social services** made only a slight contribution to employment growth, whereas **distribution services** had a negative effect caused by the decline in jobs in the retail trade. In the Slovak Republic, employment in **personal and social services** remained almost unchanged, while the other fields experienced a marked increase.

Chart 10



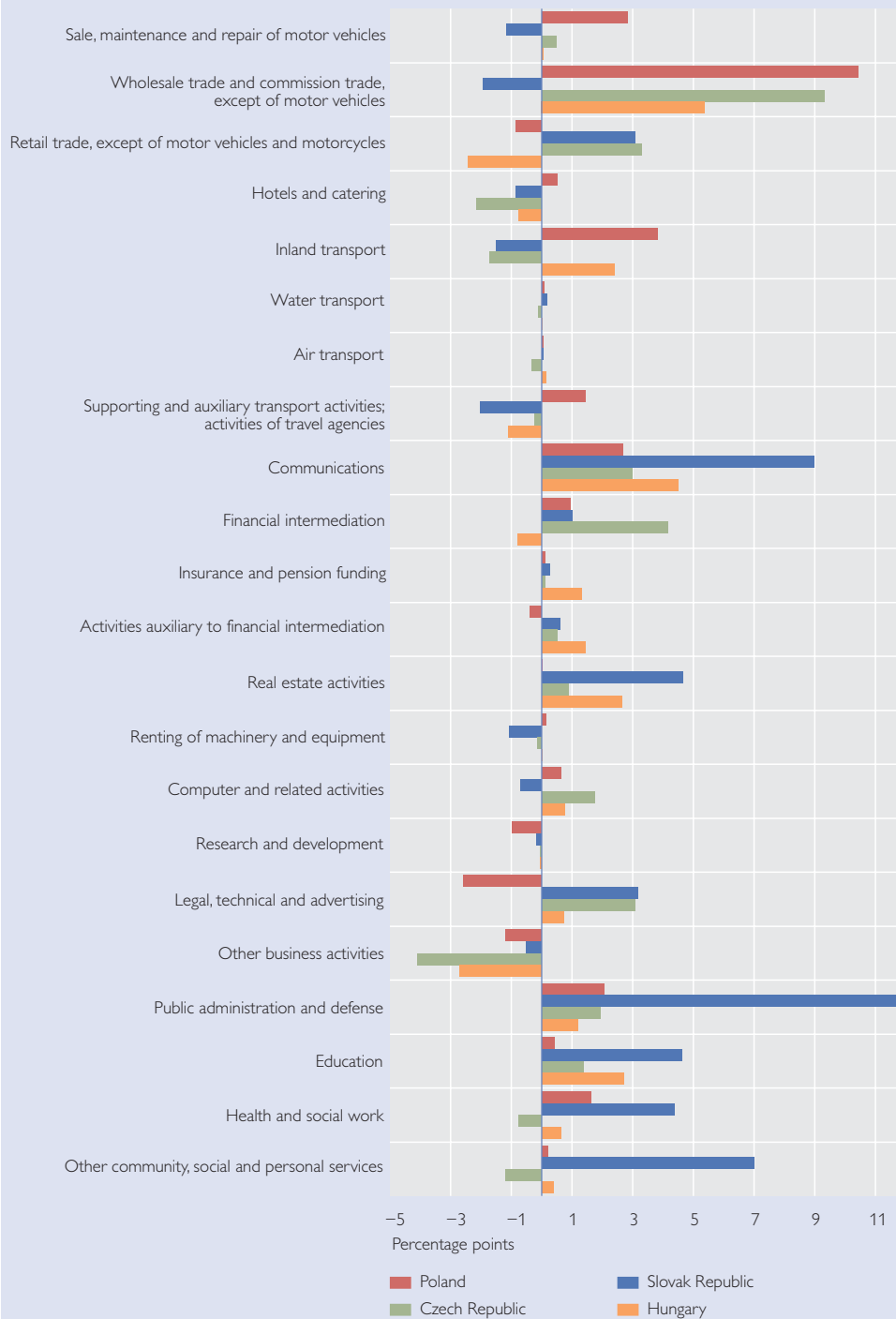
Labor Productivity Growth

In Hungary and Poland, the service sector's contribution to total labor productivity was below average, contrary to its contribution to employment growth. In the Czech Republic, the contribution to labor productivity growth from the other sectors almost equaled that of the service sector, while the growth achieved in the Slovak Republic was largely driven by the service sector.¹⁶

¹⁶ Between 1995 and 2003, total labor productivity increased by approximately 47% in Poland, by almost 40% in the Slovak Republic, by just over 30% in Hungary and by over 20% in the Czech Republic.

Chart 11

**Contribution of Service Activities to Labor Productivity Growth
(1995–2003)**



Source: GGDC (2005), OeNB.

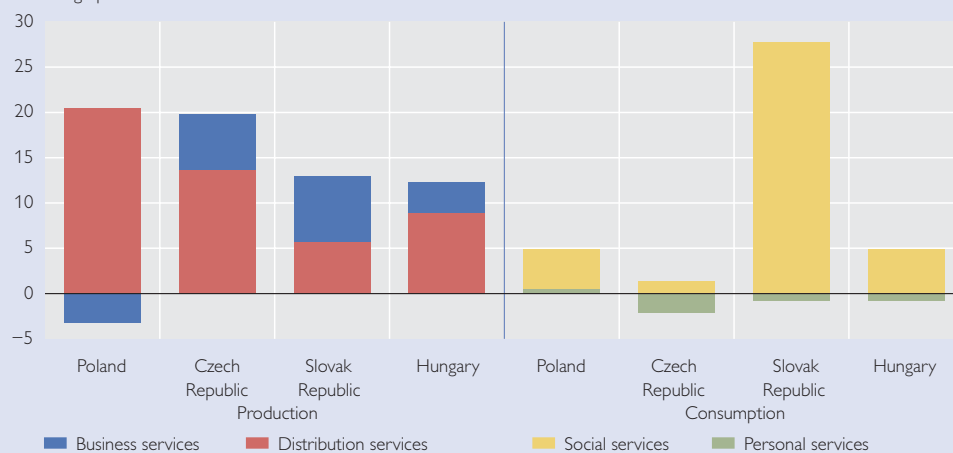
In all four countries, labor productivity growth within the service sector was supported by communication activities, and even the segments characterized by traditionally low productivity rates (public administration, defense and education) made a significant positive contribution to labor productivity growth. The contribution of other business activities was negative. Wholesale trade and commission trade had a marked positive effect on productivity growth in all countries under review but the Slovak Republic, reflecting the strong rise in employment in this segment.

Chart 12

Contribution of Service Subsectors to Labor Productivity Growth

(1995–2003)

Percentage points



Source: GGDC (2005), OeNB.

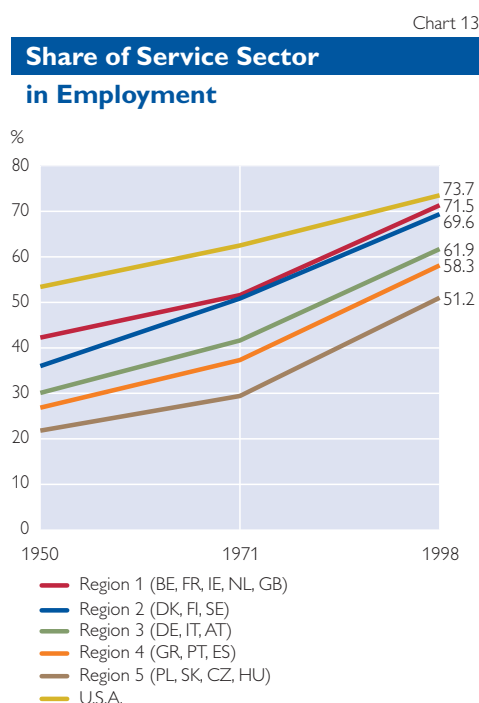
The parallel course of development in Hungary's and Poland's employment structure is partially reflected in labor productivity (chart 12). In both countries, the contribution of **business services** to employment growth was high, but it was low or even negative for labor productivity growth. The fact that **distribution services** made a substantial contribution to labor productivity growth in the Czech Republic and in Poland can be attributed to the positive development recorded in wholesale and commission trade, as well as in retail trade. **Consumption services (personal and social services)** had a negative effect on labor productivity growth in the Czech Republic, while Poland, Hungary and particularly the Slovak Republic recorded a positive contribution from this subsector.¹⁷

The phenomena of labor-dynamic business services and productivity-driving consumption services in Hungary, Poland and the Slovak Republic appear somewhat counterintuitive. This puzzle may be explained by the role of direct investments in business services such as marketing, design or accounting, which were newly established at a relatively high productivity level during the transformation process. At the same time, the demand for these services continues unabated and consequently affects employment growth. Inversely, distribution services and social services seem to overcome the legacy of underemployment and inefficiencies inherited from the past (Stehrer, 2005).

¹⁷ In the Slovak Republic, education and public administration account for a high relative share in employment and value added. A decrease in employment and/or an increase in gross value added will therefore significantly impact the labor productivity of the service sector.

4 Models of Tertiarization

Despite many areas of common ground, a country-specific analysis nevertheless reveals substantial differences in the development paths of the individual countries. The EU Member States can be grouped into geographic regions¹⁸ that shared certain characteristics with regard to the impact of service sector employment over the course of the last century (chart 13).



Source: Feinstein (1999), OeNB.

A comparison of these regions shows a distinct west-east and north-south divide. These differences can be explained to a large extent by the correlation with per capita real income levels or by historical factors, i.e. the different starting points of the industrialization process in the individual countries and, in some cases, periods of

planned economy. In the United Kingdom (Region 1), the process of tertiarization started much earlier. In contrast to the general trend toward convergence, the lag of the new EU Member States (Region 5) actually grew in the period between 1950 and 1971. Furthermore, the accelerated convergence process experienced in Denmark, Finland and Sweden (Region 2) gives particular rise to the assumption that the different development paths are actually the result of underlying systematic changes. We will now attempt to organize these patterns into four typical models (also see Häußermann and Siebel, 1998):

- model of dynamic tertiarization
- model of lagging tertiarization
- model of managed tertiarization
- model of catching-up tertiarization

The model of dynamic tertiarization describes an unrestricted structural change as seems most typical for the Anglo-Saxon region¹⁹ as well as for countries like Belgium, France or the Netherlands (Region 1). The model is based on the accelerated development of a broad and deep segment of market services, triggered by liberalization and deregulation. At a corporate level, this development is accompanied by strategies favoring the externalization of production-related services. Demand for consumption-related services is stimulated by a comparatively stronger focus on the domestic economy. At the same time, increasing differences in income levels generate a stronger demand for (financial) services (UNCTAD, 1995) as well as a low-wage segment in (personal) ser-

¹⁸ The geographic regions defined in this paper comprise the following countries: **Region 1:** Belgium (BE), France (FR), Ireland (IE), the Netherlands (NL) and the United Kingdom (GB); **Region 2:** Denmark (DK), Finland (FI) and Sweden (SE); **Region 3:** Germany (DE), Italy (IT) and Austria (AT); **Region 4:** Greece (GR), Spain (ES) and Portugal (PT); **Region 5:** the Czech Republic (CZ), Hungary (HU), Poland (PL) and the Slovak Republic (SK).

¹⁹ Interestingly, these groups are made up exclusively of countries (with the exception of Ireland) characterized by an early industrialization process and a strong colonial history.

vices. Literature initially took a critical stance toward the deindustrialization associated with this model (Baumol, 1967; Cohen and Zysman, 1987). This perception has, however, changed over time, and this type of deindustrialization is now considered *positive deindustrialization* (Rowthorn and Wells, 1988), as long as it reflects the degree of trade specialization on service exports and an economy's level of maturity rather than the impact of a recession.

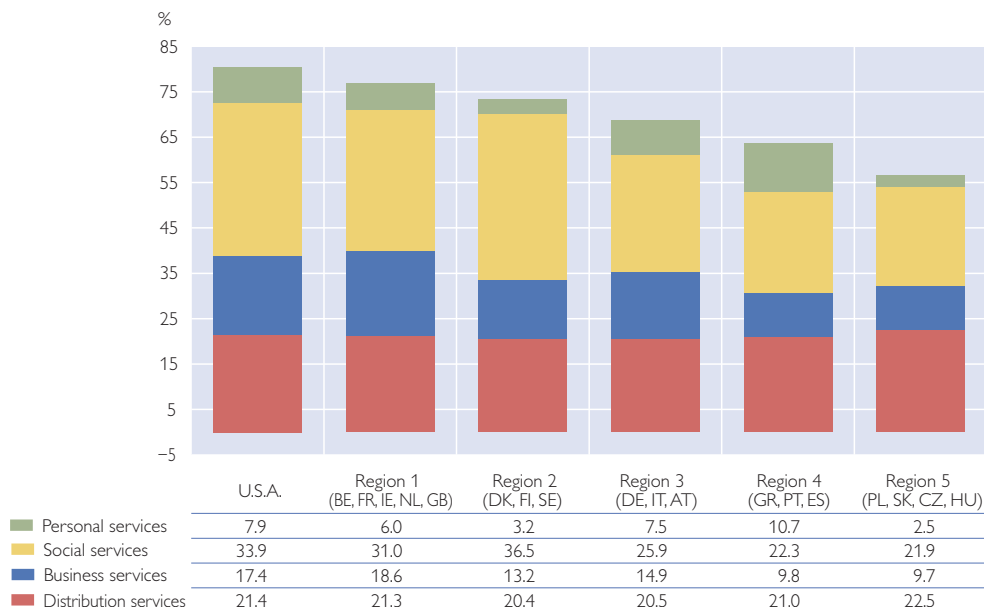
Lagging tertiarization can be viewed as a representative model of the structural development observed in long-term EU Member States such as Germany, Italy and Austria (Region 3), which is characterized by a comparatively stable position of the industry sector. This is, on the one hand, caused by the tendency of many manufacturing companies to internalize services, for example to maintain the quality standards of high-value material goods. On the other hand, this phenomenon is also a result of industrial policy intervention for the sake of vested interests. The protection of the secondary sector is frequently justified by the assumption that productivity growth can be best generated in this sector. Furthermore, lagging tertiarization is also characterized by the high share of manufacturing exports in GDP. This is mostly the result of a historically determined pattern of specialization in the international division of labor: a process in which original factor endowment, returns to scale, synergies and reputation effects play a role (*Made in Germany*, Italian design, etc.). Another reason for lagging tertiarization lies in the corporatist system of social partnership, which tends to give higher priority to the competitiveness of industrial locations than to other policy goals.

The model of *managed tertiarization* is associated primarily with Denmark, Finland and Sweden (Region 2). Some elements can also be found in the Netherlands (Region 1). This model embodies a strategy, followed more or less consciously, to promote the development of knowledge-based and social services. Despite their relatively late start at industrialization, these countries very soon evolved into service societies. The post-war *Scandinavian welfare state* was characterized by a highly productive manufacturing sector and a well-developed system of public and social services, combined with significant rates of female labor participation. The structural crisis of the late 1980s prompted a transition toward a knowledge society, accompanied by adjustments to the welfare state system, which was, however, basically kept in place. In this model, the public sector decreases only slightly in importance, remaining the most important employer for the female workforce and experiencing competition from the private sector particularly in the area of household-related services. The liberalized, production-oriented service sector, which is marked by strong cross-links to the modernized and export-oriented manufacturing sector, remains the main source of employment growth. The promotion of human capital development and innovation plays a central role in the model of managed tertiarization (Aring, 2003).

Catching-up tertiarization describes the transition process experienced by countries that joined the EU at a later stage: during the southern enlargement round – Greece, Spain and Portugal (Region 4) – or, most recently, in the eastern enlargement round – the Czech Republic, Hungary, Poland and the Slovak Republic (Region 5).

Chart 14

Share of Service Subsectors in Total Employment (2003)



Source: GGDC (2005), OeNB.

This model reflects the general shift toward the tertiary sector that is associated with rising per capita income. A further notable phenomenon is that deindustrialization and deagriculturalization in the countries of Region 5 not only occurred with a time lag, but also to a far stronger degree than in Region 4, particularly during the first recessive years of transformation until 1995. This is not surprising if we take into account the overly strong emphasis the former centrally planned economies put on the manufacturing industry. Employment in the service sector was considered unproductive for ideological reasons and the function of this sector in the economy was neglected (Vidovic, 2002). A large number of services were also integrated into the

agricultural or industrial conglomerates. These countries' transformation into market economies is therefore accompanied by a tertiarization process that takes place "in fast-forward mode," at least if including the first years of recession. This development does not, however, follow the same pattern across all industries (box 2). In several areas, a high proportion of foreign direct investments (wiiw, 2005) unquestionably contributed to the rise in productivity. Employment in the service sector is thus not yet in a position to fully compensate for the decline in jobs experienced in the other two sectors. Comparisons with similar developments observed in Greece, Spain and Portugal should, however, give cause for optimism

because a mainly long- and medium-term trend of convergence can be detected not only among all countries and groups of countries (or models), but also within the individual groups of countries (or models).²⁰

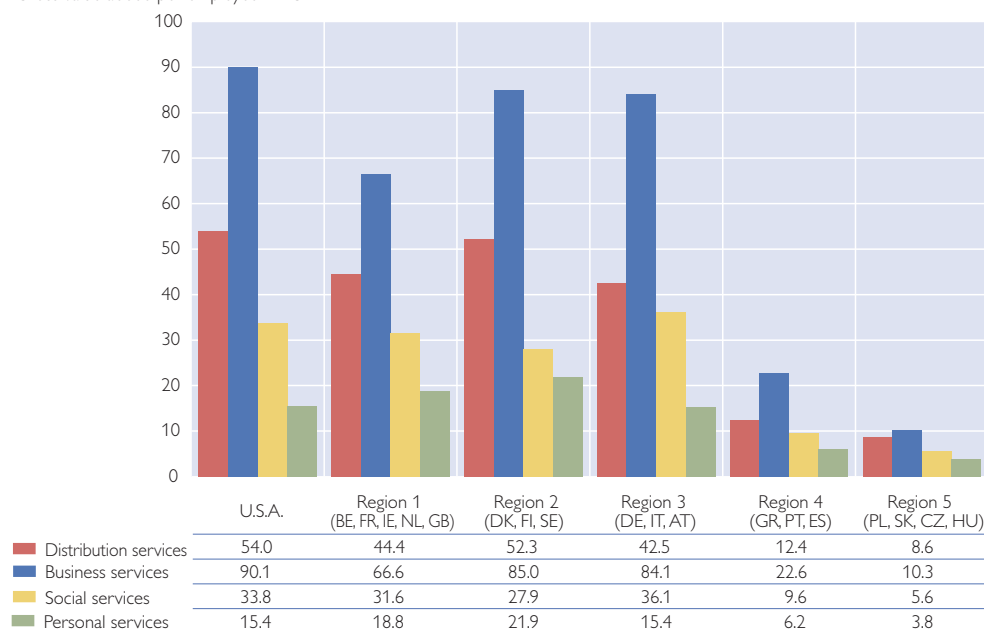
The classification by geographical regions (see footnote 18) shows that the individual countries frequently fit more than one model because they exhibit the characteristics of several pattern types (chart 14). With the ser-

vice sector accounting for only 66% of total employment, Ireland (Region 1) is the most obvious outlier. This ambiguity in allocation can also be illustrated by the example of France (also belonging to Region 1), where the share of the service sector (and not only public services) in total employment is high although the degree of regulation in the labor and product markets corresponds to the *lagging tertiarization* model.

Chart 15

Labor Productivity in the Service Sector (2003)

Gross value added per employee in EUR



Source: GGDC (2005), OeNB.

The comparison of the labor productivity levels in the various regions seems to confirm the results of the classification by region, albeit with some exceptions (chart 15). The United Kingdom (Region 1), for example, most closely matches the model of dynamic tertiarization, although its

productivity level does not equal that of the U.S.A. and is even lower than that of the Region 3 countries (Germany, Italy, Austria). In view of the measurement and differentiation problems inherent to service sector productivity, such results must, however, be interpreted with caution.

²⁰ This assessment is based on variances calculated for both the GGDC (2005) datasets covering the period from 1995 to 2002 and the data from Feinstein (1999), which cover almost the entire 20th century. The only divergence found was within the group of southern enlargement countries between 1971 and 1998, which can be attributed to the slow structural change in Portugal. A comparison between the EU and the U.S.A. also indicates the existence of permanent convergence.

The classification presented in this study offers an alternative basis for discussion with respect to the usual dichotomy between the U.S.A. and the EU. Numerous economists consider the service sector as a key to understanding the *productivity and growth gap* between Europe and the U.S.A. Rogerson (2005) also explains Europe's post-1950s employment gap with the underdevelopment of market services. Although, beginning in 1973, the tertiary sector significantly contributed to the deceleration of productivity growth in both economic areas, services (particularly financial and distribution services) caught up with the industry sector in the U.S.A. during the mid-1990s and subsequently contributed to an acceleration of productivity growth. Triplett and Bosworth (2003) conclude that *Baumol's cost disease* is cured and that the phenomenon known as *productivity paradox* – the failure of reinvestment in technology to boost productivity growth in the service sector – is solved. Van Ark (2005) pins his hope on the possibility that Europe could follow a similar pattern, even if the increase in the productivity of market services resulting from a more widespread ICT use would occur with a certain delay. The rapid adjustment of the economy requires, however, a supportive macroeconomic environment, flexible structures in product and factor markets, and the promotion of innovation diffusion and human capital creation. The EU's Lisbon strategy proposes a range of corresponding measures. Perhaps the objective of *becoming the most competitive and dynamic knowledge-based economy in the world* seems somewhat ambitious. Yet

the pursuit of employment and productivity gains in the service sector is nevertheless essential for the promotion of economic growth.

5 Conclusions

Sectoral change is a “natural” process (Economist, 2005) that occurs in all countries throughout the world and can be accelerated or slowed down only to a limited extent. The importance of the service sector for economic growth is often underestimated. In the enlarged EU, the service industry is already a crucial source of employment, and there is still room for expansion. Moreover, the potential of services to boost productivity has yet to be unlocked. Cross-links to the manufacturing sector and its role in the globalization process also influence the growth dynamics of the service sector. The experience of the U.S.A. or of countries like Denmark, Finland and Sweden shows that the suspicion of an inevitable *trade-off* between employment and productivity is unfounded. These examples also demonstrate that various combinations of distribution, business, social and personal services can produce similarly positive results.

The classification into four models of development paths presented in this study is only a rough sketch but confirms the initial impression of the existence of different tertiarization models, although an empirical test has not yet been performed. A further field of research is the productivity growth of services.²¹ The European service sector can only be effectively cured once the *cost disease* has correctly been diagnosed. Its recovery would boost

²¹ More insights into this topic can be expected in the near future, for example from the EU KLEMS Project on Productivity in the European Union coordinated by the Groningen Growth and Development Centre (www.euklems.net).

economic growth and thus facilitate securing price stability in monetary policy²² in the longer term (Cette and Pfister, 2004).

Particularly, the Member States that joined the EU during the southern enlargement round (Greece, Spain and Portugal) and the new Central and Eastern European EU Member States need to decide which of the advanced tertiarization models would be the best way forward for them. In this respect, the Lisbon strategy provides some direction for convergence toward the model of *managed tertiarization* (European Commission, 2006). A large number of the quantitative Lisbon objectives would imply direct or indirect impulses for the development of highly productive and socially balanced service economies. Efforts will focus on increasing employment rates, especially in the female labor force, facilitating broad-based education among young people, raising the levels of private and public R&D investments, intensifying competition, improving regulation²³ and ultimately completing the single market for services while preserving social cohesion. OECD rec-

ommendations, moreover, urge for further reforms to increase productivity in the service sector: Open national and international markets for services, flexible labor markets, lifelong human capital investment, targeted innovation policies, comprehensive implementation of information and communication technology, and a favorable tax system assist in meeting the challenge of globalization (Pilat, 2005).

Knowledge-intensive corporate services increasingly shrink the borders between the different sectors. The multiplier effect of such services ultimately guarantees the continuity of industrial production with a high degree of value added. At the same time, (public) social services and (private) personal services provide the prerequisites for reconciling family and career, drive out the hidden economy and improve the quality of life in a population characterized by a changing age structure. Last but not least, an evolving service culture that meets new needs and that combines professional with social skills and innovation with flexibility promotes both growth and employment.

References

- Aring, J. 2003.** Industrielle Produktion und Dienstleistungsgesellschaft als komplementäre Säulen der Modernisierung in Schweden. *Norden* 15. 15–22.
- Baumol, W. J. 1967.** Macroeconomics of Unbalanced Growth: the Anatomy of Urban Crisis. In: *The American Economic Review* 57. 415–426.
- Bosch, G. and A. Wagner. 2003.** Beschäftigungshoffnung Dienstleistungen braucht politische Begleitung. IAT-Report 2003-04. Wissenschaftszentrum Institut Arbeit und Technik. Gelsenkirchen.
- Cette, G. and C. Pfister. 2004.** Challenges of the “New Economy” for Monetary Policy. *International Productivity Monitor*. CSLS. Ottawa.
- Clark, C. 1940.** (Revised New Edition 1951). *The Conditions of Economic Progress*. London: Macmillan.
- Cohen, S. and J. Zysmann. 1987.** *Manufacturing Matters. The Myth of the Postindustrial Economy*. New York: Basic Books.

²² In the short term, however, insecurities regarding potential growth lead to asymmetric costs (Cette and Pfister, 2004).

²³ Peneder, Kaniovsky and Dachs (2001) make a plausible case that services are confronted with asymmetric information problems to a greater extent because of the simultaneous nature of production and consumption. Therefore, standardization of quality is called for to strengthen consumer trust and competition.

- Economist. 2005.** Industrial Metamorphosis: Manufacturing Employment. *The Economist*. September 29.
- European Commission. 2003.** The Competitiveness of Business-Related Services and their Contribution to the Performance of European Enterprises. Brussels: European Commission.
- European Commission. 2006.** The New Lisbon Strategy: An Estimation of the Economic Impact of Reaching Five Lisbon Targets. http://europa.eu.int/comm/enterprise/enterprise_policy/competitiveness/doc/industrial_policy_and_economic_reforms_papers_1.pdf
- Feinstein, C. 1999.** Structural Change in the Developed Countries During the Twentieth Century. In: *Oxford Review of Economic Policy* 15/4. 35–55.
- Fisher, A. G. B. 1935.** *The Clash of Progress and Society*. London: Macmillan.
- Fourastié, J. 1954.** *Die große Hoffnung des zwanzigsten Jahrhunderts*. Cologne: Bund-Verlag. (Original Edition: 1949. *Le Grand Espoir du XXe siècle. Progrès technique, progrès économique, progrès social*. Paris: Presses Universitaires de France).
- GGDC. 2005.** Groningen Growth and Development Centre, 60-Industry Database. October. <http://www.ggdc.net>
- Gordon, R. J. 1996.** Problems with the Measurement and Performance of Services Sector Productivity in the United States. NBER Working Paper 5519. 139–166.
- Häußermann, H. and W. Siebel. 1998.** *Dienstleistungsgesellschaften*. Frankfurt am Main: Campus.
- ILO. 2006.** Global Employment Trends Brief. www.ilo.org/public/english/employment/strat/download/getb06en.pdf
- Landesmann, M. A. and P. Petit. 1995.** International Trade in Producer Services: Alternative Explanations. In: *The Service Industries Journal*, 15/2. 123–161.
- Mesch, M. 1997.** Die Ursachen für die Beschäftigungsentwicklung im Dienstleistungssektor. In: *Wirtschaft und Gesellschaft* 23/1. 11–54.
- OECD, 2003.** OECD Science, Technology and Industry Scoreboard 2003 – Towards a Knowledge-Based Economy. www1.oecd.org/publications/e-book/92-2003-04-1-7294/D.5.htm
- Peneder, M., K. Kaniovsky and B. Dachs. 2001.** External Services, Structural Change and Industrial Performance. *Enterprise Papers* 3. WIFO.
- Pilat, D. 2005.** Introduction and Synthesis. In: *Enhancing the Performance of the Service Sector*. Paris: OECD. 9–25.
- Pohl, H. J. 1970.** Kritik an der Drei-Sektoren-Theorie. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung* 3. 313–325.
- Rogerson, R. 2005.** Structural Transformation and the Deterioration of European Labor Market Outcomes. Arizona State University. Mimeo.
- Rowthorn, R. E. and J. Wells. 1988.** *De-industrialization and Foreign Trade*. Cambridge: Cambridge University Press.
- Schettkat, R. and L. Yocarini. 2003.** The Shift to Services: A Review of the Literature. IZA Discussion Paper 964.
- Singelmann, J. 1978.** *The Transformation of Industry: From Agriculture to Service Employment*. Beverly Hills, California: Sage.
- Stehrer, R. 2005.** Employment, Education and Occupation Structure: A Framework for Forecasting. wiiw Research Report 315. Vienna.
- Triplett, J. and B. Bosworth. 2003.** Productivity Measurement Issues in Services Industries: “Baumol’s Disease” Has Been Cured. In: *FRBNY Economic Policy Review*. September: 23–33.
- UNCTAD. 1995.** *Trade and Development Report 1995*. New York – Geneva.
- Van Ark, B. 2005.** Europe’s Productivity Gap: Catching Up or Getting Stuck? Paper presented at the Conference on “The Knowledge Economy – Challenges for Measurement.” December 8 to December 9. Eurostat. Luxembourg.

HIGH EMPLOYMENT WITH LOW PRODUCTIVITY?
THE SERVICE SECTOR AS A DETERMINANT
OF ECONOMIC DEVELOPMENT

Vidovic, H. 2002. The Services Sectors in Central and Eastern Europe. In: wiiw Research Report 289. Vienna.

Wagner, A. 1863. (New Edition 1984). Die Ordnung des österreichischen Staatshaushalts. Vienna: Brandstätter.

wiiw. 2005. wiiw Database on Foreign Direct Investment in Central, East and Southeast Europe: Opportunities for Acquisition and Outsourcing. May. Vienna.

Wölf, A. 2003. Productivity Growth in Service Industry: An Assessment of Recent Patterns and the Role of Measurement. OECD Science, Technology and Industry Working Papers 2003/7. Paris: OECD.

Wölf, A. 2005. The Service Economy in OECD Countries. In: Enhancing the Performance of the Service Sector. Paris: OECD. 27–61.

Annex

Table 1

Share of Service Activities in Employment						
%	EU-15			U.S.A.		
	1983	1993	2003	1983	1993	2003
Service sector	58.07	66.18	71.53	73.11	77.45	80.56
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	2.13	2.19	2.19	3.14	3.16	3.19
Wholesale trade and commission trade, except of motor vehicles and motorcycles	4.04	4.22	4.16	4.30	4.02	3.84
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	8.35	8.76	8.81	9.88	9.82	9.70
Hotels and catering	3.46	4.20	4.88	6.52	6.87	7.29
Inland transport	2.88	2.80	2.55	1.69	1.53	1.56
Water transport	0.23	0.14	0.11	0.05	0.04	0.04
Air transport	0.19	0.22	0.23	0.20	0.36	0.36
Supporting and auxiliary transport activities; activities of travel agencies	1.04	1.05	1.31	0.66	0.88	0.92
Communications	1.82	1.74	1.53	2.28	1.91	1.77
Financial intermediation, except insurance and pension funding	1.96	2.10	1.93	1.87	1.76	1.76
Insurance and pension funding, except compulsory social security	0.56	0.61	0.58	1.95	1.92	1.74
Activities auxiliary to financial intermediation	0.47	0.59	0.64	0.63	0.73	0.81
Real estate activities	0.62	0.86	1.03	1.21	1.25	1.29
Renting of machinery and equipment	0.18	0.25	0.33	0.34	0.42	0.45
Computer and related activities	0.47	0.78	1.43	0.41	0.74	1.31
Research and development	0.29	0.34	0.37	0.34	0.43	0.42
Legal, technical and advertising	2.18	3.41	4.11	3.07	3.73	3.95
Other business activities	2.09	3.13	5.13	3.10	4.84	5.69
Public administration and defense; compulsory social security	7.43	7.66	6.87	6.44	6.02	5.34
Education	5.90	6.45	6.78	10.62	10.67	11.26
Health and social work	7.22	8.69	9.56	8.54	10.31	11.37
Other community, social and personal services	3.28	4.04	4.75	4.84	5.30	5.93
Private households with employed persons	1.29	1.93	2.26	1.03	0.74	0.57
Manufacturing industry	32.58	27.99	24.37	23.67	20.28	17.38
Other sectors (Agriculture, forestry, fishing, mining, construction, gas and electricity)	9.35	5.83	4.10	3.22	2.27	2.06

Source: GGDC (2005), OeNB.

Table 2

Share of Service Activities in Value Added

% at current prices

	EU-15			U.S.A.		
	1983	1993	2003	1983	1993	2003
Service sector	61.34	68.17	72.01	68.10	72.80	76.28
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	1.69	1.75	1.78	2.57	2.35	2.53
Wholesale trade and commission trade, except of motor vehicles and motorcycles	3.77	3.85	3.62	4.87	4.62	4.70
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	4.39	4.45	4.42	5.38	4.96	5.08
Hotels and catering	1.76	2.10	2.41	2.51	2.48	2.51
Inland transport	2.77	2.64	2.33	2.13	1.61	1.43
Water transport	0.58	0.39	0.40	0.12	0.09	0.08
Air transport	0.37	0.37	0.41	0.39	0.53	0.53
Supporting and auxiliary transport activities; activities of travel agencies	1.25	1.28	1.64	0.57	0.71	0.73
Communications	2.39	2.67	2.59	3.30	3.10	2.97
Financial intermediation, except insurance and pension funding	4.47	4.39	4.14	2.44	2.57	4.43
Insurance and pension funding, except compulsory social security	0.93	1.10	1.13	2.20	2.38	2.54
Activities auxiliary to financial intermediation	0.48	0.56	0.77	0.80	1.27	1.91
Real estate activities	7.81	10.21	11.08	9.93	10.26	10.53
Renting of machinery and equipment	0.55	0.79	0.95	0.28	0.42	0.45
Computer and related activities	0.73	1.10	1.91	0.69	1.27	2.04
Research and development	0.38	0.42	0.38	0.30	0.44	0.49
Legal, technical and advertising	2.94	4.26	4.95	3.75	4.80	4.94
Other business activities	1.55	2.12	2.99	1.65	2.48	3.13
Public administration and defense; compulsory social security	7.94	7.74	6.98	9.91	9.33	7.91
Education	5.83	6.19	6.42	4.61	4.95	4.74
Health and social work	5.48	6.09	6.66	6.40	8.57	8.78
Other community, social and personal services	2.92	3.28	3.58	3.10	3.44	3.71
Private households with employed persons	0.35	0.41	0.47	0.19	0.17	0.13
Manufacturing industry	33.63	28.89	25.72	27.76	24.66	21.33
Other sectors (Agriculture, forestry, fishing, mining, construction, gas and electricity)	5.03	2.94	2.27	4.14	2.54	2.39

Source: GGDC (2005), OeNB.