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Innovation in Germany

Results of the German Innovation Survey 2007

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Innovation Gathering Momentum

Conditions for innovation activities improved noticeably in 2006. Demand increased from Germany and abroad. Output grew in almost all industries. With production approaching capacity, investment in facilities and equipment rose. At the same time, more revenue came in from sales. This positive development had not been predicted by most enterprises at the start of 2006. Such a change in the business environment affected innovative activity in the economy in a number of ways:

- Germany's enterprises increased their innovation expenditure considerably in 2006. They spent a total of €115.5bn, up by a good 6% on the previous year (sectors covered: mining, manufacturing, energy and water, knowledge-intensive services, selected other services). This rise was accompanied by comparable revenue growth of 7% in nominal terms. Going by enterprises' plans in spring 2007, the expansion in innovation spending was set to continue through 2007, leading to a rise of 5.5% for the year. The trend seems set to cool off by 2008, however, with the predicted rise down to slightly less than 2%.
- The innovation rate, i.e. the share of all firms that successfully implement product or process innovations, remained largely unchanged at just under 46% in 2006. The rate increased among businesses in the "other services" sector grouping, but the effect of this rise on the overall figure was counteracted by a decrease among knowledge-intensive service firms. The innovation rate in manufacturing remained constant. This trend is likely to continue in 2007 and 2008. Providers of knowledge-intensive services in particular have shown considerable reticence in their innovation plans for these two years.
- The share of turnover from the sale of new products rose slightly, with the average for all sectors increasing to 19% from its previous value of 18%. Enterprises in the service sectors were the most successful in this respect. In contrast, the share of turnover from the sale of market novelties remained constant. Savings from process innovations designed to rationalise production also proved stable, averaged over all sectors.

Innovation Rate Unchanged

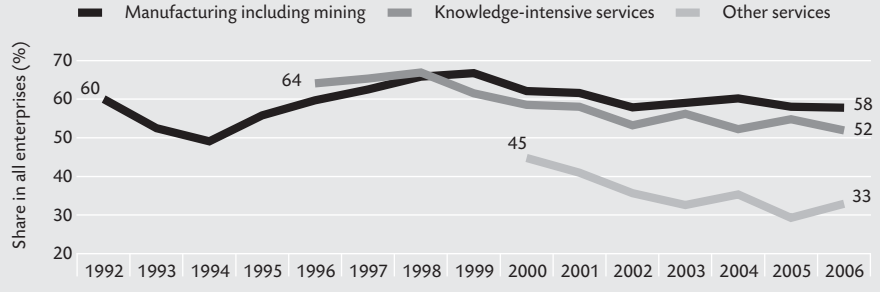
The improved business climate has not been accompanied by an upturn in the share of German enterprises implementing product or process innovations. In the industries included in the survey (see box "Sector Groupings"), the 2006 innovation rate was approximately 46%. The rate for manufacturing was an unchanged 58%. The figure for knowledge-intensive services fell to 52%, having risen to 55% in the previous year. These enterprises' involvement in innovation has been quite unstable in recent years, suggesting that their innovation activities are focussed on the short term. It is also important to bear in mind that, although the 2006 innovation rate was low, there were a number of firms with ongoing but not yet completed innovation activities.

In the other services grouping, the number of enterprises that successfully innovated recovered somewhat in 2006, after reaching an all-time low in 2005. However, this sector grouping's innovation rate of 33% is still far below the figures for manufacturing or knowledge-intensive services. This seems to imply that a large number of other service firms are able to maintain their status in the market without conducting (continuous) innovation activities.

2007/08: Cautious Times

The innovation rate is largely determined by the behaviour of small enterprises. The scale of the economic upturn in 2006 came as something of a surprise to many of these businesses and they failed to make the best use of the improved economic climate to introduce new products and services. The sustained growth of 2007 may

Innovation Rate 1992 to 2006

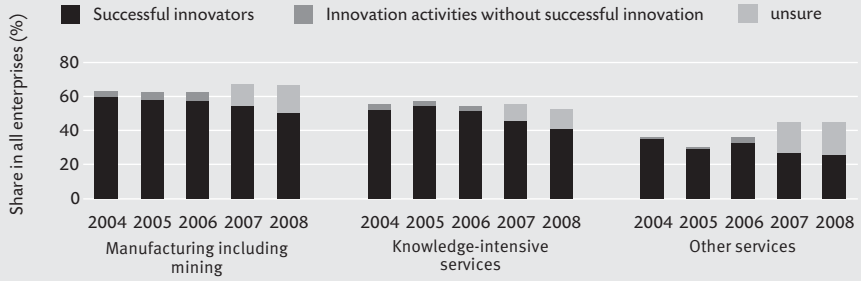


Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Innovation rate: Innovators as a percentage of all firms with more than 5 employees; 2005 and 2006 values are provisional; service sector data only available from 1996. Values for other services before 2000 are not comparable with the following years and therefore not cited. All values are projected for the total firm population in Germany.

Sector groupings

The ZEW's innovation survey covers the following sector groupings:
Manufacturing including mining – includes categories NACE (rev. 1.2) 10 to 37 in the classification of economic activity.
Knowledge-intensive services: Banking and insurance, data processing and telecommunications, techincal services (R&D related services, engineering offices, technical laboratories etc.) consultancy and advertising (NACE 64.3, 65-67, 72-73, 74.1-74.4).
Other services: Wholesale trade, transportation, postal services, cleaning, security, provision of staff, office services, waste disposal (NACE 51, 60-63, 64.1, 74.5-74.8, 90). Also covered are the industry categories of energy and water supply (NACE 40-41) and – since 2003 – motion picture and broadcasting (NACE 92.1-92.2). Indicators relating to these sectors are published separately in a ZEW "Branchenbericht" for each industry (German language only) and are not included in the three sector groupings used here.

Innovation activities 2004 and 2008



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Enterprises that carried out innovation activities in the relevant year as a percentage of all enterprises with more than 5 employees. Values for 2005 and 2006 are provisional. Data for 2007 and 2008 are based on enterprise expectations in spring 2007. All values are projected for the total firm population in Germany.

substantially increase enterprises' willingness to invest in innovation.

That being said, little evidence can be found to this effect in enterprises' plans for 2007 and 2008, as they stood in the spring of 2007. The share of enterprises that definitely planned to carry out innovation activities in these two years is lower than the 2006 figure in all three sector groupings. In 2006, 63% of manufacturing enterprises were innovation active (58% innovation projects that were successfully concluded and 5% still in progress or abandoned). Yet only 54% had definite plans for innovation activities in 2007 and only 51% for 2008. It should be noted, however, that 13% were still unsure whether they would carry out innovation activities in 2007, and 16% were not sure about 2008. Bearing all of these factors in mind, we can expect manufacturing firms' involvement in innovation to remain steady or decrease slightly in 2007 and 2008.

The proportion of knowledge-intensive service firms that are innovation active can be expected to fall considerably in 2007 and 2008. A share of 55% were engaged in innovation activities in 2006 (3% had not yet successfully completed a project). For 2007, the figure for planned innovation projects falls to 46%, although a further 10% are still undecided. The proportion of firms definitely planning to innovate in 2008 is lower again, at 41%, with a slightly higher share of 11% still unsure.

Enterprises in other services are more optimistic overall. The share of innovation active enterprises is likely to rise compared to the 33% achieved in 2006. Although the proportion of businesses that have definite innovation plans is slightly lower, at 27% for 2007 and 28% for 2008, relatively large numbers are still undecided (18% and 19% respectively).

Increased Focus on Product Innovations

Innovation activities can be intended to introduce either products that are new to the company or new processes for production, service provision or distribution. Many of the innovators – 47% in manufacturing, around 40% in services – implemented both product and process innovations within a three-year time-frame. Between a sixth and a quarter of innovators only implemented process innovations; between 37% and 40% were purely product innovators.

As a share of all firms, the proportion of product innovators in 2006 was 49% in manufacturing, 40% in knowledge-intensive services and 26% in other services. The proportion of process innovators is somewhat lower in all sector groupings: 36% in manufacturing, 32% in knowledge-intensive services and 20% in other services. Among manufacturing firms, the overall innovation rate was the same as in 2005, but there was a slight shift in favour of product innovation. The decline in the innovation rate in knowledge-intensive services is primarily due to a lower share of process innovators. In particular, there was a clear drop in the number of enterprises implementing process innovations only. The rise in the innovation rate for other services is the result of a noticeably higher share of product innovators. At the same time, the share of purely process innovators decreased.

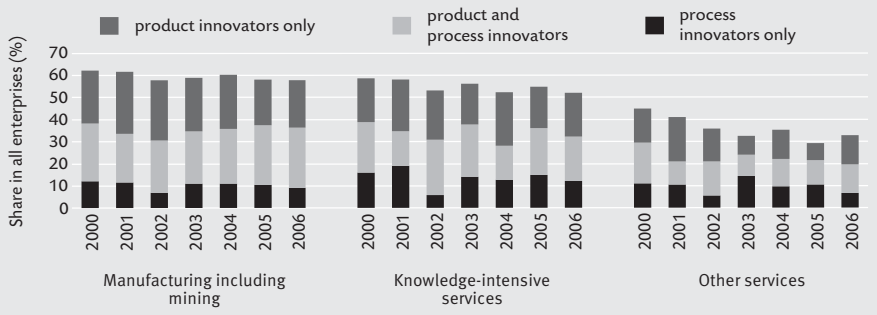
The share of process innovators fluctuates more over the years than that of product innovators. This indicates that process innovations have a short-term focus. Such innovations often involve investing in new plant equipment or IT solutions and are often implemented over a short period of time.

Innovation Spending Picks Up

Innovation expenditure in Germany's economy (in the sectors surveyed here, including energy/water and the media) stood at €115.5bn in 2006, a nominal rise of 6.3% on 2005. This continues the upwards trend that has been noticeable for a number of years. Compared to the spending increases in previous years, the 2006 rise was particularly impressive. It was also larger than businesses had predicted in the spring of 2006 (see previous year's report). The fact that actual expenditure exceeded the planned amount indicates that enterprises made quick decisions to reallocate resources to innovation activities. This applies first and foremost to enterprises that conduct innovation activities on a continuous basis and to larger firms in particular.

The majority of innovation expenditure – €82.8bn or 72% – can be attributed to manufacturing (including mining). Innovation budgets in this sector grouping were 5% up on the previous year. Knowledge-intensive service enterprises increased their innovation expenditure at the same rate. They spent €22.1bn on innovation projects in 2006, which amounts to 19% of Germany's innovation expenditure. In the other

Product and process innovators, 2000 to 2006



Source: ZEW (2007): Mannheim Innovation Panel
Notes: Values for 2005 and 2006 are provisional. All values are projected for the total firm population in Germany.

services sector grouping, expenditure on innovation rose by 11% to €8.0bn or 7% of the country's total. The energy and water sectors and the media were responsible for 2% of Germany's innovation expenditure (€2.6bn).

The enterprises' plans for 2007 point to a further, albeit less pronounced, increase in innovation expenditure. Going by the responses given in spring 2007, spending on innovation is set to increase by 5.5% to a total of just under €122bn. Above-average increases are expected in knowledge-intensive services (+7%) and the energy sector (+8%). Innovation budgets are set to be cut (-3.6%) in other services, following the sharp increase in 2006. The rise of 6% in manufacturing is consistent with the overall average for the German economy.

According to the respondents' plans for 2008, innovation budgets can be expected to grow slightly to just under €124bn (+1.6%). While increased innovation spending is on the cards for manufacturing (+3%) and energy (+9%) in 2008, service firms plan to cut their expenditure (knowledge-intensive: -2.5%, other: -5%). However, experience in previous years has shown that such projected figures are highly uncertain and often fail to predict actual developments. This is particularly true when key economic parameters, such as economic growth or competition in international markets, change unexpectedly after enterprises have made their plans.

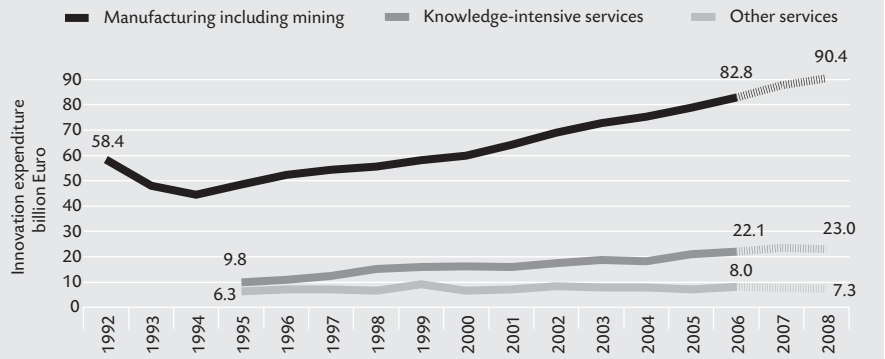
Innovators / Innovations

Innovators are firms that successfully introduced at least one innovation in the previous three-year period (i.e. in the case of 2006, a firm introduced at least one innovation between 2004 and 2006). Whether or not another firm has already implemented the same innovation is not considered; the assessment of the innovation from the perspective of the firm in question is the essential point.

Product innovations are new or significantly improved products and/or services with respect to technological characteristics or intended uses, which are brought onto the market by a firm. **Process innovations** are new or significantly improved production, delivery or distribution methods, including methods to provide services, introduced by a firm.

Innovative firms are firms that engage in any kind of innovation activities in the observed year, i.e. that allocate funds to innovation projects, regardless of whether the projects are completed successfully. The definitions correspond to those of Eurostat and the OECD, which are established in the Oslo Manual.

Innovation expenditure, 1992 to 2008



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. Werte. Values for service sectors are only available from 1995 onwards. Data for 2007 and 2008 are based on respondents' plans and expectations as of spring 2007. Values for other services from 2000 on are only partially comparable with those from previous years. All values are projected for the total firm population in Germany.

Innovation Intensity Unchanged

In spite of the substantial rise in innovation expenditure in 2006, there was hardly any change in innovation intensity (the ratio of innovation expenditure to turnover). In manufacturing and banking/insurance, innovation budgets expanded at the same rate as turnover. The remaining knowledge-intensive service firms and those in the other services grouping increased their innovation spending above the rate of turnover growth, leading to a slight rise in their innovation intensity. Innovation intensity in manufacturing peaked in 2003; in 2006 it stood at 4.9% for the third year running. This contrasts with the upward trend in knowledge-intensive services (excluding banking and insurance), which began in the mid-1990s. Innovation activities in these industries continue to occupy an increased proportion of turnover, with innovation intensity reaching a record high of 5.6% in 2006.

The innovation expenditure increases planned for 2007 are lower than the predicted turnover growth, meaning that a slight drop in innovation intensity is to be expected. This downward trend could continue in 2008. In knowledge-intensive services, on the other hand, the rise in innovation intensity is expected to continue in 2007. A slowdown may come in 2008, if enterprises in this grouping only implement the small increases they have planned for their innovation budgets. A slight reduction in innovation intensity is expected in banking/insurance and other services by 2008.

Projected values for 2007 and 2008

Data on innovation activities and expenditure are based on enterprises' plans and expectations. These are strongly influenced by what information about probable economic developments in the second half of 2007 and in 2008 was available at the time of the survey. When the survey was carried out in March to July 2007, the outlook for 2007 was thoroughly optimistic. The upturn in the economy was expected to continue in 2008, albeit at a reduced rate. The economic research institutes predicted growth for 2007 and 2008 of 2.4% in reports published in spring 2007.

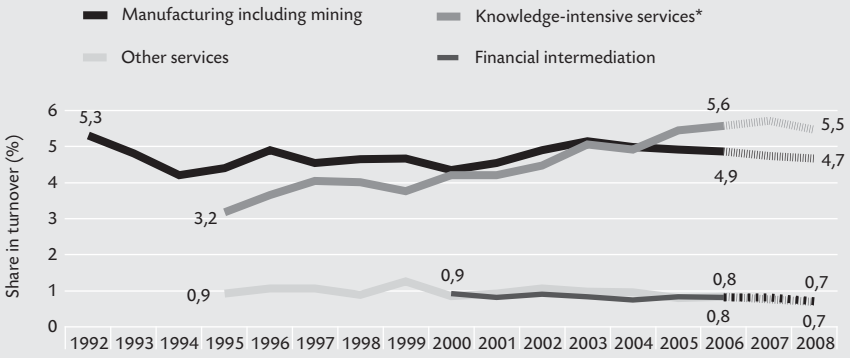
Investment Makes Up a Third of Innovation Expenditure

Thirty-five percent of the German economy's innovation expenditure in 2006 took the form of investment in tangible or intangible assets. This is a long way below the values of up to 45% recorded in the late 1990s. After rising to 38% in 2004, investment expenses as a share of overall innovation expenditure fell back to match the record low recorded in 2003. This means that the current sharp increases in innovation spending are mostly in the areas of personnel, equipment and producer goods (including contracting out work to third parties). Nevertheless, the nominal value of investment in the context of innovation projects increased again in 2006, rising by 4.5% to exceed €40bn (including energy/water and the media) for the first time. For the sectors included in the survey, this corresponds to almost a quarter of total gross investment in buildings, plant and other equipment.

Innovation Expenditure

Innovation expenditure refers to spending on ongoing, completed and discontinued innovation projects in a one-year period, encompassing both **current** (personnel and material, etc.) and **investment expenses**. R&D expenditure and innovation-related spending on machinery, equipment and material, external knowledge (e.g. software, patents, licenses), advanced employee training, market launch, product design, conception of service and other preparations for production and distribution of innovations are counted among these expenses.

Innovation intensity, 1992 to 2008



Source: ZEW (2007): Mannheim Innovation Panel.
*excluding financial intermediation
Total innovation expenditure as a percentage of total turnover for all enterprises with 5 or more employees. Values for 2005 and 2006 are provisional. Values for 2007 and 2008 are estimated on the basis of enterprises' plans and predicted development of turnover in the three sector groupings. Values for financial intermediation before 2000 are not comparable. All values are projected for the total firm population in Germany.

The share of expenditure used for investment fell in all three sector groupings. Only in energy/water (not shown in diagram) did investment increase faster than overall expenditure. Manufacturers allocated only 30% of their innovation budgets to investments in 2006. These innovation investments make up a good 40% of all fixed asset investments. The aim of rationalisation remains an important reason to invest. Investment expenses as a share of innovation expenditure fell to 37% in knowledge-intensive services but remained constant at 68% in other services. Such investments amounted to around €14bn, or 14% of Germany's gross investments in 2006 in the service sectors. As such, only a small part of the investment activity conducted in the service sectors is related to innovation projects.

Market Novelties Up Again

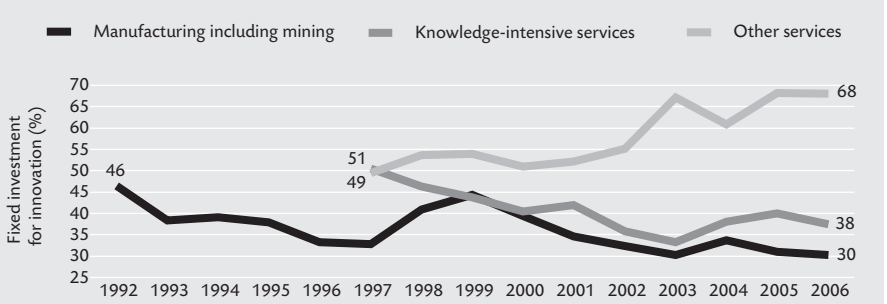
The product innovation rate, i.e. the proportion of enterprises that have successfully introduced new products to the market, remained essentially unchanged from the previous year in manufacturing (49%) and knowledge-intensive services (40%). In other services, however, there was a sharp increase, from 19% to 26%. Among product innovators, there was a slight increase in the proportion introducing market novelties, for the first time in several years. This type of product innovation involves bringing a new product to the market, i.e. a product which no competitor has previously offered in the same or a similar form. The share of enterprises with such market novelties as a proportion of all product innovators rose to 47% in manufacturing and to 31% in other services. Knowledge-intensive services saw a slight decrease, from 34% to 33%.

Product innovation is not only driven by the introduction of fundamentally new products or services. Impulses for innovation activity can also come from firms wishing to diversify the goods they supply. The term "product range novelties" applies to products that are different from anything an enterprise has sold before. In practice, product range novelties are often also market novelties. In 2006, 58% of all product innovators in manufacturing reported having introduced product range novelties. The corresponding share of innovative knowledge-intensive service firms was 48% and that of other service firms 34%. This proportion was considerably down on the previous year in all three sector groupings.

Nevertheless, product innovation strategies are more likely to focus on diversification than on original innovation (which often implies a strategy of technology leadership). While manufacturing enterprises often pursue both strategies concomitantly – this is the case for 36% of product innovators in the grouping – the share among service enterprises is considerably lower, at 25% (for knowledge-intensive services) and 16% (for other services).

A third group of product innovators can be described as "imitators", in that they introduce new products to their existing range, which are already available from competitors in the same or a similar form. Imitators account for 31% of all product innovators in manufacturing, 43% in knowledge-intensive services and 51% in other services. These percentages have risen in all three sector groupings, meaning that the focus of product innovation has shifted somewhat towards a strategy of imitation.

Fixed investment as a share of total innovation expenditure, 1992 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. Values for other services from 2000 on are only partially comparable with those from previous years. No values were recorded in service sectors before 2007. All values are projected for the total firm population in Germany.

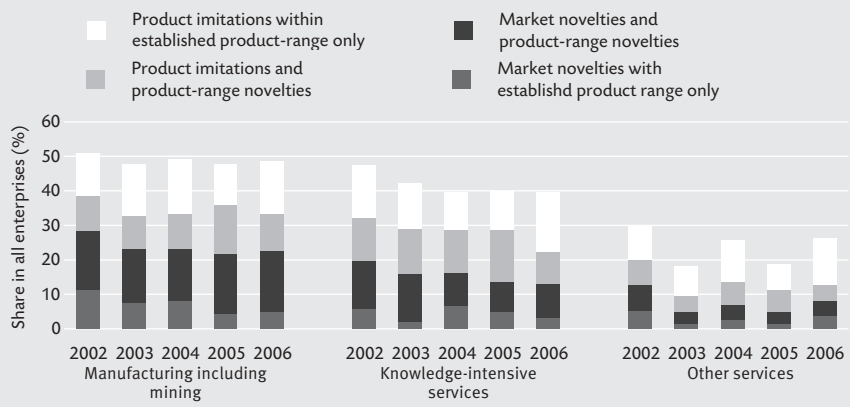
Improving Quality More Important Than Cutting Costs

The process innovation rate, i.e. the share of enterprises that introduced new processes for production, service provision or distribution, fell in all three major sector groupings in 2006. The decline was only small in manufacturing (down to 36%

Market novelties, product imitations, product-range novelties

Market novelties ("new-to-the-market products") are new or significantly improved products and/or services that a firm has introduced onto the market prior to any competitor. **Product imitations** are new or significantly improved products and/or services introduced by a firm onto its market which were already offered by competitors at the time of introduction. The relevant market is defined from the firm's own perspective.
Product-range novelties are new or significantly improved products and/or services that have no predecessors in the innovating firms. Such innovations thus enlarge the product range of a firm and allow it to address customer demand not covered by a firm's products and services so far. Information on product-range novelties has been registered in the innovation survey since 2002.

Product innovators with market novelties and product range novelties, 2002 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
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from 37% in 2005), but greater in knowledge-intensive services (32% compared to 36% in 2005). The process innovation rate in other services fell 2 percentage points to 20% in 2006.

Generally speaking, there are two types of impulse that motivate process innovations. Firstly, new processes can help cut costs, i.e. they enable more efficient production of physical goods and services. In 2006, 59% of process innovators in manufacturing succeeded in cutting costs through innovation. This compares to only 36% in knowledge-intensive services and 53% in other services. Comparing this to the previous year reveals a decline in the importance of rationalisation as a motive for innovation in manufacturing and knowledge-intensive services in 2006. In contrast, its importance was slightly up in the other services grouping.

A second possible aim of process innovations is to improve the quality of products and services. The proportion of process innovators that successfully implemented quality improvements is higher than the share that carried out rationalisation innovations. Enterprises that brought in quality improvements account for 71 % of all process innovators in manufacturing, 72 % in knowledge-intensive services and 54 % in other services. Compared to previous years, however, quality-improving process innovations declined somewhat in all three sector groupings.

The share of process innovators that neither successfully cut costs nor improved the quality of their goods is comparatively low, but has recently risen. Enterprises in this group may have changed their processes in a way that has yet to yield the desired results. Alternatively, the process innovations implemented may have gone hand-in-hand with the launch of new products, in which case it would not be possible to lower costs or improve quality.

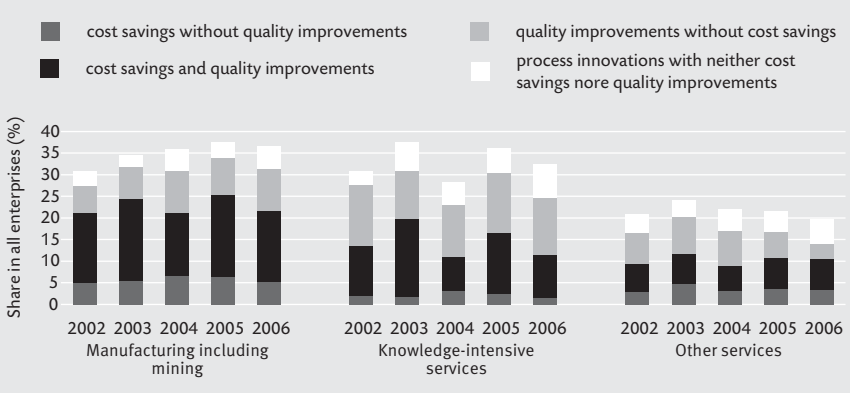
Two of the indicators that provide information about the focus of product and process innovations have been recorded regularly over several years, enabling a longer-term comparison. The first is the share of firms that bring new products to the market. This has tended to decline over the past seven years. For the last three years, the value has only fluctuated slightly in all three sector groupings. More and more enterprises are apparently finding it difficult to bring completely new products to the market. The higher proportion of new products at the end of the 1990s was connected to the rapid developments in information and communication technologies at the time, which provided impetus for product innovation in a number of ways.

The second of the indicators is the proportion of enterprises that have implemented cost-saving process innovations. Although the values of this indicator have fluctuated considerably from year to year since 2000, there has been no substantial change overall. The value fell from 2005 to 2006, having increased sharply from 2004 to 2005. Changes to the survey questionnaire mean that the high figures recorded at the end of the 1990s cannot be directly compared with those from 2000 onwards.

Small Rise in New Products' Contribution to Turnover

The direct economic success of product innovations can be measured using the share of turnover brought in by newly-launched products. One should bear in mind that some time can pass between the introduction of an innovation and the appearance of clear innovative success. To account for this, products introduced in the

Cost savings and quality improvements thanks to process innovations, 2002 to 2006



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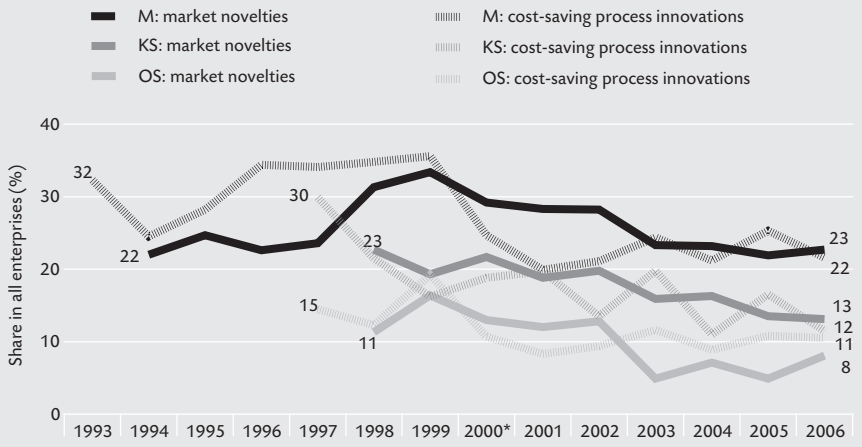
Market novelties and cost-saving process innovations, 1993 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
M: Manufacturing (incl. mining), KS: Knowledge-intensive services, OS: other services
Notes: Values for 2005 and 2006 are provisional. *Values for enterprises with cost-saving process innovations from 2000 on are only partially comparable with previous years. Market novelties were first included in 1994 for manufacturing and 1998 for services. All values are projected for the total firm population in Germany.

last three years are considered to be "new" when calculating this indicator. The share of turnover due to new products only increased slightly in 2006 in manufacturing and knowledge-intensive services. It equalled 28% in manufacturing and 14% in knowledge-intensive services. A more substantial increase was apparent in other services. The share of turnover these enterprises attributed to new products was up by around 1.5 percentage points. The resulting 7.5% of turnover marks a return to 2003 and 2004 levels.

The share of turnover due to new products is strongly influenced by sales of product imitations, i.e. products that are new to an enterprise, but are already available from other firms on the market in a very similar form. Although such products are new from the point of view of the enterprise that introduces them, they are not new to the economy as a whole.

In contrast, the share of turnover from market novelties measures the impact of completely new product innovations on turnover. The values of this indicator lie far below those for the share of turnover from all new products. In manufacturing, 6.4% of overall turnover (i.e. including non-innovators) could be attributed to market novelties in 2006. This is down very slightly on the 2005 value. The share in knowledge-intensive services (excluding banking and insurance) fell for the second year running, giving a value of 4.7% for 2006. In banking and insurance, only 1.2% of turnover was due to the firms offering completely new services. The corresponding figure for other services is 1.5% of the aggregate turnover. Looking back over a longer period, a declining trend emerges, as was the case for the share of firms with market novelties.

Cost savings and improvements in quality

Cost-saving process innovations ("rationalisation innovations") are new or significantly improved production, delivery or distribution methods that lead to a reduction in the average unit costs of production or service delivery. They are a means of increasing a firm's competitiveness on the basis of price.

Quality-improving process innovations are new or significantly improved production, delivery or distribution methods that increase the quality of a product or service. They are often linked to product innovations. Improved quality typically enhances a firm's sales opportunities. Information on quality-improving process innovations has been registered in the innovation survey since 2002.

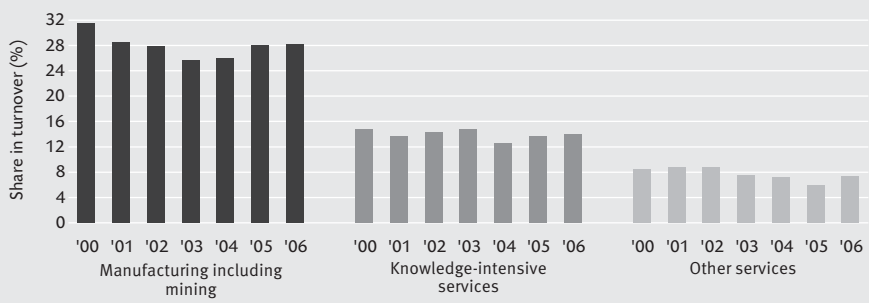
No Clear Trend in Cost-Saving Process Innovations

One way of measuring how successful process innovations have been is to see how unit costs have been cut. Looking at the costs for all manufacturing enterprises (i.e. including those without cost-saving process innovations), it emerges that costs were cut by 4.9% by new or improved processes. This represents no change from the previous year. In the two service groupings, on the other hand, such rationalisation innovations proved less successful than in 2005. The unit costs were cut by 3.3% in 2006 in knowledge-intensive services and by 1.4% in other services. Only in banking and insurance were able to obtain higher cost savings than previously. Enterprises here saw a 6% cost cut thanks to process innovations.

The success of quality-improving process innovations is measured using the increase in turnover that can be attributed to the quality improvements made. This indicator shows completely opposite trends in manufacturing and services. Its value in manufacturing rose sharply from 3.7% to a record high of 4.5% in 2006. The two service sector groupings, on the other hand, both recorded their lowest values since 2003. Quality improvements increased turnover by 2.7% in knowledge-intensive services and 1.2% in other services.

Research and experimental development (R&D) is one of the central components of innovation activity. Almost 50% of total innovation expenditure is on internal or external R&D. The share is larger in manufacturing and smaller in services. The share of firms engaging continuously in internal R&D serves as a measure of the extent to which innovation activities focus on the production of new knowledge. It is thus an indicator of how much demand innova-

Share of turnover due to product innovations, 2000 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
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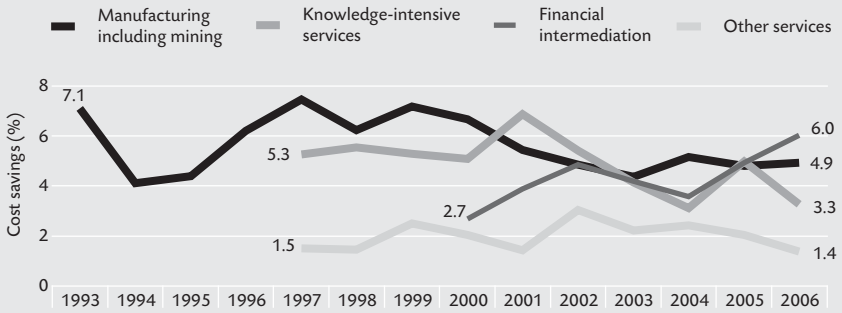
Indicators of innovation success

The share of turnover from product innovations refers to revenue from the year in question that has been acquired with new or markedly improved products/services introduced in the previous three-year period. **The share of turnover from market novelties** and **product-range novelties** refer to revenue from the year in question acquired thanks to market novelties and product-range novelties released in the previous three-year period.

The **share of unit costs reduced through process innovations** refers to costs from the previous year that were reduced through process innovations from the previous three-year period. **Increase in turnover due to quality improvements** measures the increase in revenue compared to the previous year that can be put down to quality improvements that were realised thanks to process innovations introduced in the previous three years.

Cost savings thanks to process innovations, 1994 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. Values for other services from 2000 on are only partially comparable with those from previous years. No values were recorded for service sectors before 1997. Knowedge-intensive services excluding banking/insurance. All values are projected for the total firm population in Germany.

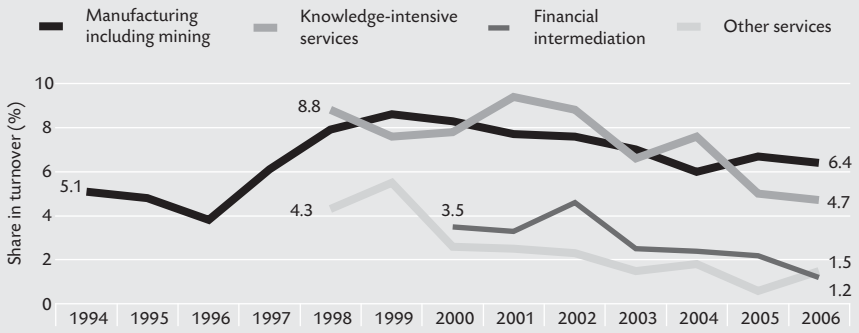
tive plans place on the development of new technologies and methods.

The results of the innovation survey point to reduced involvement in R&D in the German economy in 2006. The share of manufacturing enterprises engaged in continuous R&D activity fell to 23%, the same level as in 2002. The decline that had been observed since 2004 among knowledge-intensive service firms came a halt. The share of firms conducting continuous R&D remained at 15% in 2006. Continuous R&D is traditionally uncommon in other services. The share for this sector grouping was stable at 3%.

While there was a reduction in the share of enterprises engaging in continuous R&D, the share of those that conduct occasional R&D increased slightly. It was up by one percentage point in manufacturing (18%) and knowledge-intensive services (10%). There was a large increase in other services, where the share was up from 6% to 10%.

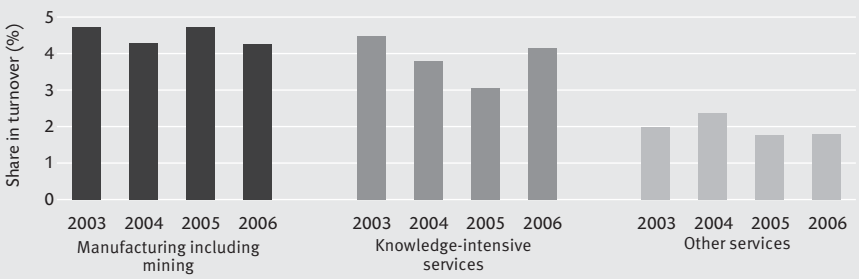
In manufacturing, 65% of innovation active enterprises – this includes successful innovators but also those that abandoned innovation activities before completion or that have ongoing innovation activities – conducted R&D of their own in 2006. This share is below that recorded in 2005, when almost three-quarters of innovation active manufacturers conducted R&D activities internally. This drop marks a reversal in the trend that started in the mid-1990s towards ever more focus on R&D among innovation activities. The picture in knowledge-intensive services is similar. In this sector grouping, 47% of innovation active enterprises conducted internal R&D in 2006. This share is markedly lower than at the beginning of the millennium, when it reached more than 50%. In other services, 35% of innovation active enterprises were engaged in R&D. This is below the peak value of 41% attained in 2004.

Share of turnover due to market novelties, 1994 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. Values for other services from 2000 on are only partially comparable with those from previous years. No values were recorded for service sectors before 1998. Knowedge-intensive services excluding banking/insurance. All values are projected for the total firm population in Germany.

Turnover due to product range novelties, 2003 to 2006

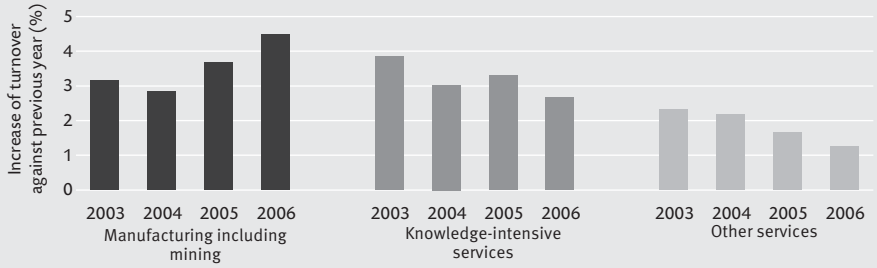


Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. All values are projected for the total firm population in Germany.

Continuous R&D in Decline among Manufacturers

Research and experimental development (R&D) is one of the central components of innovation activity. Almost 50% of total innovation expenditure is on internal or external R&D. The share is larger in manufacturing and smaller in services. The share of firms engaging continuously in internal R&D serves as a measure of the extent to which innovation activities focus on the production of new knowledge. It is thus an indicator of how much demand innovative plans place on the development of new technologies and methods.

Increase in turnover due to quality improvements, 2003 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. All values are projected for the total firm population in Germany.

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Widening the Concept of Innovation: Marketing and Organisational Innovations

The Oslo Manual, which contains OECD-wide criteria for the definition and measurement of innovation activities, was revised in 2005. The traditional concept of innovation used up to now comprised product and process innovations. Two new complementary aspects were added to widen the scope of what is understood by innovation. These are the implementation of new marketing methods and of new organisational methods. These types of innovation activity were covered for the first time in the 2007 survey.

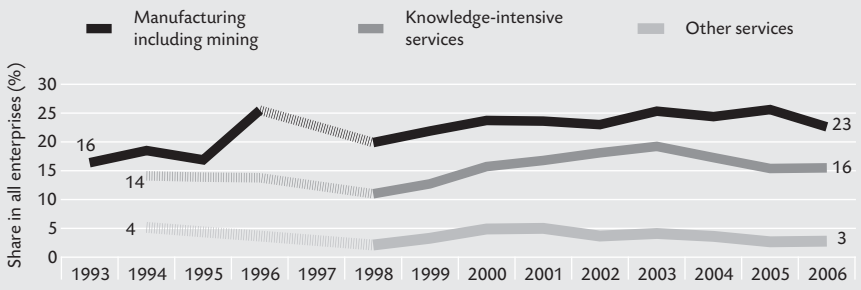
In manufacturing, 56% of enterprises implemented marketing innovations in 2006 and 60% organisational innovations. As such, each of these types of innovation is as common as product and process innovations added together. The share of enterprises that implemented at least one marketing or organisational innovation stands at 73%. This is well above the traditional innovation rates recorded to date. 43% of manufacturing enterprises implemented both organisational and marketing innovations.

In knowledge-intensive services, 43% of enterprises implemented marketing innovations. This is a lower proportion than in manufacturing. When it comes to organisational innovations, the share of 59% is similar to that for manufacturing enterprises. Taken together, 68% of knowledge-intensive service firms recorded one or more of the two new types of innovation. The traditional innovation rate for the sector grouping is much lower, at 52%. The two new categories of innovation are less prevalent in other services. 54% of enterprises here implemented at least one marketing or organisational innovation. The share of marketing innovators (38%) was lower than that of organisational innovators (43%). Nevertheless, the shares for both of these types of innovation are above the traditional innovation rate (33%). If product, process, marketing and organisational innovations were all taken into account when calculating the innovation rate, manufacturing (including mining) would see its innovation rate rise to 79%, knowledge-intensive services to 76% and other services to 62%. The innovation rate for the economy as a whole would be 71% rather than 45%. The greatest increase in the innovation rate owing to the broader concept of innovation is to be found in other services. The innovation rate rises by 29 percentage points compared to that for product and process innovations when the new categories are included. This is followed by

R&D Activities

Research and development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, and the use of this stock of knowledge to devise new applications, such as new or markedly improved products and services or processes and methods (including software development). This definition corresponds to that which is presented in the Oslo Manual and thereby also complies with the OECD's Frascati Manual on surveying research and experimental development.

Enterprises conducting continuous R&D, 1993 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. Values for 1997 and 1995 were not recorded and are interpolated in this figure. Values for services are only available from 1994 onwards. All values are projected for the total firm population in Germany.

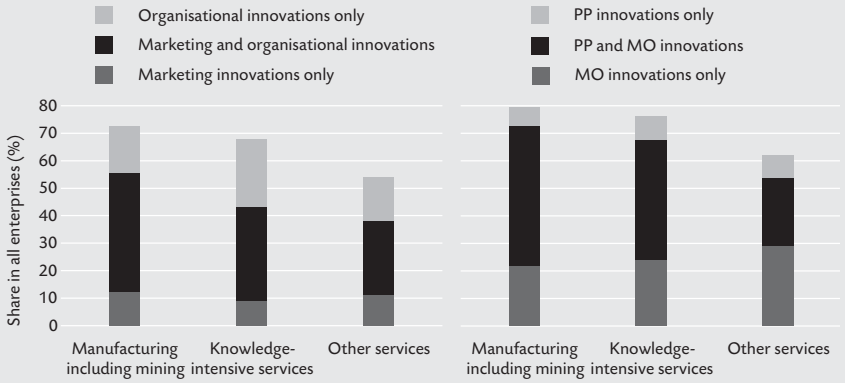
Marketing and organisational innovations

A **marketing innovation** is the introduction of a new method of marketing or selling, which has never previously been used by the enterprise in question. Marketing innovations are part of a new marketing concept or strategy. They go hand-in-hand with substantial changes in the area of product or service design, packaging, advertising, distribution, presentation or pricing policy.

An **organisational innovation** is the introduction of a new method of organisation, which has never previously been used by the enterprise in question. Organisational innovations are the result of strategic decisions by management. They may affect business processes, workflows or how external relationships are organised.

Marketing and organisational innovations are reported with reference to the previous three years, in the same way as product and process innovations.

Enterprises with marketing and organisational innovations, 2006



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Provisional values. PP: product or process innovations. MO: marketing or organisational innovations. All values are projected for the total firm population in Germany.

knowledge-intensive services (+24 percentage points) and manufacturing (+22 percentage points). Only a small minority of enterprises implement product and process innovations without bringing in marketing or organisational innovations at the same time. The share of firms that only conduct product and/or process innovations is between 7% and 8% in each of the sector groupings.

Innovation Activities at Industry Level

Innovation indicator values vary greatly from industry to industry. The innovation rate in 2006 ranged from 23% (transport/postal, wholesale trade) to 81% (electronics industry). Innovation intensity took values from 0.4% (wholesale trade) to 9.5% (technological services). The share of turnover due to new products was between 0.5% (mining) and 57% (automobiles). Depending on the indicator used, different sectors prove to be "most innovative":

- Topping the list in 2006 in terms of the innovation rate is the electronics industry, with 81%. It is followed by chemicals (78%) and manufacture of instruments (77%). Other industries that attained innovation rates of above 70% are mechanical engineering, IT and telecommunications (between 71% and 73%). The highest level of R&D conducted – measured as the share of enterprises that carry out R&D on a continuous basis – was to be found in the chemical industry (56%), followed by instruments (49%), electronics (47%) and mechanical engineering (37%). This is the same pattern as in previous years.
- If the broader concept of innovation, which includes marketing and organisational innovations, is used to calculate innovation rates, the various industries remain largely in the same order. Electronics, chemicals and instruments continue to top the list, while energy/water, mining and transport/postal services remain at the bottom. Food and drink, wholesale trade, furniture, sports equipment and toys and games are all industries that show a comparatively high share of marketing and organisational innovations compared to product and process innovations.
- In terms of absolute expenditure on innovation, the automotive industry retains the top spot it has occupied for many years. The overall order is also largely unaffected. In 2006, the German automotive industry spent €28.1bn in the area of innovation. It was followed by the electronics industry (€14.3bn), chemicals (€11.8bn), mechanical engineering (€10.7bn) and IT/telecommunications (€9.0bn). The banking and insurance industry, too, has a high innovation budget, totalling €7.8bn. These six industries account for 71% of total expenditure on innovation in the German economy.
- The highest value for innovation intensity in 2006 was recorded by technological and R&D-related services, with 9.5%. This was followed by 8.6% for the electronics industry, 8.5% for instruments and 7.7% for automobile manufacturing. The industries that led the way in terms of absolute volumes of innovation spending, namely IT/telecommunications, mechanical engineering and chemicals/pharmaceuticals/petroleum, follow some distance behind. Innovation intensity is particularly low among banking and insurance enterprises, at just 0.8%.
- In terms of the turnover due to new products, the automotive industry again set a new record in 2006, with €209bn. This amounts to 28% of the German economy's sales revenue from product innovations. Sales of new products account for 57% of turnover in the automotive industry, the highest value for any industry. Other industries with high absolute sales revenue from innovation are banking/insurance, electronics, mechanical engineering, chemicals and even wholesale trade. However, these large amounts do not all account for correspondingly large shares of industry turnover. While electronics (45%) and mechanical engineering (32%) achieve a considerable proportion of turnover with new products, the share is smaller in chemicals (17%), banking/insurance (12%) and wholesale trade (8%). The instruments industry and IT/telecommunications also have large shares of turnover due to product innovations (31% and 28% respectively).
- The other indicators for success with product innovations show the various industries in a similar order. The highest share of turnover from market novelties was achieved in the automotive industry (12.6%), followed by electronics (9.6%), technical/R&D-related services

Indicators of innovative activity in 2006, by industry

	Share of innovators %	Share of enterprises conducting continuous R&D %	Innovation expenditure €bn	Innovation intensity %	Turnover with new products €bn	Share in turnover with new products %	Share in turnover with market novelties %	Share in turnover with product line novelties %	Cost savings through process innovation %	Increase in turnover due to quality improvements %	Enterprises with marketing or organisational innovation %	Extend share of innovators %
Mining and quarrying	35	7	0.4	1.5	0.1	0.5	0.2	0.2	4.7	1.8	46	56
Food/beverages/tobacco	49	8	2.6	1.6	12	8	1.5	2.5	3.3	2.6	78	81
Textiles/clothing/leather	58	16	0.8	3.1	6	22	7.9	2.9	3.1	3.0	71	78
Wood/paper/printing/publish.	51	7	2.5	2.5	10	10	2.9	3.2	2.5	2.3	70	75
Chemicals/pharmaceuticals/oil	**78**	**56**	**11.8**	4.3	47	17	2.3	2.0	4.8	**5.8**	**81**	**91**
Rubber/plastics	57	19	2.2	3.3	11	16	5.1	5.0	4.0	4.2	72	82
Glass/clay/mineral products	53	19	1.0	2.6	5	14	3.8	2.4	4.2	2.4	68	79
Metal production/processing	44	15	4.2	2.1	21	11	2.8	2.3	5.1	4.3	63	68
Mechanical Engineering	73	37	10.7	5.4	64	**32**	**8.8**	5.1	4.6	3.2	78	87
Electrical eng./electronics	**81**	**47**	**14.3**	**8.6**	**75**	**45**	**9.6**	5.1	**11.1**	4.3	**83**	**91**
Instruments	**77**	**49**	3.5	**8.5**	13	31	6.5	**6.3**	**5.8**	3.9	**87**	**93**
Transport equipment	66	31	**28.1**	7.7	**209**	**57**	**12.6**	**7.5**	4.9	**6.7**	76	84
Furniture/toys/recycling	46	18	0.7	2.1	7	19	4.1	3.7	2.0	1.3	71	74
Electricity/gas/water supply	34	3	2.2	0.9	10	4	0.6	0.4	1.9	1.5	57	65
Wholesale trade	39	4	2.7	0.4	52	8	1.2	1.3	0.9	1.1	65	72
Transport/post	23	2	4.4	2.1	12	6	2.1	2.5	2.0	1.7	40	47
Financial intermediation	48	13	7.8	0.8	**118**	12	1.2	4.0	**6.0**	2.3	68	70
Computer activit./telecomm.	71	30	9.0	6.8	37	28	5.2	5.2	4.1	**5.2**	81	90
Engineering services/R&D	59	32	3.9	**9.5**	7	17	7.9	**7.4**	2.5	3.6	71	81
Consultancy/advertising	45	5	1.4	1.7	8	9	2.3	2.7	2.3	2.5	63	71
Other business services	39	3	1.0	1.3	6	8	2.3	4.4	3.9	1.5	60	71
Motion picture/broadcasting	50	10	0.3	2.7	2	20	4.6	4.4	2.1	3.0	68	79

Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Provisional values. The three industries with the highest values are shown in bold. All values are projected for the total firm population in Germany.

(7.9%) and textiles (also 7.9%). These industries also achieve high shares of turn-over due to product-range novelties, as do instruments, banking/insurance, IT/communications and rubber/synthetics.

- The greatest economic success with process innovations can be found in the electronics industry, banking/insurance and instruments, in terms of cost savings. When it comes to turnover growth resulting from better-quality products, the automotive industry, IT/telecommunications and chemicals lead the way.

Further information, in German, on the development of a number of other indicators, as well as an inter-industry comparison of innovation performance for 21 industry groups, can be found in the "ZEW Branchenreport Innovation", which can be downloaded from www.zew.de/innovation.

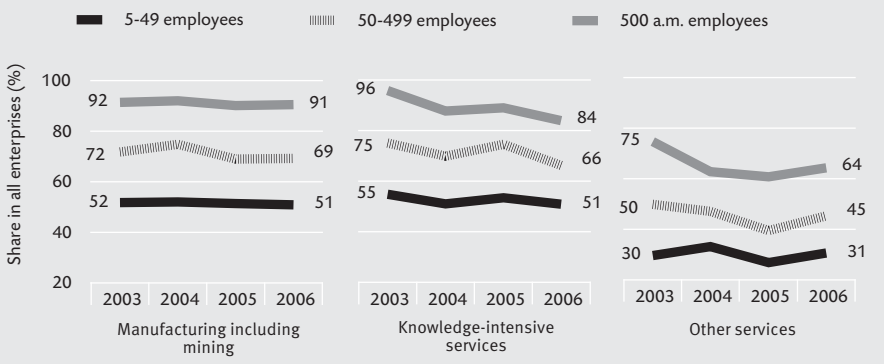
SMEs: Expenditure Stable but Market Success on the Rise

The innovation rate tends to rise as enterprise size – measured here as the number of employees – increases. Nine out of ten large enterprises (500 employees or more) in manufacturing and knowledge-intensive services reported successful product and process innovations and just under two-thirds did so in other services. The share of medium-sized enterprises that implemented innovations was around 70% in manufacturing and knowledge-intensive services and just under half in other services. In the group of small enterprises, i.e. those with between 5 and 40 employees, only every second enterprise counts as an innovator in manufacturing and knowledge-intensive services. For other services this falls to one in three.

The innovation rate remained stable overall among small and medium-sized enterprises (SMEs) in 2006. However, the two service sector groupings registered contrary trends. While SMEs in other services became increasingly involved in innovation, the share of innovative SMEs in knowledge-intensive services declined.

As SMEs make up a large share of the total number of enterprises in Germany, their behaviour has a decisive impact on

Innovation rate by size category, 2003 to 2006



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. All values are projected for the total firm population in Germany.

SMEs

Small and medium-sized enterprises (SMEs) are all firms with not less than 5 and not more than 500 employees. SMEs determine those innovation indicators that refer to shares of the number of firms (such as the share of innovators) since SMEs account for 97 to 99.5% of all enterprises, depending on the sector. However, they have a limited influence on overall expenditure and shares of turnover.

the innovation rate. However, they only have a limited influence on how innovation expenditure develops. SMEs accounted for only 28% of German innovation expenditure in 2006. In the mid-1990s, the share was somewhat higher, at around one third. Manufacturing SMEs account for a particularly low share of their sector grouping's innovation expenditure (22%). The corresponding share is much higher in knowledge-intensive services (42%) and other services (41%).

Manufacturing SMEs spent €18.6bn on innovation in 2006, marking a moratorium in the previous upwards trend. However, they plan a substantial rise in 2007, to take expenditure to around €20bn. It is then set to remain constant in 2008. In knowledge-intensive services, SMEs' innovation expenditure matched the previous year's level in 2006, at €9.2bn. However, a 5% rise is predicted for 2007 and the new level should be maintained in 2008. The year 2006 saw a strong increase among other service SMEs, with expenditure up 10% to €3.2bn. However, cutbacks are planned in subsequent years.

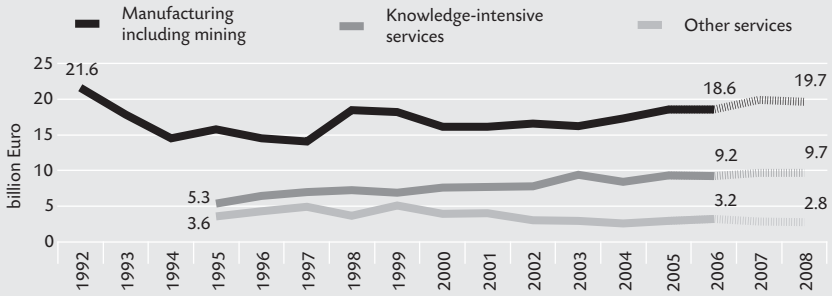
In manufacturing, SMEs demonstrate much lower innovation intensity than large enterprises. While SMEs in manufacturing spent 3.0% of turnover on innovation projects, the figure was almost twice as high among large enterprises. In contrast, SMEs in the knowledge-intensive services sector grouping spend a higher share of their turnover on innovation (2.2% compared to 1.6% among large enterprises). This is primarily because of higher innovation intensity among SMEs in banking/insurance. In other services, SMEs have a slightly lower innovation intensity than large enterprises.

SMEs enjoyed peak levels of success with products new to the market in 2000 and 2001, but have subsequently experienced a clear decline in this area. In 2006 there was a return to the upwards trend – albeit from a low starting level – at least in terms of success with completely new products. SMEs in manufacturing experienced an increase in turnover due to market novelties, taking the share to 3.6%. This is still well below the 7.9% share recorded by large enterprises. In knowledge-intensive services (excluding banking and insurance) the 4% share was the highest since 2003 and served to close the gap on large enterprises (at 5.6%) to a large extent. In other services, the share of turnover from market novelties rose to 1% in 2006, still half of the value reported by large enterprises.

The share of turnover due to all categories of new products experienced a similar development to the share of turnover from market novelties. The relative success of SMEs and large enterprises also showed a similar pattern.

SMEs' success with process innovations remained at the same overall level as the previous year. An increase in manufacturing compensated for a slight decline in the service sector groupings. Manufacturing SMEs achieved unit cost reductions of 3.5% thanks to process innovations in 2006. The last time this level of success was recorded was in 2000. Nevertheless, this remains below the large enterprises' savings through rationalisation (5.7%). In knowledge-intensive services, innovation-based cost savings amounted to 2.3%, which is both below the previous year's level and a long way short of the figure of 4.4% achieved by large enterprises. Cost savings in other services fell to 0.7%, the lowest level since 1997. Large enterprises in this sector grouping managed to cut costs by 2.2% thanks to process innovations.

SMEs' innovation expenditure, 1992 to 2008



Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. Service sector values only available from 1995. Values for other services from 2000 on are only partially comparable with those from previous years.
Data for 2007 and 2008 are based on enterprises' plans/expectations. All values are projected for the total SME population in Germany.

Eastern Germany: A High price for Low Success Rates and Few Innovators

Innovation activities in the eastern German economy have long been characterised by a number of unique features, and 2006 brought no real change in this respect. The eastern German innovation rates in all of the main sector groupings lie below those in the west of the country. The gap is smaller in manufacturing (east: 55% compared to west: 58%), somewhat larger in knowledge-intensive services (48% to 53%) and amounts to a veritable gulf in other services (21% compared to 35%). From a short-term point of view, knowledge-intensive service enterprises in the east succeeded in closing the gap in involvement in innovation somewhat in 2006. At the same time, however, the gap widened in other services.

The opposite pattern emerges when looking at innovation intensity. Eastern German enterprises as a group spend more of their turnover on innovation than their western counterparts. This is particularly noticeable in knowledge-intensive services. This gap seems to have narrowed somewhat recently, however, with knowledge-intensive service enterprises in the west recording an innovation intensity of 5.3% in 2006, compared to 8.2% in the east. In manufacturing, the 2006 value of 5.2% for eastern Germany is only slightly above the 4.8% recorded in the west. Eastern Germany's lead in innovation intensity is particularly striking considering that the economy in the east is characterised by a much larger share of SMEs, which have much lower innovation intensity overall than large enterprises.

The higher innovation intensity in manufacturing can be put down to a higher share of investment expenses for innovation. The share is 46% in the east compared to 29% in the west. In knowledge-intensi-

Innovations in Eastern Germany

In order to generate representative figures on innovation activities by firms located in eastern Germany, the sample of the ZEW innovation survey is stratified for all industry and size classes by east and west. Eastern Germany consists of the following six Federal States: Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt und Thuringia. Eastern German firms are defined as those firms that have their registered head office in one of the Federal States mentioned above. Subsidiaries of western German firms in eastern Germany that are not organised as separate legal entities are not part of the eastern German enterprise sector as defined here.

ve services, less of total innovation expenditure goes on investment. Particularly high innovation expenditure in technological services (engineering, R&D services, IT) plays a large part in the above-average innovation intensity recorded here.

Eastern Germany enjoyed markedly less success from innovations than the west of the country. There are clear gaps between east and west in the values of all of the success indicators. These gaps have shown no signs of closing in the past years. The share of turnover due to new products was 21% for eastern German manufacturing enterprises, compared to 29% in the west. In knowledge-intensive services the respective shares were 15% and 21%. The same pattern emerges for the share of turnover due to market novelties and for unit cost reductions achieved by process innovations. Only in other services does eastern Germany enjoy comparable success to the west. In the case of turnover due to new products, eastern German firms in this sector grouping even report a higher value than their western counterparts.

Looking at the eastern German enterprises' planned innovation activities, we can expect these clear differences to persist in 2007 and 2008. Going by the figures forecast by respondents, fewer eastern German than western German firms will be involved in innovation in 2007 and 2008. The only exception is in knowledge-intensive services, where the 2007 values for the two regions are comparable. This is partly because a large proportion of eastern German enterprises were not yet sure in spring 2007 whether they would carry out innovation activities in the course of the year. If a large number of these enterprises decide to go for product or process innovations, the eastern figure may approach that for the west, particularly considering that an overall decline in innovation involvement is expected among western German enterprises in 2007.

Eastern German innovation expenditure is expected to increase in all three sector groupings in 2007, making for a much more rapid expansion than in the western part of the country. This can be expected to widen the gap between eastern and western German innovation intensity. Eastern German knowledge-intensive service firms expect to extend their innovation budgets further still in 2008; their western German counterparts are looking to cut their budgets. On the other hand, eastern German manufacturers are planning to keep innovation expenditure constant in 2008, while it is expected to rise in the west.

East-west comparison of innovation activities and expenditure, 2004 to 2008

	Eastern Germany					Western Germany				
	2004	2005	2006	2007*	2008*	2004	2005	2006	2007*	2008*
Innovation activities (share of innovative enterprises, %)										
Manufacturing	58	60	61	a) 53 b) 66	49 66	65	63	63	a) 55 b) 68	51 67
Knowledge-intensive services	53	53	55	a) 41 b) 61	31 52	56	58	55	a) 47 b) 55	43 53
Other services	33	27	22	a) 20 b) 34	17 33	37	31	39	a) 28 b) 47	28 47
Innovation expenditure (billion €)										
Manufacturing	5.5	6.5	6.5	6.9	6.9	69.7	72.2	76.3	80.8	83.5
Knowledge-intensive services	2.0	2.5	2.2	2.4	2.5	16.3	18.5	19.9	21.2	20.5
Other services	1.0	0.6	0.8	0.9	0.8	6.9	6.6	7.2	6.8	6.4

Source: ZEW (2007): Mannheim Innovation Panel.
a) share of definitely innovation active firms; b) including also firms that or not yet sure whether they carry out innovation activities in 2007/08. Notes: Values for 2005 and 2006 are provisional. *Data for 2007 and 2008 are based on enterprise expectations in spring 2007.

East-west comparison of innovation indicators, 2004 to 2006

	Eastern Germany			Western Germany		
	2004	2005	2006	2004	2005	2006
Share of innovators (%)						
Manufacturing including mining	55	55	55	61	59	58
Knowledge-intensive services	48	46	48	53	56	53
Other services	30	25	21	36	30	35
Innovation intensity (%)						
Manufacturing including mining	5.2	5.6	5.2	5.0	4.9	4.8
Knowledge-intensive services*	9.6	8.9	8.2	4.5	5.1	5.3
Other services	1.7	1.0	1.2	0.9	0.8	0.8
Share of fixed investment in total innov. exp. (%)						
Manufacturing including mining	47	43	46	33	30	29
Knowledge-intensive services	26	25	27	40	42	39
Other services	68	70	65	60	68	68
Share in turnover due to new products (%)						
Manufacturing including mining	20.1	20.4	21.2	26.4	28.7	28.8
Knowledge-intensive services*	19.7	18.8	14.8	21.9	22.2	20.7
Other services	6.7	6.3	9.1	7.2	5.9	7.2
Share in turnover due to market novelties (%)						
Manufacturing including mining	3.5	4.8	4.2	6.1	6.8	6.5
Knowledge-intensive services*	5.1	5.5	3.9	7.8	5.0	4.8
Other services	1.9	0.6	1.6	1.8	0.6	1.5
Cost savings through process innovation (%)						
Manufacturing including mining	3.4	4.0	3.9	5.2	4.8	5.0
Knowledge-intensive services*	2.4	3.4	1.9	3.2	5.1	3.4
Other services	1.4	1.8	1.2	2.5	2.1	1.4

Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are provisional. *excluding financial intermediation.

Innovation Indicators for Manufacturing and Mining, 1994 to 2006

	1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Enterprises (1,000)	70	100	65	100	63	100	63	100	63	100	63	100	62	100	62	100	62	100	61	100	61	100	60	100	59	100
thereof:																										
Innovators	34	49	36	56	37	60	39	62	41	66	42	67	39	62	38	62	36	58	36	59	37	60	35	58	34	58
thereof:																										
Product innovators	n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		31	50	31	50	32	51	29	48	30	49	28	48	29	49
Process innovators	n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		24	38	21	34	19	31	21	35	22	36	22	37	21	36
Firms with market novelties	15	22	16	25	14	23	15	24	20	31	21	33	18	29	18	28	18	28	14	23	14	23	13	22	13	23
Firms with process innov. driven cost reduction	17	25	18	28	22	34	21	34	22	35	22	36	15	25	12	20	13	21	15	24	13	21	15	25	13	22
Firms with continuous in-house R&D activities	13	18	11	17	16	25	–	–	13	20	14	22	15	24	15	24	14	23	15	25	15	24	15	26	13	23
Employees (1,000)	7,287	100	7,100	100	6,795	100	6,751	100	6,738	100	6,725	100	6,768	100	6,773	100	6,656	100	6,518	100	6,435	100	6,346	100	6,322	100
thereof:																										
Innovators	5,776	79	5,825	82	5,664	83	5,871	87	5,950	88	5,871	87	5,628	83	5,671	84	5,497	83	5,429	83	5,423	84	5,203	82	5,142	81
Firms with continuous in-house R&D activities	4,216	58	4,151	58	4,340	64	–	–	4,049	60	4,093	61	4,123	61	4,288	63	4,137	62	4,058	62	3,990	62	3,987	63	3,835	61
Innovation expenditure (billion of €)	44.5	100	48.6	100	52.2	100	52.9	100	55.7	100	58.1	100	59.8	100	64.1	100	69.0	100	72.7	100	75.2	100	78.7	100	82.8	100
thereof:																										
Current expenditure	27.1	61	30.2	62	34.8	67	35.5	67	32.9	59	32.4	56	36.3	61	41.9	65	46.6	68	50.7	70	49.9	66	54.3	69	57.8	70
Capital expenditure	17.4	39	18.4	38	17.4	33	17.4	33	22.8	41	25.7	44	23.6	39	22.2	35	22.4	32	21.9	30	25.3	34	24.4	31	25.0	30
Share in turnover (%)		4.2		4.4		4.9		4.5		4.7		4.7		4.4		4.6		4.9		5.1		5.0		4.9		4.9
Innovation success (%)																										
Revenue share from product innovations		n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		31.4		28.5		27.8		25.7		25.9		28.1		28.2
Revenue share from market novelties		5.1		4.8		3.8		6.1		7.9		8.6		8.3		7.7		7.6		7.0		6.0		6.7		6.4
Share of cost reduction through process innovation		4.1		4.4		6.2		7.5		6.2		7.2		6.7		5.4		4.9		4.4		5.1		4.8		4.9

Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are tentative. Deviations from total due to rounding. "–": Figures not surveyed in that year. "n.s.": not shown due to lack in comparability to values from 2000 on. All figures are projected for the total firm population in Germany.
Total firm population: Firms with 5 and more employees in manufacturing and mining (NACE 10-37).

Innovation Indicators for Manufacturing and Mining – Small and Medium-sized Enterprises, 1994 to 2006

	1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Enterprises (1,000)	68	100	63	100	61	100	61	100	61	100	61	100	61	100	60	100	60	100	59	100	59	100	58	100	57	100
thereof:																										
Innovators	33	48	34	55	36	59	38	62	40	65	40	66	37	61	36	61	34	57	34	58	35	59	33	57	32	57
thereof:																										
Product innovators	n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		30	49	29	49	30	50	28	47	28	48	27	46	27	48
Process innovators	n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		23	37	19	32	18	29	20	34	20	35	21	36	20	35
Firms with market novelties	14	21	15	24	13	22	14	22	18	30	20	32	17	28	16	27	17	27	13	22	13	22	12	21	12	22
Firms with process innov. driven cost reduction	16	23	17	27	20	34	20	33	21	34	21	34	14	24	11	19	12	20	14	23	12	20	14	24	12	20
firms with continuous in-house R&D activities	12	17	10	15	15	24	–	–	11	18	12	20	13	22	13	22	13	21	14	24	13	23	14	24	12	21
Employees (1,000)	3,565	100	3,423	100	3,330	100	3,375	100	3,395	100	3,408	100	3,428	100	3,398	100	3,407	100	3,351	100	3,343	100	3,306	100	3,294	100
thereof:																										
Innovators	2,367	66	2,481	72	2,541	76	2,619	78	2,708	80	2,645	78	2,430	71	2,426	71	2,374	70	2,377	71	2,443	73	2,286	69	2234	68
firms with continuous in-house R&D activities	1,235	35	1,099	32	1,338	40	–	–	1,235	36	1,231	36	1,264	37	1,251	37	1,228	36	1,273	38	1,254	37	1,311	40	1,139	35
Innovation expenditure (billion of €)	14.5	100	15.8	100	14.5	100	14.1	100	18.5	100	18.3	100	16.2	100	16.2	100	16.6	100	16.2	100	17.3	100	18.6	100	18.6	100
thereof:																										
Current expenditure	6.8	47	7.5	47	7.7	53	7.1	51	8.3	45	8.6	47	7.5	46	8	50	8.9	54	9.4	58	9.4	55	10.8	58	10.9	59
Capital expenditure	7.8	53	8.3	53	6.8	47	6.9	49	10.2	55	9.7	53	8.7	54	8.2	50	7.7	46	6.8	42	7.8	45	7.8	42	7.6	41
Share in turnover (%)		3.3		3.7		3.3		3.2		4.1		3.9		3.2		3.2		3.2		3.1		3.1		3.2		3.0
Innovation success (%)																										
Revenue share from product innovations		n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		15.3		16		16.3		14.6		15.2		13.9		14.0
Revenue share from market novelties		3.7		3.6		3.7		4.1		5.7		5.7		4.9		5.8		4.5		4.1		4.5		3.1		3.6
Share of cost reduction through process innovation		3.6		3.6		4.7		4.3		4.2		3.9		2.7		2		2.1		2		2.4		3.2		3.5

Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are tentative. Deviations from total due to rounding. "–": Figures not surveyed in that year. "n.s.": not shown due to lack in comparability to values from 2000 on. All figures are projected for the total firm population of SMEs in Germany.
Total population of SMEs: Firms with 5 to 499 employees in manufacturing and mining (NACE 10-37).

Innovation Indicators for Manufacturing and Mining – Eastern Germany, 1994 to 2006

	1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Enterprises (1,000)	8.5	100	7.9	100	7.9	100	8.4	100	8.9	100	9.4	100	9.7	100	9.7	100	9.9	100	9.9	100	10.0	100	9.8	100	9.7	100
thereof:																										
Innovators	4.9	58	4.8	60	5.0	63	5.3	64	6.1	68	6.1	65	6.0	61	5.7	58	5.2	53	5.9	60	5.5	55	5.4	55	5.3	55
thereof:																										
Product innovators	n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		4.9	51	4.8	50	4.5	46	4.7	47	4.4	44	4.6	47	4.4	46
Process innovators	n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		3.5	36	2.8	29	2.9	29	3.8	39	3.4	34	3.1	31	3.3	34
Firms with market novelties	1.8	22	1.9	24	1.6	21	1.8	21	2.5	28	2.7	29	2.6	27	2.5	25	2.2	23	2.1	21	1.8	18	2.0	20	2.1	22
Firms with process innov. driven cost reduction	2.7	32	2.7	34	2.9	37	2.7	32	3.0	33	3.0	32	2.2	22	1.5	16	1.9	19	2.1	21	1.8	18	1.9	19	2.0	20
firms with continuous in-house R&D activities	2.5	30	1.8	22	2.2	28	–	–	2.4	27	2.9	31	2.7	28	2.7	28	2.4	25	2.5	26	2.4	24	2.6	26	2.4	24
Employees (1,000)	630	100	562	100	542	100	550	100	562	100	573	100	588	100	641	100	595	100	606	100	607	100	621	100	627	100
thereof:																										
Innovatoren	463	73	399	71	415	77	435	79	448	80	455	80	446	76	473	74	414	70	441	73	433	71	452	73	441	70
firms with continuous in-house R&D activities	285	45	237	42	256	47	–	–	265	47	267	47	255	43	310	48	243	41	263	43	262	43	282	45	245	39
Innovation expenditure (billion of €)	3.6	100	2.8	100	2.8	100	2.9	100	3.9	100	3.6	100	3.8	100	4.1	100	5.4	100	5.8	100	5.5	100	6.5	100	6.5	100
thereof:																										
Current expenditure	1.4	39	1.1	39	1.2	42	1.1	37	1.8	46	1.6	44	1.8	47	2.2	53	2.5	46	3.2	55	3.0	53	3.7	57	3.5	54
Capital expenditure	2.2	61	1.7	61	1.6	58	1.8	63	2.1	54	2.0	56	2.0	53	1.9	47	3.0	54	2.6	45	2.6	47	2.8	43	3.0	46
Share in turnover (%)		6.2		4.6		4.7		4.4		5.3		4.6		4.2		4.1		6.0		5.8		5.2		5.6		5.2
Innovation success (%)																										
Revenue share from product innovations		n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		23.1		28.6		16.2		19.4		20.1		20.4		21.2
Revenue share from market novelties		3.2		2.0		2.8		3.8		6.9		6.9		6.5		7.4		4.6		4.6		3.5		4.8		4.2
Share of cost reduction through process innovation		6.3		4.5		4.6		5.5		4.3		4.3		3.7		2.3		2.5		2.8		3.4		4.0		3.9

Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are tentative. Deviations from total due to rounding. "–": Figures not surveyed in that year. "n.s.": not shown due to lack in comparability to values from 2000 on. All figures are projected for the total firm population in Eastern Germany.
Total firm population: Firms with 5 and more employees in manufacturing and mining (NACE 10-37) in Eastern Germany (including West-Berlin).

Innovation Indicators for the Service Sectors, 2000 to 2006

	Knowledge-intensive Services *														Other Services **											
	2000		2001		2002		2003 a)		2004		2005		2006		2000		2001		2002		2003		2004 b)		2005		2006	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Enterprises (1,000)	89	100	83	100	86	100	78	100	79	100	81	100	82	100	96	100	93	100	92	100	94	100	97	100	96	100	98	100
thereof:																												
Innovators	52	59	48	58	46	53	44	56	41	52	44	55	43	52	43	45	38	41	33	36	31	33	34	35	28	29	32	33
thereof:																												
Product innovators	38	43	32	39	41	47	33	42	31	40	32	40	32	40	32	34	28	31	28	30	17	18	25	26	18	19	26	26
Process innovators	35	39	29	35	26	31	29	38	22	28	29	36	26	32	28	30	19	21	19	21	23	24	21	22	21	22	19	20
Firms with market novelties	19	22	16	19	17	20	12	16	13	16	11	14	11	13	12	13	11	12	12	13	5	5	7	7	5	5	8	8
Firms with process innov. driven cost reduction	17	19	16	20	12	13	15	20	9	11	13	17	9	11	10	11	8	8	9	9	11	12	9	9	10	11	10	10
firms with continuous in-house R&D activities	14	16	14	17	15	18	15	19	14	17	13	15	13	15	4.7	5	4.7	5	3.4	4	3.9	4	3.5	4	2.6	3	2.7	3
Innovation expenditure (billion of €)	16.2	100	15.9	100	17.5	100	18.7	100	18.3	100	21.0	100	22.1	100	6.7	100	7.1	100	8.4	100	7.8	100	7.9	100	7.2	100	8.0	100
thereof:																												
Current expenditure	9.7	60	9.3	58	11.2	64	12.5	67	11.3	62	12.6	60	13.8	63	3.3	49	3.4	48	3.7	45	2.6	33	3.1	39	2.3	32	2.6	32
Capital expenditure	6.6	40	6.7	42	6.3	36	6.2	33	7.0	38	8.4	40	8.3	37	3.4	51	3.7	52	4.6	55	5.2	67	4.8	61	4.9	68	5.4	68
Share in turnover (%)		1.7		1.6		1.7		1.8		1.7		1.9		1.8		0.9		0.9		1.1		1.0		1.0		0.8		0.8
Share in turnover (%), excl. banks and insurance		4.2		4.2		4.5		5.1		4.9		5.5		5.6														
Innovation success (%)																												
Revenue share from product innovations		23.9		28.2		23.3		24.9		21.7		21.9		20.2		8.5		8.8		8.7		7.5		7.2		5.9		7.3
Revenue share from market novelties		7.8		9.4		8.8		6.6		7.6		5.0		4.7		2.6		2.5		2.3		1.5		1.8		0.6		1.5
Share of cost reduction through process innovation		5.1		6.9		5.4		4.2		3.1		5.0		3.3		2.0		1.4		3.1		2.2		2.4		2.0		1.4

Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are tentative. Deviations from total due to rounding. All figures are projected for the total firm population in Germany.
* Total firm population: Firms with 5 and more employees in sectors banking/insurance, computer services and telecommunication, technical services, and consulting and advertising (NACE 64.3, 65-67, 72-73, 74.1-74.4). Innovation success indicators do not include banks and insurance.
* Total firm population: Firms with 5 and more employees in sectors wholesale trade, transport incl. postal services, and producer services (e.g. cleaning, security, provision of personnel, waste management) (NACE 51, 60-63, 64.1, 74.5-74.8, 90).
a) In 2003, some sub-sectors in the banks and insurance sector have been added to the total firm population surveye. b) In 2004, changes in official service sector statistics resulted in an expansion of total firm population figure. Both events may restrict comparability with prior years, especially with regards to innovation expenditure.

Innovation Indicators for the Service Sectors – Small and Medium-sized Enterprises, 2000 to 2006

	Knowledge-intensive Services*														Other Services**											
	2000		2001		2002		2003 a)		2004		2005		2006		2000		2001		2002		2003		2004 b)		2005		2006	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Enterprises (1,000)	88	100	82	100	85	100	78	100	79	100	81	100	81	101	95	100	92	100	91	100	93	100	96	100	95	100	97	100
thereof:																												
Innovators	51	58	47	58	45	53	44	56	41	52	44	55	42	52	42	45	37	41	32	35	30	32	34	35	28	29	31	33
thereof:																												
Product innovators	37	42	32	39	40	47	33	42	31	39	32	40	32	39	32	34	28	30	27	30	17	18	24	25	18	18	25	26
Process innovators	34	38	28	34	26	31	29	37	22	28	29	36	26	32	28	29	19	21	19	21	22	23	21	22	20	21	19	19
Firms with market novelties	19	21	15	19	17	20	12	16	13	16	11	13	11	13	12	13	11	12	12	13	4	5	7	7	5	5	8	8
Firms with process innov. driven cost reduction	16	19	16	19	11	13	15	19	8	11	13	16	9	11	10	10	7	8	8	9	10	11	8	9	10	10	10	10
firms with continuous in-house R&D activities	14	15	14	17	15	18	15	19	13	17	12	15	12	15	4.5	5	4.5	5	3.2	4	3.6	4	3.2	3	2.5	3	2.6	3
Innovation expenditure (billion of €)	7.6	100	7.7	100	7.8	100	9.4	100	8.5	100	9.3	100	9.2	101	3.9	100	4.0	100	3.0	100	2.9	100	2.5	100	2.9	100	3.2	100
thereof:																												
Current expenditure	4.5	59	5.0	65	5.1	65	6.5	69	5.4	64	6.2	66	6.3	69	1.8	45	1.8	44	1.3	44	1.2	41	1.3	51	1.3	43	1.4	42
Capital expenditure	3.1	41	2.7	35	2.7	35	2.9	31	3.0	36	3.2	34	2.9	31	2.2	55	2.2	56	1.7	56	1.7	59	1.2	49	1.7	57	1.9	58
Share in turnover (%)		2.3		2.3		2.0		2.5		2.3		2.4		2.2		0.9		0.9		0.7		0.6		0.6		0.6		0.6
Share in turnover (%), excl. banks and insurance		6.0		6.0		4.8		6.2		5.2		5.5		4.7														
Innovation success (%)																												
Revenue share from product innovations		19.1		18.9		17.0		22.3		16.6		17.2		14.6		5.8		7.5		6.8		5.3		4.5		4.6		6.4
Revenue share from market novelties		7.4		6.0		6.4		3.7		3.1		3.2		3.9		1.9		3.1		2.9		1.4		0.7		0.6		1.0
Share of cost reduction through process innovation		2.8		3.3		2.4		2.7		1.8		2.5		2.3		1.5		1.1		1.2		1.4		1.3		1.2		0.7

Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are tentative. Deviations from total due to rounding. All figures are projected for the total population of SMEs in Germany.
* Total population of SMEs: Firms with 5 to 499 employees in sectors banking/insurance, computer services and telecommunication, technical services, and consulting and advertising (NACE 64.3, 65-67, 72-73, 74.1-74.4). Innovation success indicators do not include banks and insurance.
** Total population of SMEs: Firms with 5 to 499 employees in sectors wholesale trade, transport incl. postal services, and producer services (e.g. cleaning, security, provision of personnel, waste management) (NACE 51, 60-63, 64.1, 74.5-74.8, 90).
a) In 2003, some sub-sectors in the banks and insurance sector have been added to the total firm population surveye. b) In 2004, changes in official service sector statistics resulted in an expansion of total firm population figure. Both events may restrict comparability with prior years, especially with regards to innovation expenditure.

Innovation Indicators for the Service Sectors – Eastern Germany, 2000 to 2006

	Knowledge-intensive Services*														Other Services**											
	2000		2001		2002		2003 a)		2004		2005		2006		2000		2001		2002		2003		2004 b)		2005		2006	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Enterprises (1.000)	13.1	100	12.1	100	12.4	100	11.4	100	11.4	100	11.7	100	11.8	101	16.1	100	15.4	100	15.2	100	15.4	100	15.8	100	15.8	100	16.0	100
thereof:																												
Innovators	7.8	59	6.5	54	5.4	44	5.8	51	5.5	48	5.3	46	5.7	48	6.9	43	5.4	35	4.8	32	4.0	26	4.8	30	4.0	25	3.3	21
thereof:																												
Product innovators	4.7	36	4.8	39	4.1	33	4.8	42	4.5	39	3.7	32	3.8	33	5.6	35	3.4	22	4.0	27	2.8	18	3.6	23	2.8	18	2.4	15
Process innovators	4.6	35	4.5	37	3.4	27	3.5	31	3.5	31	3.2	28	3.0	25	4.4	27	4.2	27	2.7	18	2.7	17	2.8	18	2.6	17	2.2	14
Firms with market novelties	2.9	22	2.3	19	1.5	12	2.8	24	1.7	14	1.5	13	1.3	11	2.9	18	1.2	8	1.5	10	0.9	6	1.2	8	1.4	9	0.7	5
Firms with process innov. driven cost reduction	1.8	14	3.1	25	1.3	11	1.4	12	1.3	12	1.4	12	0.9	7	1.6	10	1.3	9	0.6	4	1.6	10	1.1	7	1.6	10	0.8	5
firms with continuous in-house R&D activities	1.6	12	1.3	10	1.6	13	2.1	18	2.3	20	2.9	25	1.5	12	0.6	4	0.9	6	0.3	2	0.3	2	0.5	3	0.3	2	0.4	3
Innovation expenditure (billion of €)	0.8	100	1.3	100	1.9	100	2.0	100	2.0	100	2.5	100	2.2	101	1.0	100	1.4	100	0.9	100	0.5	100	1.0	100	0.6	100	0.8	100
thereof:																												
Current expenditure	0.5	58	0.8	66	1.4	73	1.4	69	1.5	74	1.9	75	1.6	73	0.4	38	0.5	38	0.4	38	0.2	33	0.3	32	0.2	30	0.3	35
Capital expenditure	0.3	42	0.4	34	0.5	27	0.6	31	0.5	26	0.6	25	0.6	27	0.6	62	0.9	62	0.6	62	0.3	67	0.7	68	0.5	70	0.5	65
Share in turnover (%)		2.2		3.1		4.6		4.2		3.0		3.6		2.8		2.0		2.7		1.7		0.9		1.7		1.0		1.2
Share in turnover (%), excl. banks and insurance		4.4		6.0		9.2		10.7		9.6		8.9		8.2														
Innovation success (%)																												
Revenue share from product innovations		19.6		16.2		19.0		19.9		19.7		18.8		14.8		7.5		9.1		6.0		9.1		6.7		6.3		9.1
Revenue share from market novelties		5.2		4.2		3.7		4.6		5.1		5.5		3.9		2.8		2.7		2.3		1.2		1.9		0.6		1.6
Share of cost reduction through process innovation		2.5		2.7		2.0		2.2		2.4		3.4		1.9		2.0		1.7		2.3		1.5		1.4		1.8		1.2

Source: ZEW (2007): Mannheim Innovation Panel.
Notes: Values for 2005 and 2006 are tentative. Deviations from total due to rounding. All figures are projected for the total firm population in Eastern Germany.
* Total firm population: Firms with 5 and more employees in sectors banking/insurance, computer services and telecommunication, technical services, and consulting and advertising (NACE 64.3, 65-67, 72-73, 74.1-74.4) in Eastern Germany (including West-Berlin). Innovation success indicators do not include banks and insurance.
** Total firm population: Firms with 5 and more employees in sectors wholesale trade, transport incl. postal services, and producer services (e.g. cleaning, security, provision of personnel, waste management) (NACE 51, 60-63, 64.1, 74.5-74.8, 90) in Eastern Germany (including West-Berlin).
a) In 2003, some sub-sectors in the banks and insurance sector have been added to the total firm population surveye. b) In 2004, changes in official service sector statistics resulted in an expansion of total firm population figure. Both events may restrict comparability with prior years, especially with regards to innovation expenditure.

The Mannheim Innovation Panel

On behalf of the German Federal Ministry of Education and Research (BMBF), the Centre for European Economic Research (ZEW) has conducted annual surveys on innovation behaviour of German enterprises in cooperation with the Institute for Applied Social Science (infas) and the Fraunhofer Institute for Systems and Innovation Research (ISI) since 1993. These surveys focus on all firms located in Germany that have at least five employees and are active in the manufacturing sector, mining, energy and water supply, knowledge-intensive services or other services.

The ZEW's annual innovation survey is designed as a panel survey (the "Mannheim Innovation Panel" – MIP); i.e. the same sample of firms is queried every year. Every two years the sample is refreshed by a random sample of newly founded firms to replace those that have ceased trading in the interim. The innovation survey is conducted alternately in its "long" form (including additional questions regarding framework conditions of innovation, such as innovation barriers) and "short" form (with questions limited to the core indicators of innovation performance). The 2007 survey was of the former variety.

The definitions and measurement concepts on which the survey is based follow the OECD and Eurostat recommendations for the collection and interpretation of data on innovation, as set our in the "Oslo Manual". The 2007 survey was the first to implement the changes made in the second (2005) revision of the Oslo Manual. Perhaps the most fundamental of these changes involved widening the concept of innovation to include marketing and organisational innovations. Every two years, the ZEW survey forms part of the Community Innovation Survey (CIS) conducted by Eurostat. The parameters for the CIS were laid down in law in 2004, in the form of EU Regulation (EC) 1450/2004. The 2007 survey was a CIS survey.

The 2007 sample comprises 29,985 firms and is stratified by sector, firm-size and region (eastern/western Germany). At least 2,457 of these had ceased trading, changed sector etc. and were counted as neutral losses, giving a corrected sample of 27,528 firms. The sample frame is custom-configured by the ZEW from the stock of firms listed in the CREDITREFORM database. The written survey took place between March and July 2007. 5,657 firms returned non-spoiled questionnaires, a response rate of 20.5%. In order to correct for a possible bias in the firms' response behaviour, another 4,592 enterprises were selected at random from the non-responding firms and interviewed by telephone regarding the survey's core variables (August-September 2007). As a result, the figures quoted in this report are derived from over 10,200 enterprises or 37.2% of the sample.

The results are projected for the total population of enterprises in Germany. The data on firm, employment and revenue figures for the total population of manufacturing, mining and most service sectors covered in the MIP (wholesale trade, transport, communications, most business-related services) are based on publications of the German Federal Statistical Office from the reference year 2005. The data for 2006 are based on extrapolations made by the ZEW on the basis of data from the Federal Statistical Office and are therefore preliminary. Data for the basic population in the sectors banking/insurance, waste disposal and media (film production, broadcasting) were compiled by the ZEW using information from various sources (corporate tax statistics, trade associations, federal agencies) and should therefore be treated as estimates. The size classification structure in the service sectors, values for manufacturing enterprises with 5-19 employees and East/West categorisation are partially based on ZEW estimates.

The European harmonisation of this survey instrument in the course of the 2001 Community Innovation Survey (CIS 3) led to changes in the way some questions were posed, which has in turn made comparisons with values from previous years more complicated or even impossible. Among the affected indicators were the number of product and process innovations, and revenues from product innovations; all of the "other service" indicators were also influenced. In this sector group, comparisons of some core values – share of innovators, for instance – cannot be made. Each of the remaining innovation indicators in other services is limited to a lower degree of comparability.

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