Current Issues

International topics

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Services in the throes of structural change

Knowledge-intensive business services on an uptrend

Structural change in Germany set to continue (at a slower pace). The current recession is having a very severe impact on German industry. As a result, the share of services in total economic output will grow again substantially. With the contribution to gross value added increasing, the expansion of the services sector is bound to slow. In 2008, the share was about 69%. Ten years earlier it had already reached 68%. Twenty years ago, though, it was still only around 60%.

No two economies develop in the same way. Germany's strengths lie in the industrial sector. For this reason, the performance of Germany's tertiary sector will continue to be less outstanding than that of other, similarly developed countries. However, industrial companies produce more and more services not captured as such by statistical records, so the size of the tertiary sector is underestimated.

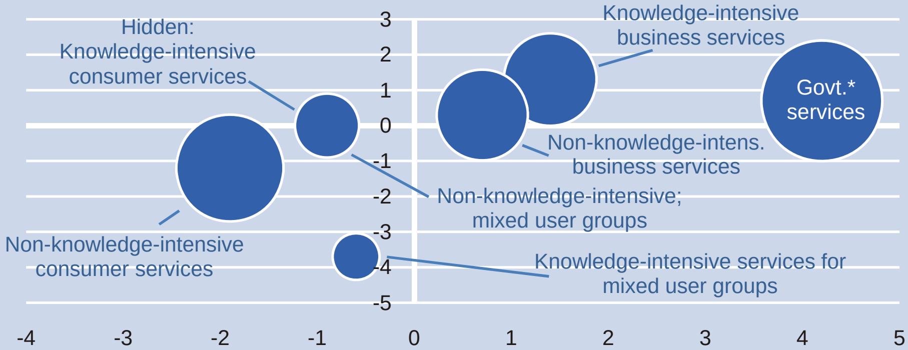
Services can be grouped in seven clusters. We have developed a new typology which assigns services to seven different clusters. The differentiating features are the users of the services and the knowledge intensity of their delivery. We have also identified an additional category embracing government services and heavily regulated public services.

Business services have developed better in recent years. Business services have benefited from globalisation and from industrial companies outsourcing certain tasks to specialised service providers. By contrast, consumer services are dependent on demand in the domestic market, which in Germany has been sluggish of late. Because the size of Germany's population is trending down, the impetus which the consumer segment can generate will remain limited.

Knowledge-intensive services are more expansionary than non-knowledge-intensive ones. Knowledge-intensive services benefit in Germany from this country's increasing activities in technology and knowledge-intensive fields. Moreover, knowledge-intensive business services often offer the potential to boost productivity in one segment in such a way that growth is subsequently enhanced in others.

Greater demand for business services

X-axis: Turnover - average turnover in all services in Germany, 2001-2007, % yoy
Y-axis: Employment - average employment in all services in Germany, 2001-2007, % yoy



Bubble size = Share of employment in services sector
* Government services and services subject to heavy government regulation are not fully recorded in terms of turnover and are thus not representative.

Sources: German Federal Statistical Office, DB Research

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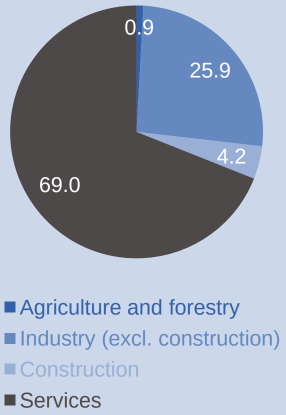
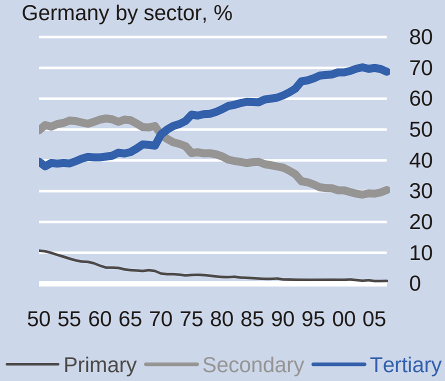
Services generate largest share of economic activity
Share of gross value added in 2008, %



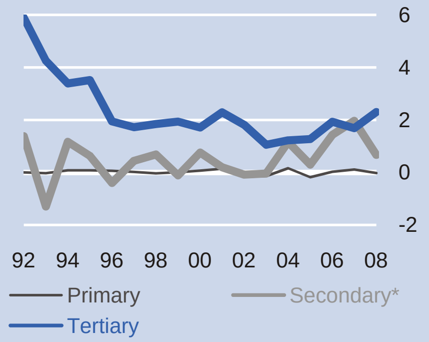
Source: German Federal Statistical Office 1

Services dominant since 1970
Contribution to gross value added in Germany by sector, %



Source: German Federal Statistical Office 2

Services driving growth in the economy
Contribution to growth of gross value added by sector, pp



* Poorer performance in secondary sector mainly attributable to construction; manufacturing industry performed better

Sources: German Fed. Statistical Office, DB Research 3

1. Services: A mixed bag

Ever since the late 1950s Germany has been in the process of becoming a services society. In 2008, the tertiary sector generated not only the bulk of value added in the German economy (69%). It also provided employment for the majority of the working population – i.e. just over 72% of the labour force, or 29 million people. During the upswing in the labour market in 2006 and 2007 alone, the sector saw the net creation of nearly one million jobs – the workforce as a whole grew by roughly the same amount.[1] What are the reasons for the increasing services bias of the German economy, and how does it compare with other countries in this regard? What is the structure of the German services sector and which segments are benefiting from the long-term trends? Before answering these questions in this report, we shall in the following briefly discuss the special features of services.

Features of services

First of all, one of the chief characteristics of services is that they are intangible. This feature goes hand in hand with the fact that they cannot be stored, barring a few exceptions (e.g. software stored on a data storage medium, effectively turning it into a tangible good). Given the fact that services cannot be stored they are usually produced and consumed simultaneously in accordance with the *uno-actu principle* or *"co-terminality"*. This co-terminality results in the fact that a consumer cannot test the service before purchasing it. Equally, the consumer cannot rely on past experience. While a parcel delivery company may have always delivered punctually in the past, it may fail to do so on the next occasion it executes the service – i.e. when it performs a new delivery job. By contrast, tangible goods are often mass produced – any two given products are nearly identical. With individually produced items there are at least technical details or lengths and weights which offer information on the utility of a product before it is sold. These are referred to as "search goods". On the other hand, services are regarded as "experience goods" or "trust goods" whose quality and utility in many cases cannot be measured objectively. As a consequence, the selling points of tangible goods and services differ; in the case of trade in services, trust in the capabilities of the service provider plays a key role.

Second, many services require interaction with the client. For the provision of a medical service, for example, the patient must be present to enable the doctor to make a diagnosis. This inclusion of the client in the provision of the service can assume various forms and may require either his physical presence or merely the furnishing of information or goods.

Statistical problems in the services sector

The services sector is a broad church: services can differ, for instance, in terms of their provider (private sector or public sector) and recipient (corporation or private individual), by their tradability on markets, and by the intensity of capital, knowledge and technology use in the production process, as well as by the degree to which they integrate factor inputs from external sources. This is why the "mixed bag" of services covers, for example, a haircut at the

[1] The terms worker and employee are used synonymously in this report and invariably refer to the entire working population and not just those who fall under the compulsory social-security plan.

hairdresser's, legal advisory on a company merger, providing access to a database or the issuing of an identification card by the municipal authority.

This heterogeneity must be borne in mind if services are to be assessed on an aggregated basis. For the extreme diversity of service offers is based on a variety of drivers and structures. Some statistical problems further compound the difficulties of capturing the tertiary sector: one is that Germany's Federal Statistical Office cannot use the same corporate surveys for service providers that it uses for industrial companies. There are no figures available on production, order intake or the like. Furthermore, the information is often outdated. Add to this problems of definition and classification: some industries are not clearly defined in the statistics. For example, there is no uniform definition for the logistics sector and it is not possible to clearly determine the size of the entire sector (which in terms of turnover, as in our definition, makes it one of the biggest in all of Germany no less – comparable to mechanical engineering). Classification problems crop up, for instance, when industrial companies produce and offer services. Maintenance and repair services offered by a mechanical engineering company, for example, are not recorded as services, but rather are classified under industrial production. Many services markets are not completely covered because services are produced internally by the company itself and not outsourced to specialised service providers.

In 2008, about two million employees whose work fell under the compulsory social-security plan were in typical services jobs in manufacturing companies. This means that nearly 30% of the jobs there are services-related. In this light, the "true" share of the tertiary sector in gross value added is probably well over 69%. The Federal Statistical Office's recent adjustments to its classification of economic sectors have slightly improved the situation, but the main problems in capturing services in the statistics have not been eliminated.

To take this heterogeneity into account we devote the fourth section of this report to a segmentation of the services sector and assign industries to appropriate categories. On this basis, we analyse the impact of major trends so we can trace the changes in the services world.

Symbiosis of tangible good and intangible service: Hybrid products

A product integrating the attributes of a tangible good and an intangible service is termed a hybrid. A hybrid product usually evolves from the offer of a tangible good. In many cases the service is initially only a necessary supplement which later develops into the core of the product, only then giving it its actual value. Numerous industrial products are only competitive when combined with related services.

The boundaries between product and service become blurred as the hybrid develops into an integrated solution. Suppliers of hybrid products include, for example:

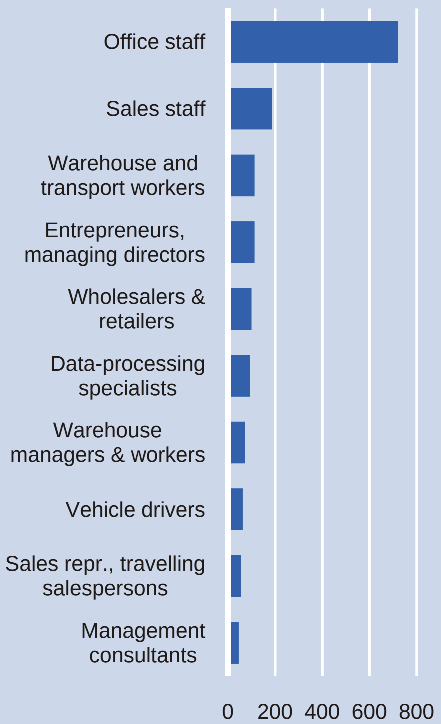
— A mechanical engineer who offers the buyer installation, maintenance and repair work as well as modernisation services.

— A chemicals company which delivers products classified as hazardous goods to its customers itself and assumes responsibility for disposal of chemical waste.

— A manufacturer of home exercise equipment that comes with software enabling computer-assisted monitoring and evaluation of the results.

Industry as a service provider

Manufacturing employees in compulsory social-security plan in 2008, '000



Services as a whole: roughly 1,960,000 persons

Source: Federal Employment Office 4

2. Structure: Change yourself!

What are the reasons for Germany's having started to turn into a services society? Factors from both the supply side and the demand side can be cited:

One argument on the supply side is that of technological progress. Just as productivity growth in agriculture led to the establishment of an industrial society, efficiency gains in industry resulted in input factors shifting from the secondary sector to the tertiary sector. Of course, technological progress also benefits service providers. However, there tends to be more scope for automation and rationalisation in industry. With many services, higher capital input achieves only limited productivity growth. Consider hairdressers, for instance, or lawyers. For architects or software programmers, however, such progress is quite conceivable. But there, too, the heart of the activity is the creative performance. The increase in industrial productivity meant that demand could be met with fewer

Changes in the statistics

January 2009 saw changes to the way economic sectors are classified in the statistics in the European Union. The figures used in this report will not be adapted to the new definition until 2010. This is why we take the old definition (NACE Rev. 1.1) as our guideline.

The following changes will be of particular relevance in the services sector:

— Publishing will be reclassified as a service and listed in the “Information and communication” section, and

— Recycling and refuse disposal will be classified under an expanded section of “Water supply”.

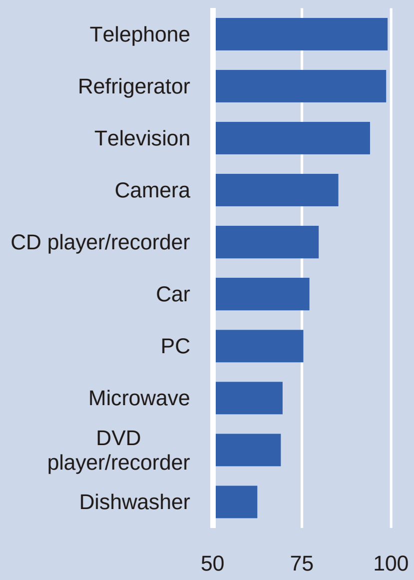
— Agriculture and mining will each have a section to which services linked with these segments will be assigned.

— Manufacturing will see the addition of a section called “Repair and installation of machinery and equipment”.

Besides these reclassifications outside the services sector there will also be certain changes within the services sector. However, we do not go into detail here because they do not provide any additional insights for the purposes of this study.

Demand will soon be saturated

Appliances found in German households in 2008, %



Source: German Federal Statistical Office 5

production factors. Redundant labour was able to find work in the services sector. The tertiary sector served as a last resort for people who could no longer find employment in the industrial sector.

Globalisation drives structural change

Moreover, globalisation compelled companies to tap efficiency potentials and specialise in order to meet the challenges of worldwide competition.[2] This, too, is having a bigger impact on industrial companies than on service providers since services are only tradable to a limited degree and competition from abroad is less significant as a result. To be able to concentrate more closely on their core competencies in production, companies often outsource services such as logistics or IT. Globalisation not only results in an international division of labour: it also leads to a division of labour between sectors, and in so doing drives the process of structural change. One aspect of this development is based on a purely statistical effect, however. For part of the change can be explained by the outsourcing of activities from industrial companies to specialised service providers. The value-added pattern remains virtually unchanged in this case, as it is merely assigned to a different sector of the economy.[3]

On the demand side, the structural change can be explained by the saturation of demand for many tangible goods in the industrial countries. Efficiency gains in industry enabled companies to meet continually higher demand levels. As incomes rise, demand increasingly focuses on services. Their saturation level is higher, or else they are not sought after until a certain minimum income threshold is crossed. For this reason, not only business-related services benefit but also consumer-related services. At the same time, productivity advances and strong labour representation have steadily shortened working times. This has boosted demand for leisure services, e.g. travel or entertainment.

Since the start of the new millennium, the process of structural change in Germany has slowed; over the past five years it has at times stalled or even gone into reverse slightly. One reason for this may have been the bursting of the internet bubble, which hit many service providers. Moreover, German industry benefited from the rapid growth of several emerging markets that became key export destinations. These economies still exhibit a considerable amount of pent-up demand for tangible goods. Furthermore, Germany benefits from the fact that these countries require capital goods that are among Germany’s top exports in order to build up their economies. By international standards, Germany outstrips the EU average in terms of value added in industry and construction while it falls short of the average in terms of services, with the gap having widened further over the past few years. In a comparison of the OECD members, too, Germany's tertiary sector is only average in its contribution to value added. A structural analysis shows that the contribution of the services sector is smaller as a whole in the German economy than elsewhere, without its composition differing significantly from that of other economies.

[2] Lately, business consultants have however increasingly called on companies to diversify their product ranges to a certain degree to ensure that they do not become overly dependent on any one segment.

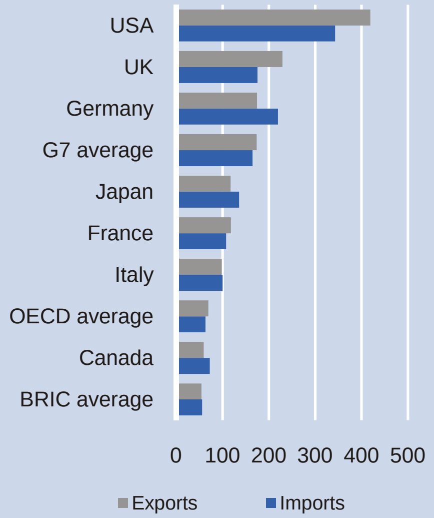
[3] See Ernst, G. and C. Kasten (1996). Dienstleistungen als Zukunft. Die Initiative “Dienstleistungen für das 21. Jahrhundert”. WSI Mitteilungen 02/1996.

Temporary industrial comeback in Germany
Share in gross value added, %

* Readings for 1997 are from 1999

Source: Eurostat 6

Germany: USD 45 bn deficit on trade in services
Trade in services in 2006, USD bn



Source: OECD 7

Services are predominant in national markets – goods in external trade

To assess the competitiveness of goods and services made in Germany one only needs to look at the current account and the services account. It is a known fact that Germany is the world's leading exporter only in terms of merchandise goods. In services, OECD members United Kingdom and, by a wide margin, United States, both leave Germany trailing behind. On services imports, Germany ranks in second place only slightly behind the US. Services imports are of such major significance for Germany mainly because Germans are the world's leading tourists: in 2006 one-third of services imports were attributable to tourism alone. No-one else spends as much on tourism as Germans. This enthusiasm for travelling is mainly responsible for Germany's chronic services account deficit.

As for German exports, however, only just under 14% were classified as services in 2008. This tallies with the average of the past 20 years. Of course, there are limits on the extent to which services can be traded. In Germany, the export ratio for services was a paltry 6% or so in 2005 – in manufacturing the ratio was close to 41%.[4] Merchandise trade is clearly dominant worldwide, too. Nonetheless, some WTO figures point to a relative weakness in Germany's tertiary sector: for 2007, the WTO puts Germany's share of global merchandise trade at 9.5%. By contrast, exports of services came to a mere 6.3%.

Germany appears to have lots of catching up to do in this area. In this respect, the EU services directive holds promise of improvements. Its aim is to simplify the provision of cross-border services. The target is to boost the services share in intra-European trade above the 20% posted in the EU-27 in 2007.[5] Even though the directive has been the subject of much criticism focusing particularly on the controversial country-of-origin principle, it is very likely to benefit Germany on the whole. Expect to see ambivalent effects, though: providers of less complex services entailing relatively high labour costs will be disadvantaged by the increase in competition – especially from Eastern European companies. However, many of these services are either excluded from the directive, e.g. the transport sector, or are virtually untradable at the international level. Demand for hairdressing services, for instance, is local – so they are unlikely to be seriously affected by the services directive. The areas most likely to be hit are border regions and sectors whose services are tradable at least to a certain extent and whose production is labour-intensive, e.g. industrial cleaning services.[6]

By contrast, knowledge-based sectors, such as R&D or management consultancy, benefit from an enlarged market for their services. However, these services can in many cases already be traded with relative ease. Apart from this aspect, the beneficiaries also include the "demanders" or users of the services – both

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[4] These export ratios are calculated on the basis of the Input-Output tables issued by Germany's Federal Statistical Office.

[5] A study conducted by the Netherlands Bureau for Economic Policy Analysis puts the growth potential for trade in services within the EU at as much as 30%, see CPB (2004). The free movement of services within the EU.

[6] See Frank, B. (2007). Internationalisierung von Dienstleistungen – Die EU-Dienstleistungsrichtlinie. WSI Mitteilungen 02/2007.

EU Services Directive

Directive 2006/123/EC was adopted in December 2006 and must be transposed into national law by December 2009. The objective of the directive is to simplify the provision of cross-border services, and thus achieve the freedom to provide services and the completion of the Single European Market. This should enable bureaucratic obstacles to be dismantled. To this end, member states will introduce uniform approval procedures along with an electronic processing system and increase the transparency of information. The long-term aim is to boost competition and lower prices for consumers.

Examples of problems that the directive is meant to defuse:

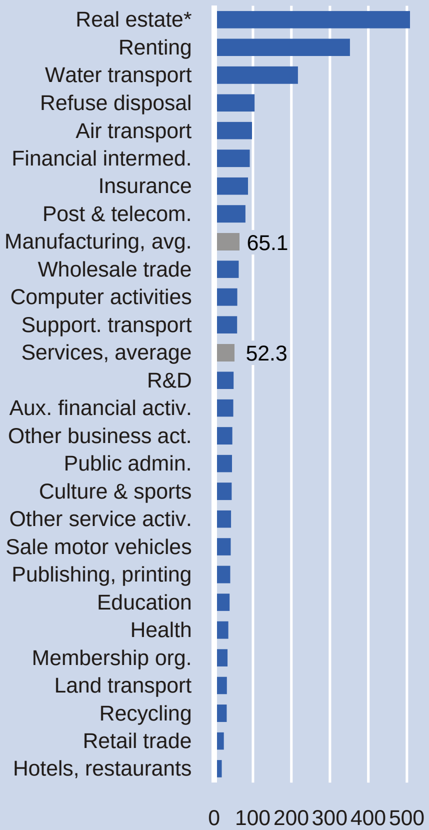
— Expensive authorisation procedures that do not grant approvals on a permanent basis but instead require every single order to be applied for individually;

— Protracted approval procedures that endanger the fulfilment of order-processing deadlines, which as a result can only be met if subcontractors from the host country are taken on board;

— Staff medical tests or safety training programmes that are only recognised if conducted in the host country.

Services are more labour-intensive than industry

Gross value added per worker by sector, Germany in 2006, EUR '000



* Excessive reading owing to statistical effect: (notional) rents for owner-occupied homes are included

Sources: German Fed. Statist. Office, DB Research 8

household consumers and businesses – on account of lower prices.[7]

Structural differences remain

No two economies develop in the same way. The results are structural differences from country to country. Germany's traditional strengths lie in the industrial sector. Large coal deposits, for example, nurtured the development of the iron and steel industry. An extensive railway network was established early on, which simplified the transport of goods and raw materials. The advantages attributable to specialisation have increased over time. Even though mass production and labour-intensive production frequently develop outside Germany, the country's global market leaders have – unlike their counterparts in, say, the United States or the United Kingdom – managed to hold their own in niche markets in many segments, such as mechanical engineering.

Further-reaching structural change would only make sense for Germany if it went hand in hand with productivity gains. In many countries the employment share of the tertiary sector is higher than in Germany. In these countries there tend to be far more simple, low-productivity services supplied. The average value added per worker is higher in manufacturing, though, than in services. For this reason, unwavering "tertiary expansion" for its own sake is not a sensible approach.[8] Nevertheless, the less sophisticated services often provide jobs for a large number of workers. Given Germany's elaborate social-security system, though, there are fewer incentives in Germany to take up a lot of the more simple jobs (e.g. liftboy). This limits the potential for employment in simple services.

However, there is also still potential for growth and scope for structural change in Germany in productive business services, which are key in the EU for 75% of the growth in labour productivity.[9] Since the boundaries between industry and services are becoming increasingly blurred, however, it is becoming more of a problem to calculate the value added generated by the different sectors.

3. Long-term trends beyond the financial crisis and economic cycle

Structural change is, by definition, a long-term development. Disregarding short-term ups and downs, it is long-term trends that influence the economy. Such trends determine which sectors were among the winners of the past few years and which sectors will prevail in future. Some trends have an impact on all segments, while others apply to only a small selection. The trends can be classified roughly in five categories.[10]

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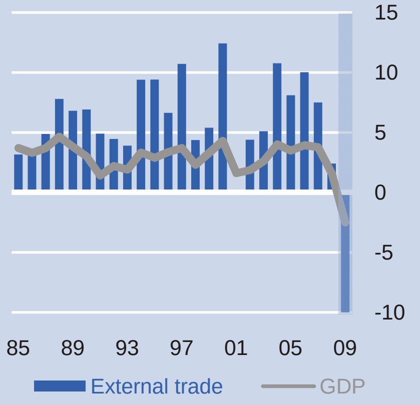
7 See Deutsch, K. G. et al. (2006). The EU services directive: Nightmare or opportunity? Implications for transatlantic business. AICGS Policy Report 25.

8 See Ehmer, P. (2008). Germany the service society – but don't forget the industrial sector! Deutsche Bank Research. Talking Point, March 6, 2008.

9 See European Forum on Business Related Services (2005). Report 2005.

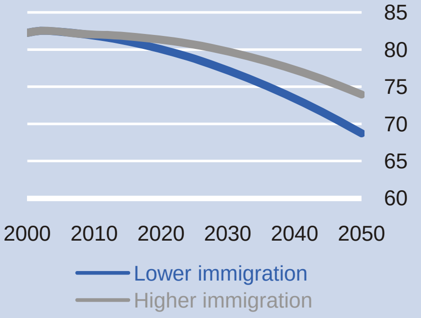
10 See Hofmann, J. et al. (2007). Germany 2020 – New challenges for a land on expedition. Deutsche Bank Research. Current Issues. October 3, 2007. Frankfurt am Main.

Global trade boomed
Growth of real external trade and GDP worldwide, % yoy



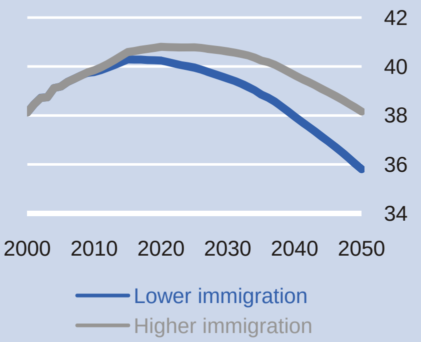
Sources: Oxford Economic Forecasting, WTO 9

Population decline since 2003
Number of inhabitants in Germany, m



Source: German Federal Statistical Office 10

Number of households: Still set to peak
Germany, m



Sources: German Fed. Statistical Office, DB Research 11

Globalisation

— The most important economic trend since the 1990s, globalisation, continues – with all its implications: world trade is growing faster than global GDP; according to Oxford Economics Forecasting its share of global GDP grew to about 30% in 2008 (1990: 16%). In all likelihood this will not apply for 2009: the WTO predicts a 10% decline in the volume of world trade.

— In Germany, globalisation is causing companies to focus more strongly on their core competencies in order to stay competitive. More and more processes are being automated. Industrial companies are outsourcing services to external specialists.

— Equally, economies are specialising in accordance with their relative advantages over others. Germany has strengths in high technology and continues to push the envelope in cutting-edge technology fields of industry and in knowledge-intensive services.

— Protectionist tendencies emerging in the course of the economic crisis will have only a short half-life, and in the medium term will give way to the march of globalisation once again, for the benefits of an international division of labour have not been fully tapped as yet.

Climate change

— Over the past few years the topic of climate change has found its way onto the political agenda and become a top-priority issue. Europe is a pioneer in climate protection, and within Europe Germany has assumed one of the leading roles. An increase in climate-related regulatory policy is thus likely to occur. In light of the current recession climate-policy objectives will be moved to the back burner, but only temporarily.

— Climate-policy-motivated regulation is focused primarily on making fossil fuels more expensive. The increasing scarcity of natural resources also leads to higher prices. The oil price rally in 2008 showed us that the times of permanently low energy prices are over. True, the price of oil did slump at the end of last year, retreating to a level of less than USD 50 per barrel. However, this is still nearly twice as high as the average price for 2000 to 2003. In the medium term the oil price is set to increase again to over USD 100 per barrel.

Demographics

— Germany has one of the fastest-ageing populations in the world. The country's population has already been falling since 2003. By 2020 it will be 1-2 million smaller than today, depending on the immigration scenario chosen. At the same time, we forecast that the number of households will increase since there will be fewer persons on average living under the same roof. 2020 is likely to see the number of households in Germany peak at 40.2 to 40.8 million (current total: 39.6 million). These developments will have wide-ranging repercussions, for example on the length of people's working lives, the national budget or people's needs and thus their consumption patterns.

— Demographic change is resulting in the shortage of skilled labour in Germany becoming more acute. The impact on the engineering professions is particularly pronounced. In future, though, the problem will spread to many professions on account of the fact that older workers will be retiring from active employment. A higher labour participation rate for women, a higher retirement age and increased immigration may at best weaken the impact of the problem.

Service typology

Knowledge intensity of service	User group		
	Knowledge-intensive services focused mainly on business	Knowledge-intensive services focused mainly on consumers	Knowledge-intensive services for mixed user groups
	Non-knowledge-intensive services focused mainly on business	Non-knowledge-intensive services focused mainly on consumers	Non-knowledge-intensive services for mixed user groups
	Government services and services subject to heavy government regulation		

Source: DB Research 12

Internet

— The internet boom towards the turn of the millennium ended abruptly with a correction in the early part of the 21st century. Since then, however, the significance of the internet has grown again steadily. Information is becoming more important, and markets more transparent. At the same time, the internet simplifies and intensifies interaction between businesses and consumers.

Other trends

— The project economy – temporary, collaborative value-creation processes in organisationally or legally separate companies – is gaining significance in Germany. Users are demanding increasingly sophisticated products, while product life cycles become shorter.[11] To satisfy this demand, companies are closing ranks and channelling their specific expertise into temporary cooperative ventures. This can be of particular benefit to Germany's *Mittelstand,* or small and medium-sized enterprises, since the often highly specialised participating companies obtain access to greater resources, e.g. know-how or funding, when they join together.[12]

— In future, demand will focus even more strongly on overall package solutions rather than on stand-alone products. Whereas in the past, for instance, production machinery was purchased from an industrial company whose own personnel installed, maintained and decommissioned it, the company will in future – and often already today – seek to obtain a turnkey solution for its "production problem". It will buy machines including installation, repair and modernisation etc. as one complete package. In so doing, purchasers can concentrate on their own competencies and satisfy their needs by dealing with a single supplier. These turnkey solutions are more individual than standard products; the client is integrated more intensively into the process of providing the service.

Knowledge intensity in services

We referred to data from the microcensus to differentiate between knowledge-intensive and non-knowledge-intensive services. Sectors in which workers have an above-average education are classified as knowledge-intensive. The reference value used is the average of the services sector in Germany as a whole. Thus, the segments identified as knowledge-intensive are only regarded as such in comparison with other services. We do not make comparisons with industry. Knowledge intensity is negligibly lower in the manufacturing sector than in the tertiary sector.

Our definition differs from others in that we factor in all of the working population instead of just employees contributing to the compulsory social-security plan. This approach allows us to include civil servants and the self-employed as well.

4. Types of service differ radically

To give the services sector more of a structure and to understand the different developments and keys to success in the sector we shall group the various component segments into logical units.

A whole litany of service typologies can be found in economic literature. Some of them classify services on the basis of their specific characteristics, e.g. according to the degree of customer integration when the service is being provided (contact intensity) or the degree of intangibility. Other approaches are geared to the mobility of providers and users or to the degree of standardisation. The criteria we consider particularly important are as follows:

[11] The sometimes extreme complexity of certain financial market products shows, however, that the trend towards demand for more sophisticated products will not continue forever. Instead, a certain optimum of complexity could emerge.

[12] Ibid, see p. 22ff. and PriceWaterhouseCoopers (2009). Managing the risks and rewards of collaboration. Technology executive connections. Volume 6.

Service clusters and their biggest sectors

Major sectors*	Wor-kers**	Turn-over**
	m	EUR bn
Knowledge-intensive services focused mainly on business		
Legal, business and management consultancy etc., banks	3.9	572.0
Non-knowledge-intensive services focused mainly on business		
Logistics, wholesale	3.7	1,075.9
Knowledge-intensive services focused mainly on consumers		
Pharmacies, churches and political parties	1.2	89.1
Non-knowledge-intensive services focused mainly on consumers		
Retail, hotels & catering, waste disposal	5.2	520.2
Knowledge-intensive services for mixed user groups		
Insurance, real estate	1.0	146.8
Non-knowledge-intensive services for mixed user groups		
Sale of motor vehicles, hotels, publishing	1.9	398.8
Government services and services subject to heavy government regulation		
Public administration, healthcare, education	9.5	64.9

* Major sectors of the respective cluster (based on employment in 2007)

** Figures (2007) refer to the cluster as a whole

Sources: German Fed. Statistical Office, DB Research 13

— *Users of the service*: At what stage in the value-added chain is the service found? Is it a business or consumption-related service?

— *Knowledge intensity*: How sophisticated is a given service, and how knowledge-intensive its production?

Using these characteristics it is possible to differentiate between clusters of services that share similar success drivers. In addition to “mainly business” and “mainly consumer” we also introduce a third category for the user criterion: “mixed”. This is where we group together services that are not clearly to be found mainly on the business side nor on the consumer side. Combined with the characteristics “knowledge-intensive” and “not knowledge-intensive”, six clusters emerge. The seventh cluster consists of services which are subject to heavy government regulation or are provided directly by the government. Among these we include public administration, the education sector, and healthcare and social work activities.

Up to now there has not been any uniform, scientific breakdown of services according to their user (business or consumers) in the literature. Most publications analyse only highly aggregated sector data.[13] This is why we decided to do our own assessment. To this end, the tax turnover statistics provide a good guideline, since they factor in the weights of individual subgroups of segments. By contrast, it is less of a problem to define services according to knowledge intensity. We defined knowledge-intensive services on the basis of the educational qualifications of workers in the individual sectors. A detailed list of our definitions may be found in the annex.

5. Services sectors show differing trends

This section looks at the seven clusters of services identified and shows how they developed between 2001 and 2007 in terms of both turnover and employment. The short timeframe was determined by the data at hand. It has to be borne in mind that this period does not cover the mainly IT-driven upswing marking the end of the 20th century, but the period does capture the correction at the beginning of the 21st century. As a result, the selected timeframe casts some sectors in a less than positive light than would be the case over a longer period. We will briefly discuss each of the sectors in question and make qualitative assertions on the impact of the long-term trends. Only selected sector-specific trends are highlighted, with the main focus being on the overarching “megatrends”. Our analysis does not claim to capture all the sectors in detail.

Knowledge-intensive services focused mainly on business

Knowledge-intensive services performed mainly for businesses developed somewhat better than the average recorded for services as a whole over the past few years. They represent about 20% of total services turnover and 15% of total services employment. It is particularly noticeable that the change in employment between 2001 and 2007 saw large differences between individual sectors within the cluster; the differences here are much larger than in any other

[13] For example: EFBRS (2005). 2005 Report. An overview of the literature on this topic can be found in Glückler, J. & I. Hammer (2008). A pragmatic service typology: capturing the distinctive dynamics of services in time and space. They reflect a service typology which is broken down to the NACE three-digit level.

Data availability in the services sector

In order to show how the individual sectors have developed over time, we use data on employment and turnover. The working population per sector is determined on the basis of microcensus data. Since no value-added data is available in the desired extended sector breakdown we use turnover data from the turnover tax statistics to be able to trace the respective monetary development. This means that if individual sectors are too small we have to estimate their turnover from average values. The following problems also arise with the use of the turnover tax statistics:

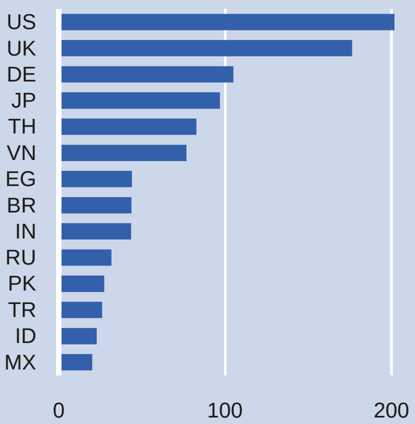
— Companies are categorised in a sector as an entire unit – and not individual company divisions in the respective subsectors.

— Some services are not subject to turnover tax or else they are provided directly by the government and thus are not even recorded in the statistics (e.g. medical, education and certain banking services).

— Despite these shortcomings we decided to include the results of the turnover analysis. Given the poor data quality, though, the results should be interpreted with caution.

More loans in rich countries

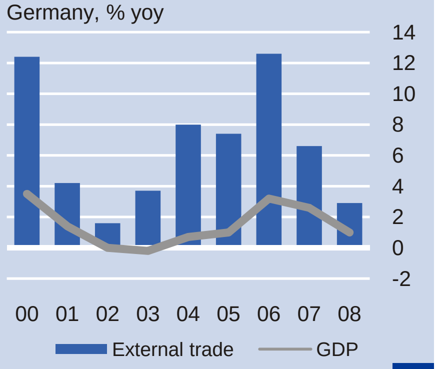
Loans to private sector in 2007, % of GDP



Source: World Bank 14

Trade growing faster than GDP

Growth of real external trade and GDP in Germany, % yoy



Source: Oxford Economics Forecasting 15

cluster. This is due in particular to the outliers from the IT sector. In IT there are some especially dynamic sectors which have only existed in their current form for a few years. Hardware consultancy and database activities grew their workforce by around 40% each year between 2001 and 2007, with the number of employees increasing nearly nine-fold in six years. On the turnover side, the most prominent activities are linked with financial intermediation, e.g. stock markets, as well as with sea and coastal water transport, the latter having benefited from the boom in container shipping since the beginning of the 1990s.

On the employment side, the banking sector, on the one hand, and consultancy, auditing etc., on the other, dominate the cluster of knowledge-intensive business services. Some 40% of employees fall into these segments. The fortunes of the business segments in this group largely rise and fall on cyclical developments. The above-average performance of this cluster is mainly attributable to globalisation.

The **banking sector** benefited from a global increase in the volume of capital transactions. Companies expanded their activities across national borders and began to meet foreign demand via exports, growing their production volumes and thus their investment and funding requirements. The demand for credit rose. *Financial deepening* is the term used to describe the process in which financial assets grow at a faster pace than economic activity.[14] The higher economic growth induced by globalisation was actually outstripped by the expansion of lending to the private sector. All in all, the lending volumes in developed economies claim a greater share of GDP than in developing countries or emerging markets. There were some cases of overshooting in the banking sector, though.

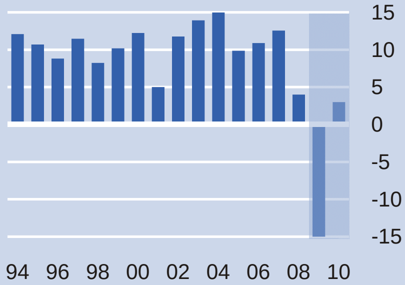
In the more stable retail banking segment the demographic trend favours the financial industry. A growing number of pensioners is set against a steadily falling number of contributors paying into the system. This worsening ratio has resulted in private provision for old age gaining a higher profile. The financial industry is an important partner in this respect. The phenomenon of climate change will pave the way for special financial products which, on the one hand, will simplify adaptation to global warming, e.g. weather derivatives, and on the other hand will slow it down, e.g. investments in renewable energies.

Water transport is equally a beneficiary of globalisation. Much of the cross-border transport of goods – over 90% by volume – is performed by ship. For Germany, it is necessary to differentiate between shipping on the high seas and inland waterways: goods turnover in inland shipping stagnated between 1995 and 2007, whereas it grew by over 50% in the ocean-going segment. Container turnover in fact trebled. One reason for the weaker performance of shipping on inland waterways is the so-called goods structure effect: fewer and fewer bulk goods and more and more high-quality products are being shipped, and these use other transport routes (road or rail). Moreover, inland shipping is more vulnerable to extreme weather events (e.g. low water levels in unusally hot summers). Besides, climate change affects shipping indirectly via regulatory intervention to reduce CO_2 emissions. After the energy sector, the transport sector is however still ahead of

[14] See Schildbach, J. (2008). European banks: The silent (r)evolution. Deutsche Bank Research. EU Monitor 54. Frankfurt am Main.

Container shipping recorded longlasting boom

Container handling (TEU*), DE, % yoy

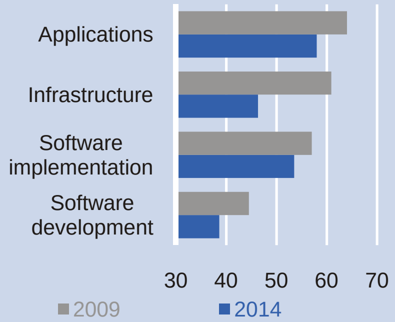


* Twenty foot equivalent units

Sources: German Fed. Statistical Office, DB Research 16

IT outsourcing on the increase

Share of activities performed in-house at companies surveyed (n=117), %



Source: Capgemini 17

Tips for reading the charts

The x-axis shows the change in turnover of the respective sector in comparison with the average of the group. Similarly, the y-axis shows the change in the working population. The observation period is always 2001-2007 and the readings are given as the percentage change vis-à-vis the year-earlier figure. The size of the bubbles shows the relative size of the sector in the group in 2007 (in terms of the number of workers). The footnote indicates how the group has developed in comparison with the services sector as a whole.

Example:

Turnover in Sector 61.1 (Sea and coastal water transport) grew by 12.7 percentage points more than average turnover in this services group. Employment exhibited 1.6 pp stronger growth. Some 0.7% of the employees in this group work in Sector 61.1 (this is the reason for the small size of the bubble). The information in the footnote shows that the sector performed 14.1 pp better in terms of turnover and 2.9 pp better in terms of workers than the average of all German services.

This overall average is 3.2% p.a. for turnover and 1.6% p.a. for workers.

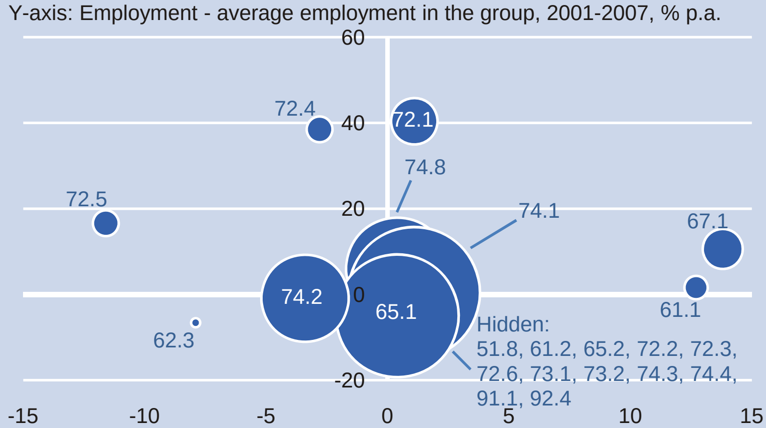
The classification of sector names by NACE numbers can be found in the annex.

industry as the sector with the biggest carbon footprint in the EU. Thus it is to be expected that sea transport will come to be included in emissions trading.

Business services, such as consultancy, auditing, engineering offices or advertising, cover services which often used to be performed in industrial companies themselves. The stiffer competitive pressures growing with globalisation have resulted in these jobs being outsourced to external providers. The services offered, e.g. legal, business and management consultancy, are sought after in temporary cooperative ventures. For this reason, this segment is a beneficiary of the trend towards a project economy. One of the issues suitable for being tackled by several companies in temporary collaboration, for instance, is climate change. After all, climate change is a very complex issue for which many companies require advice and for which the parties involved must work together on an interdisciplinary basis. This can also benefit the **research and development** segment, for many areas give rise to an increased need for research requiring the expertise of external institutes. Companies which demand consultancy services in order to be able to respond to the changes facing many sectors are a boon to business services. As an example, specialised consultancies focusing on energy efficiency or emissions trading may tend to benefit.

IT segments are engine of employment growth

X-axis: Turnover - average turnover in the group, 2001-2007, % p.a.
Y-axis: Employment - average employment in the group, 2001-2007, % p.a.



- See tips for reading chart on page 12 – Bubble size = employment share in the group in 2007
- Compared to services sector as a whole:
Turnover +1.4% p.a. Employment +1.3% p.a.

Sources: German Federal Statistical Office, DB Research 18

The **IT segments** are very dynamic with high innovation intensity. In 2005, product innovations – as in telecommunications – generated close to 28% of sector turnover, contributing the largest share by far (services as a whole: 10%).[15] Data processing is also gaining ground thanks to the trend towards a project economy and the growing significance of the internet. Expanded application areas of new media technologies boost demand for software and data-processing solutions from the consumer and commercial sectors. Companies can increase their competitiveness by using information technologies. A topical example is so-called *cloud computing*, which lowers a company's own software costs and draws on the capacities of service providers. The latter make applications available and

[15] See ZEW (2007). Branchenreport. Ergebnisse der deutschen Innovationserhebung 2006.

store data on external servers. IT solutions are now to be found in nearly all companies: manufacturing plants automate production, logistics specialists manage entire value chains with computer programs. According to a survey by Capgemini the share of self-generated performance in corporate IT expenditure is already down to only around 60% – and the trend is falling.

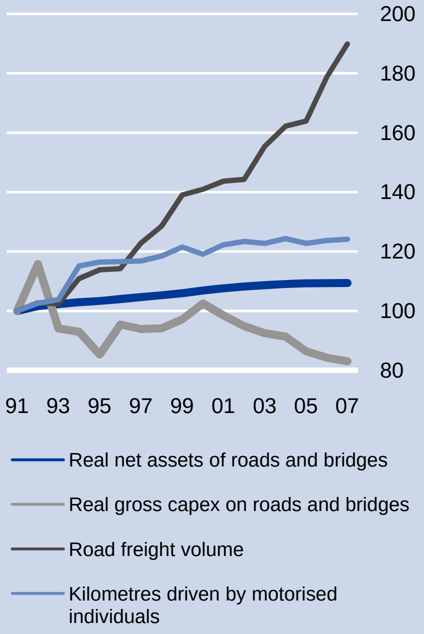
Non-knowledge-intensive services focused mainly on business

Turnover and employment in non-knowledge-intensive business services roughly match the average of the services sector as a whole. The segments of this cluster generate nearly 38% of total turnover and 14% of employment in the tertiary sector. The large difference between these two readings suggests that this area is particularly capital-intensive. This is mainly attributable to several wholesale segments and to leasing/renting of machinery – with turnover of over EUR 1 million per worker these industries beat the average by a wide margin.

Logistics and wholesale reliant on cyclical developments

At last reading, non-knowledge-intensive business services performed much more homogeneously than did more knowledge-intensive services. Outliers on the positive side include staffing services and business-related recycling services, the latter having benefited from the industrial boom over the past few years. Jobs were lost especially in parts of the wholesale sector and in the printing industry. Logistics is the biggest industry in this cluster – with over one-third of all services workers employed in this business. The wholesale trade comes in second place, followed by industrial cleaning. Since it is companies that demand the services, the overall growth of the economy is the main key to success in this cluster, too.

Road transport: Supply and demand drifting apart
1991=100



Sources: DIW, DB Research 19

There is no doubt about it: **logistics** is the biggest beneficiary of globalisation. The logistics segment is enhanced by Germany's central location in Europe, its transport-intensive heavy industry with a polycentric economic structure and the considerable degree of openness in its economy.[16] However, these location advantages stand to face problems as climate change unfolds. For regulatory reasons, policymakers will tend to intervene in market mechanisms via fuel taxes or, say, truck tolls, and this will negatively impact logistics specialists. Only part of the toll revenues are being invested in the expansion of transport infrastructure. Because of the funding bottlenecks facing the public sector in particular there is a growing infrastructure gap. This has a harmful effect on one of Germany’s location advantages (the good infrastructure). Furthermore, the sector stands to be hurt by the demographic trend. Some 30% of the people who drive a truck for a living are over 50 years old, and not enough new drivers are joining their ranks. It is obvious that this trend will start to weigh on the sector in just a few years. By contrast, the trend towards a comprehensive logistics approach should stimulate activity in the field. This trend towards so-called contract logistics enlarges the growth opportunities of the segment.

The **wholesale trade** is very heterogeneous. On the one hand numerous products are being sought by industrial companies. This applies in industrial B2B commerce to commodities or machinery, for instance. On the other hand, there are also retailers taking up goods in consumption-related wholesale segments, e.g. food, clothing or

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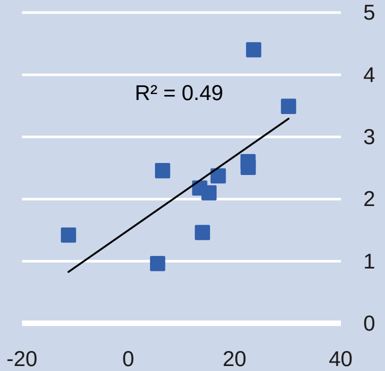
[16] See Ehmer, P. et al. (2008). Logistics in Germany: A growth sector facing turbulent times. Deutsche Bank Research. Current Issues. November 27, 2008. Frankfurt am Main.

consumer electronics. BGA, the Federation of German Wholesale and Foreign Trade, says about 50% of turnover is generated in each of these two areas. While both user groups come from the corporate sector, there are differing drivers in the segments: on the one hand, the overall investment climate, on the other, the consumer climate. Globalisation resulted in the profile of wholesale being raised initially because it increased the number and variety of goods traded. Thanks to intermediate wholesalers the production plants did not have to contact all the users individually to sell their products; they reduced the interfaces to their customers to one single channel.

Wholesale enlarging its range of services

Looking at the situation from another angle, the internet and the growing degree of e-commerce as well as economies of scale in retail business and industry are jeopardising the wholesaler's role. Digital trading platforms are increasingly gaining ground for standardised products, circumventing the intermediate stage of the wholesaler in order to save costs. The sandwich position between industry and retail is critical, for the wholesaler's margin may reduce the returns achieved at the upstream and downstream links of the value chain. It is therefore important that wholesalers achieve critical mass in order to secure price advantages and thus create incentives to dissuade others from leapfrogging their services. Wholesale faces not only horizontal competition but also vertical competition. For this reason wholesalers are partly interpreting their role anew, diversifying their product and offering goods-related services. These include, for example, the delivery and repair of goods or the recycling/disposal of waste and scrap materials.

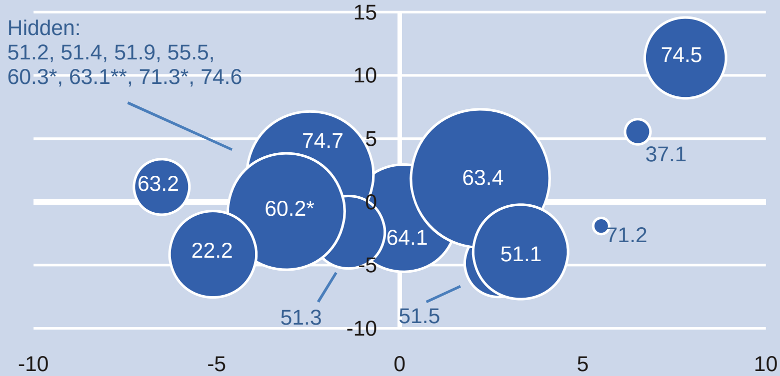
Staffing services dependent on economic cycle
X-axis: Turnover, 2001-2007, % yoy
Y-axis: Nominal GDP, 2001-2007, % yoy



Sources: German Fed. Statistical Office, DB Research 20

Because of their nature, **staffing services** are of course extremely dependent on how the economy develops over the cycle. Obviously, temp agencies can only place staff if, for instance, industrial companies require additional personnel to cope with a larger production volume. There is a clear correlation between the turnover of this sector and GDP. The simplification of the regulations on the hiring-out of workers is good for temporary employment services: January 1, 2004 saw the dismantling of several legal hurdles which affected the hiring of temporary staff. In the current situation, however, staffing services providers have been dealt a heavy blow because of production declines in industry.

Staffing services expanding
X-axis: Turnover - average turnover in the group, 2001-2007, % p.a.
Y-axis: Employment - average employment in the group, 2001-2007, % p.a.

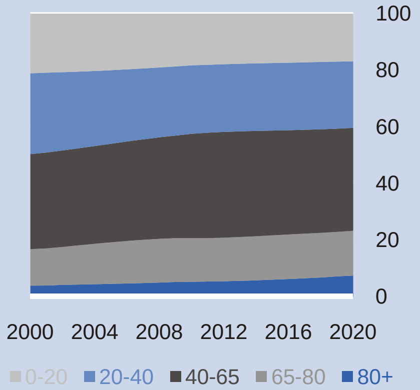


- See tips for reading chart on page 12 – Bubble size = employment share in the group in 2007
- Compared to services sector as a whole:
Turnover +0.7% p.a. Employment +0.3% p.a.

* Estimate of 2007 turnover
** Turnover 2002-2007

Sources: German Federal Statistical Office, DB Research 21

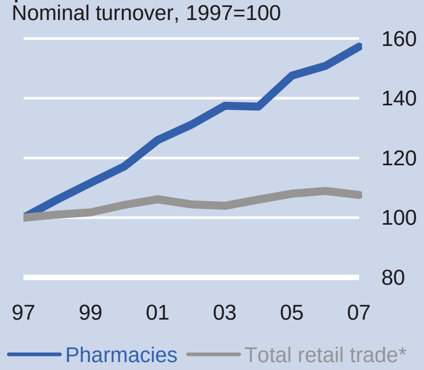
Seniors cohort growing
Population cohorts in Germany, %



Net migration: 100,000 persons per year

Source: German Federal Statistical Office 22

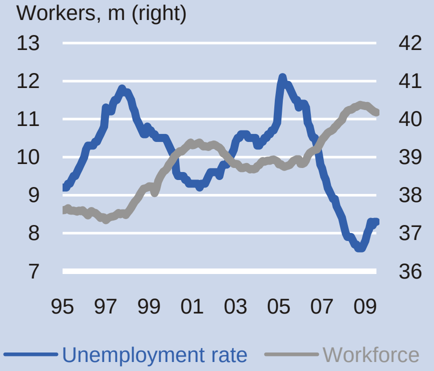
Higher turnover at pharmacies
Nominal turnover, 1997=100



* Excl. motor vehicle sales and filling stations

Sources: German Federal Statistical Office, ABDA 23

Upswing in economy: More work ...
Unemployment rate, % (left)
Workers, m (right)



Source: Bundesbank 24

Knowledge-intensive services focused mainly on consumers

Knowledge-intensive services that are focused mainly on consumption did not boost turnover as much as others in the tertiary sector on average, but roughly matched the average in the creation of jobs. This category has an extremely low weighting in Germany's services environment. The related segments generate only 3% of turnover and less than 5% of employment. The main employers are pharmacies, travel agencies and tour operators. But churches, lobbies and political parties also belong to this cluster in a broader sense of the term.

This part of the tertiary sector is very heterogeneous, with the success of the member segments driven by diverse factors. For instance, travel agencies and tour operators are subject to the development of disposable income and private consumption. Insurance agents' business is additionally shaped by demographic changes: private provision for old age may boost the number of life insurance policies written. By contrast, thinking in terms of turnover or value added does not make sense in relation to lobbies or churches. These branches depend on other societal developments.

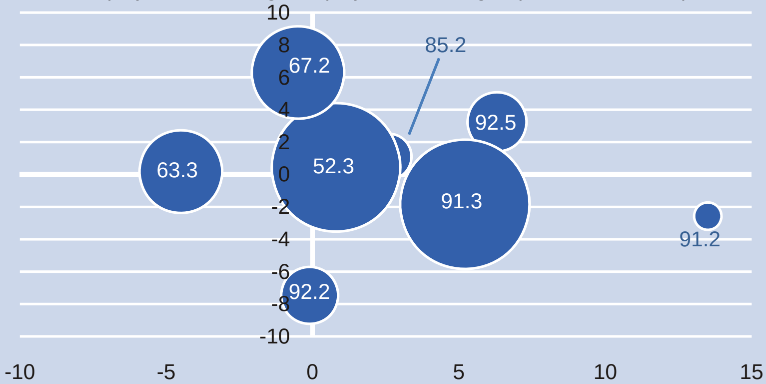
From a business point of view, **pharmacies** are the members of most interest in this cluster. Pharmacy performance hinges strongly on demographic trends, with their business less dependent on cyclical patterns. Both the increased level of health consciousness and the ageing of the population enhance this segment. According to a forecast of Germany's Federal Statistical Office the over-65 segment of the country's population will see its share increase by 3 percentage points (pp) by 2020, to about 23%. This means the size of the cohort would increase by nearly three million people. This is of significance to pharmacists because this cohort requires about three times the amount of drugs and medications as those who are younger than 65.[17] Pharmacists were able to boost their turnover much more strongly than the retail sector as a whole (48% as opposed to 6% in the past ten years), with the segment benefiting from the deregulation of the pharmacy market. Within the past few years, for example, the bans were lifted in Germany on ownership of more than one pharmacy and on mail-order distribution of drugs.

[17] See Perlitz, U. (2008). The German pharmacy of the future: More systems – more competition – cheaper products. Deutsche Bank Research. Current Issues. January 20, 2009. Frankfurt am Main.

Growing sector: Insurance agents

X-axis: Turnover - average turnover in the group, 2001-2007, % p.a.

Y-axis: Employment - average employment in the group, 2001-2007, % p.a.

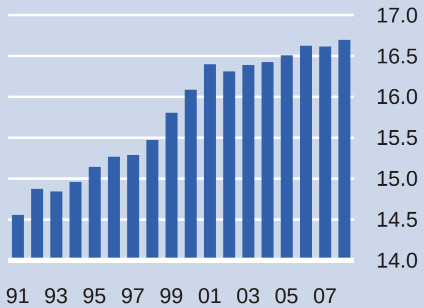


- See tips for reading chart on page 12 – Bubble size = employment share in the group in 2007
- Compared to services sector as a whole:
Turnover -0.9% p.a. Employment -0.1% p.a.

Sources: German Federal Statistical Office, DB Research 25

... and more money ...

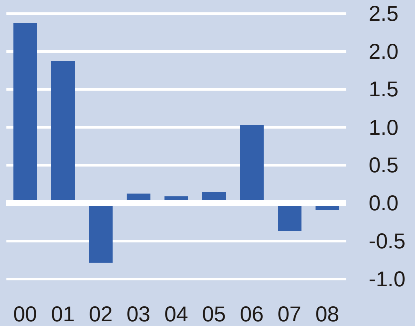
Disposable income (real) in Germany, EUR '000



Source: German Federal Statistical Office 26

... but consumption is flat

Private consumption in Germany, % yoy



Source: German Federal Statistical Office 27

Non-knowledge-intensive services focused mainly on consumers

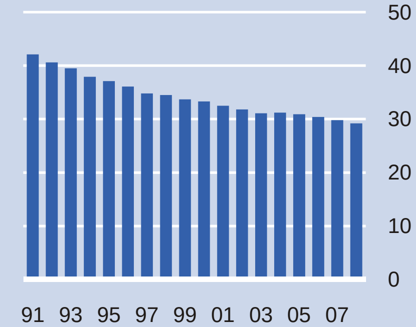
Relatively unsophisticated consumer services did not fare as well in the recent past as the services sector as a whole. Also, the number of workers increased at a below-average pace. This cluster represents about one-fifth of all services in terms of turnover and employment. There are outliers both to the upside and to the downside on the employment score owing to some of the retail segments.

Retail dominates the group in terms of employment: over half of all services workers have a job here. The next biggest segments are gastronomy, and other consumer-related services, e.g. hairdressers, laundries and fitness centres. This cluster is relatively homogeneous, with the key drivers being the trends in disposable income and private consumption. Neither factor has developed very positively in the recent past. True, unemployment did fall heavily especially in 2006 and 2007. And real disposable income has increased by nearly 15% since German reunification. However, much of the growth occurred around the turn of the millennium. Since 2001, disposable income has flatlined. Similarly, private consumption grew only in the year prior to the VAT increase, on account of purchases being brought forward. In the other six of the past seven years consumption stagnated or in fact declined. The regional aspect is very important for these segments. Customers must (with few exceptions, e.g. in mail-order business) visit the provider of a service in person. This stops services from being exported and increases their dependence on domestic demand.

The weakness of private consumption has weighed on German **retail sales** for years. Retail sales in the narrow sense (excluding vehicle sales, filling stations and pharmacies) have suffered from the saturation trends seen in the provision of tangible goods, e.g. clothing or furniture. Increments in income tend to benefit other sectors, such as tourism or the entertainment sector (theatre, concerts etc.). During the days of German reunification retail turnover still accounted for 40% of private consumption, whereas

Retail segment losing importance for consumers

Retail turnover* as % of private consumption in Germany



* Retail in the narrow sense (excl. vehicle sales, filling stations and pharmacies)

Sources: German Federal Statistical Office, HDE 28

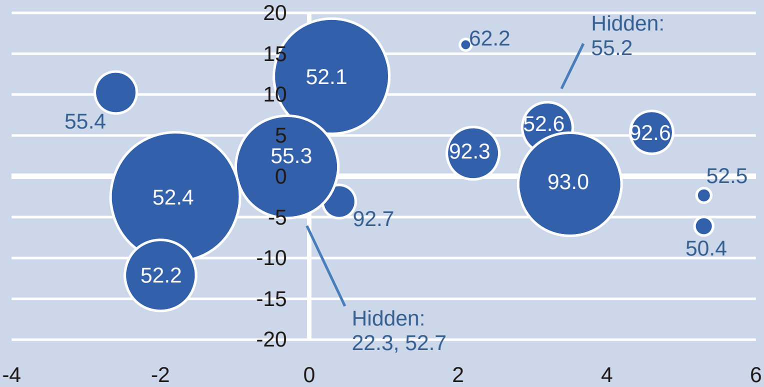
today the share is less than 30%.[18] These saturation effects limit the long-term growth potential of the segment.

Mail-order business is being enhanced by the growing significance of the internet. However, online shopping competes concurrently with bricks-and-mortar segments of retailing, so the sector as a whole cannot expect to gain any big advantages here. In the long term its business fortunes are tied to private consumption (even though retail's share of consumption is falling). And private consumption cannot be expected to make any major surges – especially considering the demographic situation.

All in all, turnover in the **gastronomy** sector (restaurants and bars) followed disposable income patterns relatively closely. As in the retail sector, the long-term driver is the propensity to consume. In this respect, regulatory interventions which influence the amount of wealth available for consumption – such as income tax and value-added tax, healthcare funds and social-security contributions – also have an impact on the development of the segment.

Retail segments differ considerably

X-axis: Turnover - average turnover in the group, 2001-2007, % p.a.
Y-axis: Employment - average employment in the group, 2001-2007, % p.a.

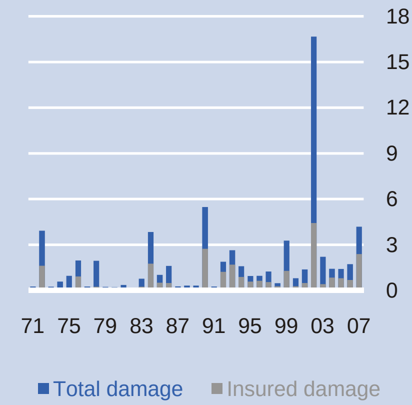


- See tips for reading chart on page 12 – Bubble size = employment share in the group in 2007
- Compared to services sector as a whole:
Turnover -1.9% p.a. Employment -1.2% p.a.

Sources: German Federal Statistical Office, DB Research 29

Damage claims on the increase

Damage caused by natural disasters, DE, EUR bn at 2007 prices



Source: Münchener Rück 30

Knowledge-intensive services for mixed user groups

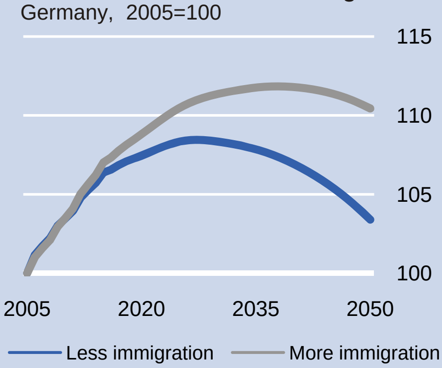
It is only natural that the services clusters for mixed user groups are more heterogeneous than others. For in this case both investment activity and private consumption play a role as driving forces. In descending order of size, the sectors belonging to this category are: insurance, real estate, rail and scheduled airline traffic, and telecommunications.

Knowledge-intensive services that are used by both companies and households performed significantly worse on the employment score than German services on average. The number of workers decreased here by 2.1% p.a.; however, the weight of this category is low at only 4% of the total. Real estate activities on a fee or contract basis rank well in terms of employment, whereas real estate activities with own property trail behind. In terms of turnover, rail transport stands out in a positive light.

In the case of **insurance and pension funding** – and here the reinsurance segment in particular[19] – climate change is of major

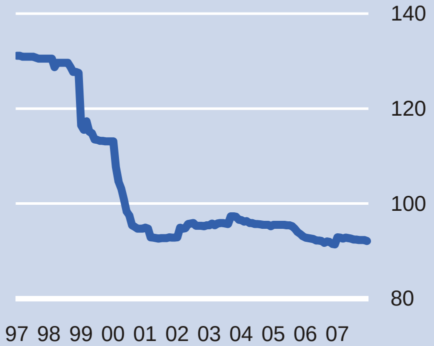
[18] See Auer, J. (2006). Perspektiven des Einzelhandels sind limitiert. Deutsche Bank Research. Aktuelle Themen 371. Frankfurt am Main.

Housing demand set to increase for time being
Germany, 2005=100



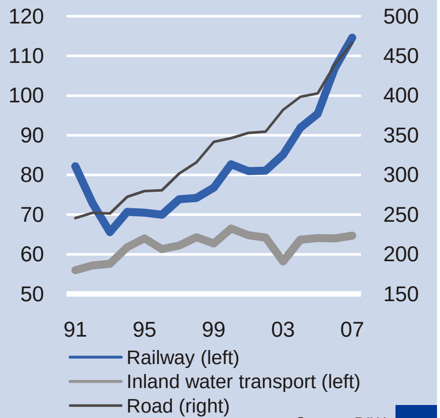
Source: DB Research 31

Telephony cheaper after liberalisation
Index, 2000=100



Source: German Federal Statistical Office 32

After road, railway is a winner in modal split
Goods traffic in Germany, Tonne-kilometres, bn



Source: DIW 33

significance. Risks inherent in more frequent and more violent extreme weather events are, for one thing, hard to predict and, for another, are often linked with large payments. Viewed from this perspective, the trend hurts the segment. However, insurers can compensate this by charging higher risk premiums. The reason is that the demand for insurance against these specific risks is rising – and thus also the scope for pushing through higher risk premiums. Innovative financial market products for spreading the risk among the market participants are instrumental in enabling the immense risks to be insured in the first place. The costs of a custom-tailored insurance policy for individual companies would be prohibitively high otherwise.[20] The demographic trend favours the sector since it forces the issue of private provision for old age. This promotes the writing of life insurance policies.

The **real estate and housing sector** will be impacted in the long run by the demographic challenge. Demand for living accommodation decreases in tandem with a decline in population. While there is already a trend towards smaller households, the number of households is also going to shrink – albeit with a certain time lag. According to our forecast, demand for living accommodation will peak either at the end of the 2020s or 2030s, depending on the prevailing immigration scenario.[21]

Telecommunications is profiting from the increasing prevalence of technology in everyday life and from the increasingly close-knit networks linking business operations. This segment is one of the beneficiaries of the project economy since it is the very enabler of collaboration between companies in different locations. The once heavily regulated telecommunications market has been undergoing a process of deregulation since 1998. The intensification of competition over the past ten years has led to a roughly 30% decrease in the price of telephone services.[22] But the fiercer competition has brought pressure to bear on the segment's turnover and employment, accordingly: 30% fewer workers had a job here in 2007 than in 2001.

The quality of regulation is an important factor also in **rail transport**. This is another area where major steps were taken towards liberalising the market. As a result, private railway companies have boosted their traffic by 40% p.a. since 2002. In goods traffic their market share has thus risen from 7% to 20%. The railway's share of national goods traffic in Germany increased at an above-average pace: from 2001 to 2006 it was boosted by around one-third. In **air traffic** there have also been growth stimuli from the regulatory side: the EU is seeking to achieve its goal of a Single European Sky from 2014. The result would be optimised flight paths and cost savings.

Globalisation has favoured rail and air transport as means for moving goods. Like the transport sector as a whole, these modes of

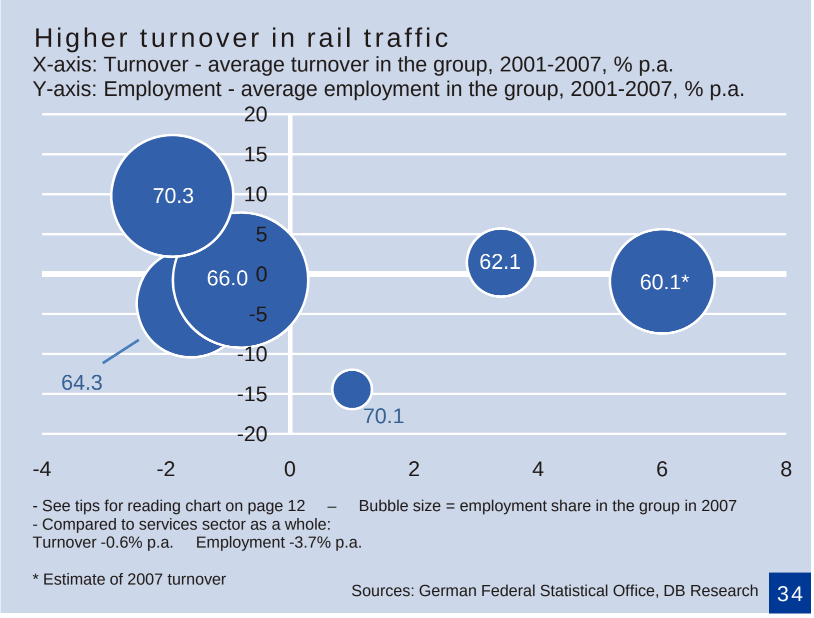
[19] Reinsurers are grouped in this cluster even though they are clearly providers of business services, the reason being that the sector is not further differentiated at 3-digit level.

[20] See Weistroffer, C. (2007). Coping with climate change. The role of financial markets. Deutsche Bank Research. Current Issues. November 15, 2007. Frankfurt am Main.

[21] See Bräuninger, D. et al. (2007). Housing finance in Germany: Four major trends. Deutsche Bank Research. Current Issues. November 1, 2007. Frankfurt am Main.

[22] See Heng, S. (2008). Telecom regulation in the EU facing change of tack. Competition requires a clear policy line. Deutsche Bank Research. E-conomics 66. Frankfurt am Main.

transport are increasingly in the cross-hairs of the climate debate, albeit in a different light: air traffic takes perhaps the heaviest toll on the climate because of related emissions in the upper atmosphere. By contrast, railway networks are an environmentally friendlier method of transporting goods and rate better on the climate score. Air transport is to be included in the EU emissions trading scheme by 2012 at the latest according to current plans.



Non-knowledge-intensive services for mixed user groups

Simple services for businesses and private individuals performed only slightly below par for services as a whole in the recent past. They employ about 7% of workers and generate 14% of turnover in the tertiary sector. On the employment side, a prominently positive example is sales of motor vehicle parts. In terms of turnover, motion picture and video activities are an outlier on the negative side.

The biggest employers in this category of services are motor vehicle dealers and related segments (vehicle repairs and sales of vehicle parts). These are followed by hotels, ahead of publishing and waste disposal. All things considered, this part of the services spectrum is in itself less homogeneous than the categories that are mainly focused on a single user group.

A significant long-term trend bearing on the automobile industry, and thus the **sale of motor vehicles**, is climate change and the design of environmental policy. The sector is impacted by regulatory interventions designed to increase the energy efficiency of vehicles. After all, the targeted objectives can only be achieved using new, expensive technologies. There are probably limits to the possibilities for passing on the costs of these technologies to the vehicle buyers, so the suppliers' margins could shrink.[23] However, the number of cars on German roads was still climbing at last reading, even though it has slowed to only a snail's pace.[24]

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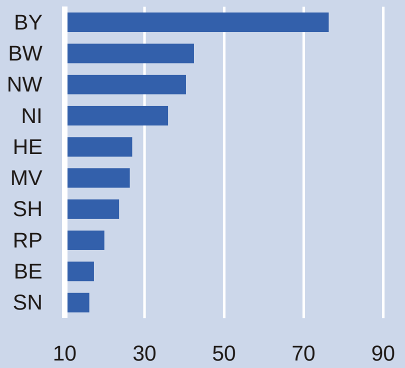
[23] See Heymann, E. (2009). New era unfolding for the automobile industry. Deutsche Bank Research. EU Monitor 62. Frankfurt am Main.

[24] Part of the reason for the declining growth might be that there is already a very large ratio of cars to inhabitants in Germany. In the EU-15, Germany ranked second in 2007 at 566 cars per 1,000 inhabitants (EU-15 average: 513).

Southern Länder hold the lead

Overnights* in top 10 German states in 2007, m



* Overnight stays in lodgings with nine or more beds, incl. camping

Source: German Federal Statistical Office 37

Hotels benefit from rising national incomes. Persons with an extensive range of consumer durables tend to spend their money on, for instance, more frequent and longer holiday trips to more distant destinations. Tourism can absorb additional income. But hotels also generate a not-to-be-underestimated share of their turnover from business travellers. According to Oxford Economics Forecasting, the share of businesss travel in total tourism turnover in Germany comes to about 20%.

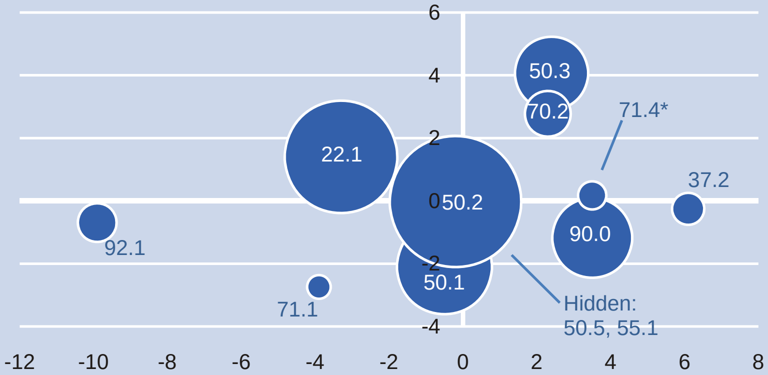
Germans are considered to be the world's leading travellers and they spend the most money on tourism worldwide (close to 10% of global spending on travel). Tourism businesses in Germany benefit from the fact that the Germans' enjoyment of travelling often takes them to domestic destinations. Foreign guests account for only 15% of the total number of tourists in Germany, the lowest reading in the EU. At the private level, demographic changes will boost the growth of health tourism: older people particularly favour destinations in coastal areas and in the mountains for spa and wellness holidays. Climate change is generally altering the attractiveness of holiday destinations, with Germany probably among the winners of the trend. There is a decreasing certainty of snow falling in Germany's medium-high mountain ranges during the winter, so skiers have to head for the Alps instead – mainly to France and Switzerland. By contrast, particularly the Baltic seacoast will become more enticing to summer holidaymakers if parts of the Mediterranean region become too hot in mid-summer.[25]

The **publishing** and **motion picture industries** are struggling to deal with the ramifications of the internet. According to turnover tax statistics, newspapers, magazines and books each account for roughly one-third of publishing business. Newspapers face the stiffest competition from the internet, since the topicality of news is significant and this is an area where the internet has advantages. While publishing houses can set up their own online offerings, it is not possible to generate the same level of advertising revenue as in print business. Magazines usually contain more background reports which are not called up as often online. In the book segment, so-called e-books have become rivals of the conventional format. Electronic reading devices in pocketbook format enable entire books to be downloaded from digital sources. This means that readers can carry around the content of hundreds of books and expand their portable library online. However, it remains to be seen whether this will develop into anything more than a niche market. Germans' demand for books has risen for the past several years in a row.[26] Motion picture and video activities, like the music industry, are suffering from the illegal dissemination of content via file-sharing platforms on the internet.

[25] See Ehmer, P. and E. Heymann (2008). Climate change and tourism: Where will the journey lead? Deutsche Bank Research. Current Issues. April 11, 2008. Frankfurt am Main.
[26] See GfK (2008). Der Buchmarkt in Deutschland 2007.

Motion picture & video activities starting to reel

X-axis: Turnover - average turnover in the group, 2001-2007, % p.a.
Y-axis: Employment - average employment in the group, 2001-2007, % p.a.



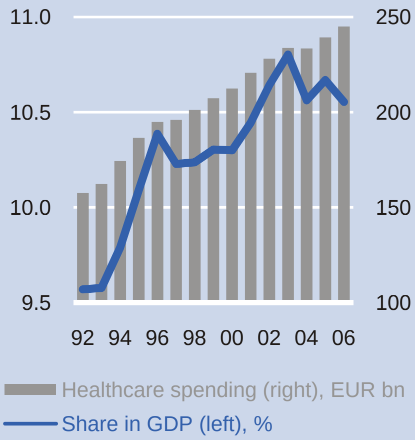
- See tips for reading chart on page 12 – Bubble size = employment share in the group in 2007
- Compared to services sector as a whole:
Turnover -0.9% p.a. Employment +/-0.0% p.a.

* Estimate of 2007 turnover

Sources: German Federal Statistical Office, DB Research

38

Healthcare expenditures rising steadily

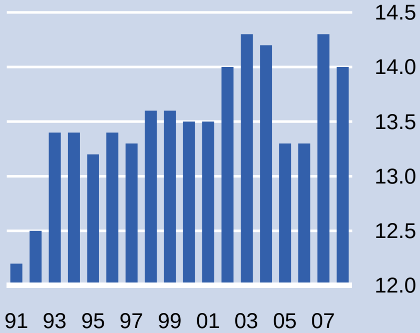


Sources: German government healthcare reports, Deutsche Bundesbank

39

Rising contribution rate

Contribution rate* for statutory health insurance in January, %



* Up to 2001 only west Germany; from July 1, 2005 employee surcharge of 0.9%

Source: KBV (National Association of Statutory Health Insurance Physicians)

40

Government services and heavily regulated services

Government services and services heavily regulated by the government were able to boost turnover significantly and increase employment at a slightly above-average rate. The cluster embraces over one-third of the workers employed in the services industry, but generates only 2% of turnover. However, the turnover tax statistics for this sector harbour substantial problems since many services are not subject to VAT. They are not negotiated on free markets, but rather in some cases provided directly by the state. No comparable figures on public administrations are available in the first place; other activities are heavily underestimated in the statistics because only small segments are captured, e.g. in education. Fluctuations appearing in these segments do not allow any conclusions to be drawn on developments in the sector as a whole.

The biggest segment in this cluster is healthcare and social work, followed by public administration and education. The key factors determining the developments in these segments are public finances and policy decisions. Significant expansion in the education sector, for instance, is not possible without the related government institutions, and thus not without the respective budgets being beefed up.

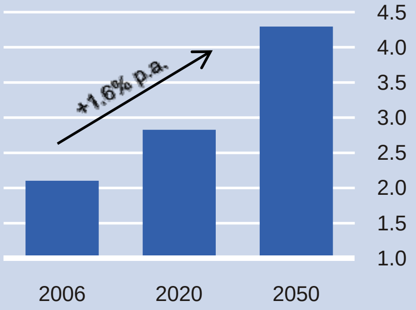
The size of the **health sector** is visible in the annual expenditures disbursed for healthcare. These total nearly EUR 250 bn, making the sector one of the biggest in Germany. Spending on healthcare exceeds 10% of GDP in Germany; only the United States, Switzerland and France exhibit higher percentages.[27] The contribution rate for the statutory health insurance system increased up until 2008, underpinning the financing of healthcare expenditures with funds from employees and employers. In the current year in particular, the contribution rate jumped because of the introduction in Germany of the Healthcare Fund.

The healing professions stand to benefit from the demographic trend, for older people have a greater need for healthcare services. Moreover, the trend towards greater health consciousness helps

[27] See Perlitz, U. (2008). Mediziner: Chancen durch neue Einnahmefelder. Deutsche Bank Research. Aktuelle Themen 408. Frankfurt am Main.

Greater need for long-term care

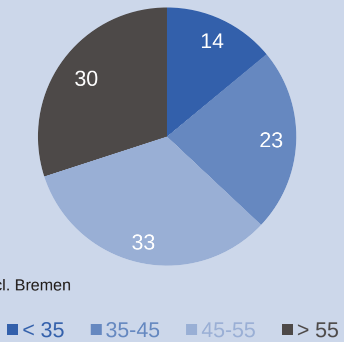
Long-term care patients in Germany, m



Source: DB Research 41

Old teachers

Age structure*, Germany in 2008, %



* Excl. Bremen

Source: German Federal Statistical Office 42

support the sector. Across all age groups there is a growing willingness to pay for healthcare – whether for services to actually restore a person to good health or to obtain related services, e.g. for better looks or to increase the overall feeling of well-being. These trends suggest that healthcare spending will continue to grow more rapidly than GDP. This holds particularly at present since the economy is ailing and non-cyclical services will stay on the winning side. In **social work activities,** long-term care is becoming more important as the population ages. According to our estimates, the number of persons requiring care up to 2020 – factoring in higher life expectancies and the probability of the need for such care remaining constant – is set to rise by approximately one-third. This corresponds to over 700,000 additional long-term care cases.[28]

The demographic challenge goes hand in hand with fears that the supply of skilled labour will run out. Workers with special skills are retiring from their professions and it is up to the **education system** to ensure adequate replacements. In the case of engineers in particular, people are afraid that Germany will lose the technological edge which makes it the world market leader in many branches of industry. Indeed, the number of students specialising in the so-called MINT subjects (mathematics, information technology, natural sciences and technology) has fallen slightly. At present, over one-third of all new students enrol at university to study one of these subjects. So in this case the reading is still well above the EU-27 average (roughly 23%). The education system itself is also being hit by a lack of skilled staff in schools. The average age of teachers at German schools is close to 50. By 2013, Germany is expected to face a shortfall of 40,000 teachers.[29]

Many jobs in healthcare and social work

X-axis: Turnover - average turnover in the group, 2001-2007, % p.a.

Y-axis: Employment - average employment in the group, 2001-2007, % p.a.

- See tips for reading chart on page 12 – Bubble size = employment share in the group in 2007
- Compared to services sector as a whole:
Turnover +4.2% p.a. Employment +0.7% p.a.

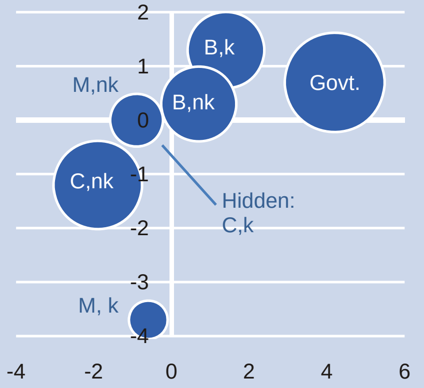
* Turnover 2002-2006

Sources: German Federal Statistical Office, DB Research 43

[28] See Gräf, B. (2009). Deutsche Pflegeversicherung vor massiven Herausforde-rungen. Deutsche Bank Research. Aktuelle Themen 442. Frankfurt am Main.

[29] See Fröhlingsdorf, M. et al. (2009). Notstand am Pult. Der Spiegel. March 2, 2009.

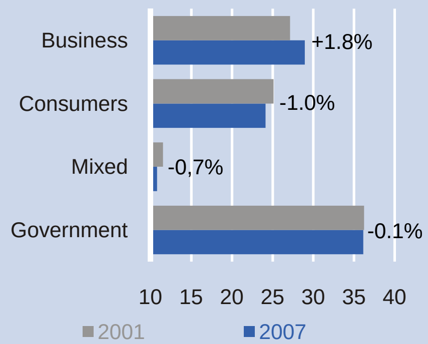
Business services outstrip consumer services
X-axis: Turnover, 2001-2007, % p.a.
Y-axis: Employment, 2001-2007, % p.a.



Average of total services sector was subtracted in each case; bubble size = share of employment in total tertiary sector
B = Business, C = Consumption, M = Mixed
k = knowledge-intensive, nk = not knowledge-intensive

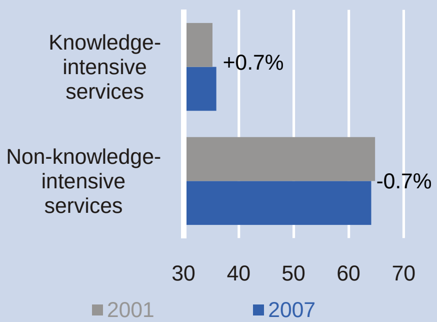
Sources: German Fed. Statistical Office, DB Research 44

Business services gaining ground
Contribution to employment in services sector in Germany, %



Sources: German Fed. Statistical Office, DB Research 45

Knowledge-intensive services starting to close gap
Contribution to employment in services sector in Germany, %



Sources: German Fed. Statistical Office, DB Research 46

6. The services world in a state of flux

Classifying services by knowledge intensity and user group enables a comparison of different types of services. This comparison shows that business services in the private sector have developed best both in terms of turnover and in terms of employment. While consumer services registered the lowest increase in turnover, more jobs were created in this group than in services for mixed user groups. Government services assume a special position in terms of turnover; because of the statistics problems already discussed, the information available is not meaningful. As the biggest employers in the tertiary sector (in a comparison of the seven types of services), government services increased their lead over most of the services fields in the realm of the private sector.

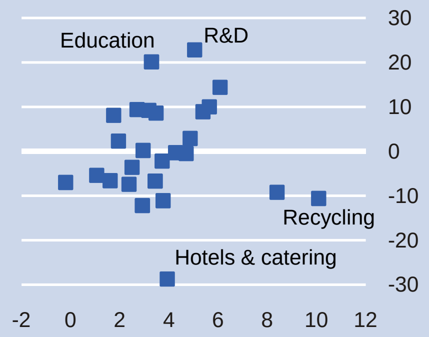
Business services are gaining significance

Business services increased their contribution to employment in the services sector by 1.8 pp, to nearly 29%. This is a good indicator of the increasing integration of the economy. The gain in significance comes mainly at the expense of other private-sector services. Taken together, business services (that is, both knowledge-intensive and non-knowledge-intensive services) remain the largest employers in the private sector with over 7.6 million workers. They developed better than consumer services especially because of globalisation and the growing trend towards project economy structures. Globalisation enabled high growth rates, particularly in internationally operating sectors, e.g. shipping, logistics and banks. Consumer services such as retailing or restaurants and bars were unable to benefit. They rely on domestic demand, which lagged behind external demand over the past few years. Furthermore, globalisation benefited business services via an indirect effect: stronger pressures to boost competitiveness and efficiency compelled companies to focus on their core activities. Ancillary tasks were outsourced to specialised service providers. This increased the growth potential for many business services providers, benefiting sectors such as IT. Consumer services such as retailing or tourism, by contrast, have been offered by traditional services enterprises since time immemorial.

A comparison of service types by knowledge intensity produces an unclear picture. Services with relatively clearly defined user groups show the knowledge-intensive segments in the lead. But in the case of services for mixed user groups, it was unsophisticated services that created significantly more jobs. All in all, knowledge-intensive services increased their weight (in terms of worker numbers) by 0.7 pp. The group of non-knowledge-intensive services remains larger by a wide margin, though, with a share of about 64%. Measured in terms of value added, the two types of services posted nearly identical performance. It is virtually impossible to prove a correlation between knowledge intensity and value added on the basis of the statistics. But this is largely due to individual sectors which distort the picture (e.g. hotels & catering and recycling – see chart). If these are removed from the sample, there is a correlation between the two parameters. The employment trend established here does lend underpinning to the assertion that Germans are increasingly fostering knowledge-intensive sectors. Nonetheless, this cluster has shown only minimally faster growth of late.

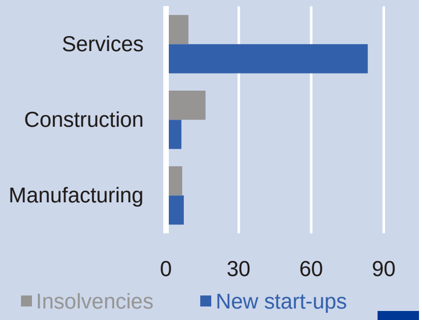
Naturally, the statistics do not show the complete picture: business services flow into the value added of other companies as factor

Knowledge intensity doesn't mean greater value added
X: Value added, 1991-2006, % yoy
Y: Knowledge intensity, scoring points



Sources: German Fed. Statistical Office, DB Research 47

Services sector expanding
Share of new start-ups / insolvencies per 1,000 companies, Germany in 2008



Source: Creditreform 48

inputs or support services. This means they can influence the efficiency and growth of other sectors. Knowledge-intensive services in particular – take data processing as an example – have the potential to boost economic growth indirectly: the reason is that they can increase productivity in other segments and enhance their growth accordingly. These indirect effects are not reflected here, though. In this respect, the turnover ratio between knowledge-intensive and non-knowledge-intensive services of roughly 29% to 71% is not equal to their actual value-added shares in the economy. Equally, the boundaries between manufactured product and service product are blurring. This creates problems with the statistical recording of services and reduces the meaningfulness of the statistics. All in all, not too much should be read into the values calculated. However, they do indeed show trends and point to the direction in which the services landscape in Germany is developing.

Gain in industry's significance not likely to last …

During the last upswing, industrial sectors benefited more than others. Now, in the recession, they will be hit harder than others. This means that the share of services will automatically start to increase again. A leading indicator of this pattern is the number of new start-ups, and the tertiary sector contributed over 80% of the total in 2008. The insolvency ratio, by contrast, was not significantly higher than in the manufacturing sector and was much lower than in the construction sector. This suggests that the services field is expanding. Many companies are able to focus more closely on their core activities and entrust other jobs to external service providers. Logistics shows that ever earlier stages of the value-added process and ever more complex services are being outsourced. While initially the main focus was on pure transport services from A to B, logistics providers today manage whole company divisions. The depth of outsourcing has steadily increased.

… but don't expect a pure-play services society

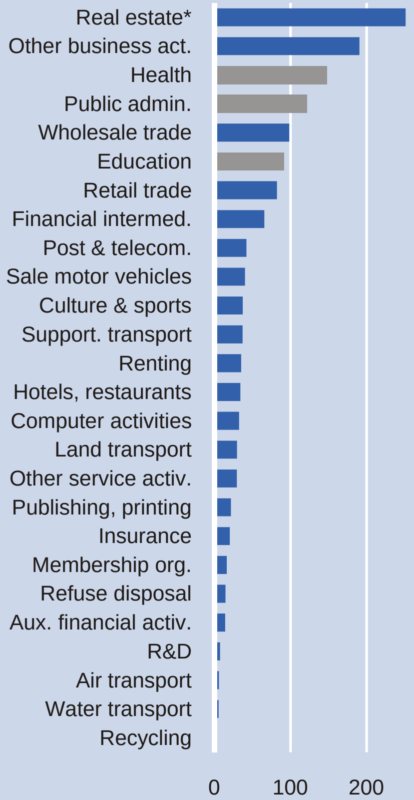
The increase in the tertiary sector's share of value added is set to slow, however. At the same time, Germany will very probably see a much smaller degree of expansion than some other developed countries. Economic expansion follows certain growth paths, and Germany has a comparatively broad industrial base. For this reason, the services sector is likely to remain less significant there than in some other economies.

The simple calculation of the three sectors' contributions to GDP is only one slice of reality in any attempt to capture the actual value-added structure of an economy. This is partly attributable to the fact that services from an industrial company are falsely but automatically attributed to goods production. Similarly, the distribution of value added across the three sectors of the economy provides a comparably poor explanation of the competitiveness or the wealth of a developed country. This suggests that there is no compelling reason for services to account for the largest share possible.

Knowledge-intensive business services on an uptrend

The economic integration between both businesses and entire economies on the one hand and the capital market and trade on the other will continue to intensify on a long-term horizon. The repercussions of the financial crisis will result in an only temporary setback. The process of globalisation is unlikely to end. This

Government services generate substantial value added
Gross value added in Germany in 2006, EUR bn



* Excessive reading owing to statistical effect: (notional) rents for owner-occupied homes are included

Source: German Federal Statistical Office 49

suggests that the services sectors that will grow in future will be those in particular whose product can be traded internationally. Germany will increasingly position itself as a provider of knowledge-intensive services. Consequently, knowledge-intensive business services are likely to be on the winning side going forward. By contrast, the growth potential for domestic demand is shaped particularly by the demographic change. For this reason, most of the consumer services demanded in the national market are likely to develop even more poorly than in the past few years. The current modest pattern of private consumption looks set to become the norm going forward. In a few years' time, stagnation may in fact prove to be good news in this area. Nonetheless, the data show the major significance of relatively simple services as a means of employment: providers of such services employ nearly two-thirds of all workers in the private sector.

The services environment in Germany is in a constant state of flux. On the one hand there are the traditional service providers such as hairdressers. On the other, innovation activities are creating and fostering entirely new sectors such as information technology. Look for more of the same in future.

Philipp Ehmer (+49 69 910-31879, philipp.ehmer@db.com)

Services sectors in Germany

Sector	NACE	User group	Knowledge intensive	Turnover 2007	Turnover 2001-2007	Workers 2007	Workers 2001-2007
		Consumers/ Business/ Mixed	yes/no	EUR bn	% p.a.	'000	% p.a.
Publishing	22.1	M	no	37.8	-1.0	320	3.0
Printing	22.2	B	no	23.6	-1.2	234	-2.2
Reproduction of recorded media	22.3	C	no	1.0	-0.7	4*	0.0*
Recycling of metal waste & scrap	37.1	B	no	5.6	10.4	20	7.4
Recycling of non-metal waste & scrap	37.2	M	no	5.0	8.4	26	1.3
Sale of motor vehicles	50.1	M	no	131.2	1.8	227	-0.5
Maintenance & repair of motor vehicles	50.2	M	no	17.8	2.1	436	1.6
Sale of motor vehicle parts & accessories	50.3	M	no	32.2	4.7	135	5.7
Sale, maintenance etc. of motorcycles	50.4	C	no	4.1	6.6	26	-5.7
Retail sale of automotive fuel	50.5	M	no	16.0	2.3	81	1.3
Wholesale on a fee or contract basis	51.1	B	no	38.7	7.2	280	-2.0
Wholesale agricultural raw materials & animals	51.2	B	no	44.2	2.2	40	2.7
Wholesale of food, beverages & tobacco	51.3	B	no	181.7	2.5	165	-0.5
Wholesale of household goods	51.4	B	no	189.3	2.1	197	3.5
Wholesale non-agricultural intermed. products	51.5	B	no	352.4	6.6	143	-2.9
Wholesale machinery, equipment & supplies	51.8	B	yes	118.9	4.3	142	4.0
Other wholesale	51.9	B	no	24.5	-1.0	172	-1.1
Retail sale in non-specialised stores	52.1	C	no	198.5	1.6	1,011	12.6
Retail sale of food, beverages etc.	52.2	C	no	18.8	-0.7	385	-11.7
Retail sale of pharmaceutical goods etc.	52.3	C	yes	55.6	3.1	331	1.9
Other retail sale in specialised stores	52.4	C	no	153.7	-0.5	1,269	-2.1
Retail sale of second-hand goods	52.5	C	no	2.4	6.6	16	-1.9
Retail sale not in stores	52.6	C	no	29.5	4.5	194	6.4
Repair of personal and household goods	52.7	C	no	2.2	-0.8	58	-1.1
Hotels	55.1	M	no	16.9	1.6	339	1.1
Other provision of short-stay accommodation	55.2	C	no	2.0	4.5	35	6.5
Restaurants	55.3	C	no	26.4	1.0	797	1.5
Bars	55.4	C	no	7.6	-1.3	134	10.7
Canteens & catering	55.5	B	no	5.1	5.1	123	5.9
Transport via railways	60.1	M	yes	21.1*	8.6*	174	-3.0
Other land transport	60.2	B	no	45.8*	0.8*	424	1.1
Transport via pipelines	60.3	B	no	0.7*	4.9*	2*	0.0*
Sea & coastal water transport	61.1	B	yes	11.7	17.3	26	4.5
Inland water transport	61.2	B	yes	2.4	5.7	14	-1.1

Sector	NACE	User group	Knowledge intensive	Turnover 2007	Turnover 2001-2007	Workers 2007	Workers 2001-2007
		Consumers/ Business/ Mixed	yes/no	EUR bn	% p.a.	'000	% p.a.
Scheduled air transport	62.1	M	yes	11.7	6.0	74	-0.7
Non-scheduled air transport	62.2	C	no	2.0	3.4	10	16.5*
Space transport	62.3	B	yes	0.04	-3.3	4*	-3.7*
Cargo handling & storage	63.1	B	no	5.9	0.2**	44	6.0
Other supporting transport activities	63.2	B	no	8.8	-2.6	96	3.1
Travel agencies & tour operators	63.3	C	yes	14.0	-2.2	137	1.7
Activities of other transport agencies	63.4	B	no	66.5	6.1	598	3.8
Post & courier activities	64.1	B	no	29.8	4.0	360	0.6
Telecommunications	64.3	M	yes	59.8	1.0	187	-5.8
Monetary intermediation	65.1	B	yes	23.2	5.0	726	-2.1
Other financial intermediation	65.2	B	yes	14.5	8.1	38	4.6
Insurance and pension funding	66.0	M	yes	3.1	1.8	291	-2.8
Activities aux. to financial intermediation	67.1	B	yes	4.7	18.4	77	13.5
Activities aux. to insurance & pension funding	67.2	C	yes	1.3	1.8	171	7.8
Real estate activities with own property	70.1	M	yes	23.5	3.6	25	-16.5
Letting of own property	70.2	M	no	95.4	4.6	53	4.4
Real estate activities on a fee or contract basis	70.3	M	yes	27.7	0.7	237	7.7
Renting of automobiles	71.1	M	no	16.6	-1.6	14	-1.1
Renting of other transport equipment	71.2	B	no	4.8	9.4	8	0.0
Renting of machinery & equipment	71.3	B	no	15.3*	0.3*	12	4.9
Renting of personal & household goods n.e.c.	71.4	M	no	3.5*	5.8*	20	1.8
Hardware consultancy	72.1	B	yes	3.7	5.7	104	43.3
Software consultancy & supply	72.2	B	yes	27.5	3.4	278	0.5
Data processing	72.3	B	yes	16.0	0.4	85	-4.1
Database activities	72.4	B	yes	0.5	1.8	32	41.4
Repair of office machinery etc.	72.5	B	yes	0.6	-7.0	32	19.5
Other computer-related activities	72.6	B	yes	6.7	5.1	47	10.4
R&D on natural sciences, engineering etc.	73.1	B	yes	6.2	3.5	157	7.3
R&D on social sciences etc.	73.2	B	yes	0.3	0.7	25	2.9
Legal, management consultancy etc.	74.1	B	yes	181.8	5.7	832	3.3
Architectural & engineering activities	74.2	B	yes	40.6	1.2	366	2.0
Technical testing & analysis	74.3	B	yes	7.5	2.7	84	2.6
Advertising	74.4	B	yes	27.2	0.8	176	0.7
Labour recruitment & provision of personnel	74.5	B	no	16.4	11.7	205	13.3

Sector	NACE	User group	Knowledge intensive	Turnover 2007	Turnover 2001-2007	Workers 2007	Workers 2001-2007
		Consumers/ Business/ Mixed	yes/no	EUR bn	% p.a.	'000	% p.a.
Investigation & security activities	74.6	B	no	4.5	2.8	116	4.1
Industrial cleaning	74.7	B	no	12.3	1.5	499	4.1
Miscellaneous business activities n.e.c.	74.8	B	yes	74.4	5.0	503	8.9
Public administration	75.1	Govt.		-	-	1,614	-1.2
Provision of community services	75.2	Govt.		-	-	972	-0.8
Compulsory social-security activities	75.3	Govt.		-	-	330	1.0
Primary education	80.1	Govt.		0.02	26.5	837	2.9
Secondary education	80.2	Govt.		0.5	-4.0	682	-1.0
Higher education	80.3	Govt.		0.7	1.9***	393	3.3
Adult & other education	80.4	Govt.		6.1	4.9	325	4.9
Human health activities	85.1	Govt.		40.2	7.2	2,648	1.3
Veterinary activities	85.2	C	yes	2.3	4.9	42	2.6
Social work activities	85.3	Govt.		17.4	9.9	1,709	4.6
Sewage & refuse disposal etc.	90.0	M	no	20.2	5.8	161	0.4
Business, employers' organisations etc.	91.1	B	yes	1.3	2.2	70	-0.5
Activities of trade unions	91.2	C	yes	0.1	15.8	15	-1.1
Activities of other membership organisations	91.3	C	yes	5.9	7.5	335	-0.3
Motion picture & video activities	92.1	M	no	6.2	-7.6	38	0.9
Radio & television activities	92.2	C	yes	9.0	2.2	65	-6.0
Other entertainment activities	92.3	C	no	7.1	3.5	208	3.2
News agency activities	92.4	B	yes	2.1	3.7	60	3.8
Library, archives, museums etc.	92.5	C	yes	0.8	8.6	70	4.7
Sporting activities	92.6	C	no	7.3	5.9	140	5.8
Other recreational activities	92.7	C	no	15.3	1.7	84	-2.7
Other service activities	93.0	C	no	42.4	4.8	810	-0.6

* Estimates
** 2002-2007 p.a.
*** 2002-2006 p.a.

Sources: German Federal Statistical Office, DB Research

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