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# Innovation Activities in the German Economy

## Report on Indicators from the Innovation Survey 2001

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■ The high level of economic growth in 2000 did not stimulate a rise in innovation activity within the German economy. Innovation activity has receded, but nonetheless it remains on a high level when compared internationally. A further rise in innovative activity was hindered due to an increase in capacity utilisation that bound resources to production and sales. A lack of qualified personnel during the economic boom seriously hampered any ambitious innovation efforts, especially amongst small and medium-sized enterprises. The lack of qualified personnel has become the main factor hampering innovation across all observed economic sectors.

The share of innovative enterprises within the German industry has decreased from 67% in 1999 to 62% in 2000. Within the business-oriented service sectors (financial services, technical and IT support providers, consulting, as well as other services) the share of innovative enterprises has retreated to 60% from 63%. Especially affected were the traditionally innovative sectors, such as the chemical, manufacturing and automotive industries.

Due to the auctioning of the twelve UMTS licenses in 2000, the German economy increased their innovation expenditure significantly, by more than a third to 117 milliard €. Adjusted to account for the UMTS licenses, innovation expenditure dropped, though slightly, to 83 milliard €. Without large enterprises, innovation expenditure would have fallen more drastically. Small and medium-sized enterprises (SME) reduced their expenditure for innovative projects significantly by more than 4 milliard €. They observed a favourable demand environment and realised the opportunity for increased sales, and as a result innovative projects were postponed. With a value of 84 milliard € in 2001, innovation expenditure should almost reach the levels of 1999. A stable level of growth is expected for the middle-term.

The resource grouping in production and sales has substantially displaced innovative activity in short-term applications such as the implementation of new products and services for the market, and the introduction of new processes within the enterprise. However, fundamental research and development activities were not neglected, but rather expanded. In 2000 almost a quarter of all industrial enterprises and one in seven business-oriented service providers continuously worked on the generation of new knowledge and information. In 1998 only one in five enterprises and one in nine business-oriented service providers performed these activities. Only in East-Germany did the share of researching industrial enterprises decline from 31% to 26%. Possibly the introduction of more restrictive terms and conditions of public support can now be seen as research and development activities are normalising and adjusting themselves to West-German levels.

The economy-driven high demand for standard products and services bore, in the short run, heavily on turnover of market novelties, which are more costly to distribute. In the manufacturing industry, the turnover share due to market novelties fell to below 8% in 2000. However a rising long-term trend has begun. Using market novelties the business-oriented service providers were able to raise turnover share to 7% in the short-term. Thereby they should have preserved Germany's top spot in regards to innovation success on an international level.

The success of cost-reduction measures driven by process innovations in West-Germany is higher than in the mid 1990's. However, the savings volume has decreased slightly in 2000. Seven out of every hundred Euros were saved, compared to almost eight of every hundred in the previous year. A more noticeable savings decrease was seen in the East. The considerably lower capacity utilisation during the economic recovery phase in the East, is diminishing the incentive for Eastern enterprises to invest in measures to increase efficiency.

### Important Note

The 2001 ZEW Innovation Survey is the German contribution to the third European-wide Harmonised Community Innovation Survey (CIS 3). Due to Eurostat guidelines certain definitions had to be changed slightly and portions of the questionnaire had to be restructured. The harmonisation of the questionnaire also led to required changes in the yearly indicator reports.

One cannot exclude the possibility that an enterprise behaved differently when completing the answers for some survey questions. Therefore, as a precaution, several indicators for the current 2000 period will not be declared. These are the shares of enterprises with product innovations, the shares of enterprises with process innovations and the turnover share due to product innovations. For the distributive service sector only the values for 2000 will be given because a comparison with previous years is not possible for all indicators.

### Innovators/Innovations

Innovators are enterprises that have successfully completed at least one innovative project within a three-year period i.e. have introduced at least one innovation. Whether or not another enterprise has already introduced the same innovation does not matter; the only consideration is if it is an innovation for the enterprise in question.

Innovations may be in the area of products, services, processes or procedures. Product innovations are new or significantly improved products or services introduced to the market by an enterprise. Process innovations are new or significantly improved production technologies and methods of supplying and delivering products or procedures which have been introduced within an enterprise. New processes or procedures which are sold to other enterprises are product innovations.

The basic definitions and boundaries correspond to those set out by the OECD in the so-called Oslo manual.

## Innovation activity on a high international standard declined

The year 2000 in Germany was marked with the highest economic growth since the end of the reunification boom. According to data from the Statistisches Bundesamt (DESTATIS) the GDP increased by more than

3% over the previous year. However, this positive economic trend has not led to a further increase in innovation activity amongst German enterprises. On the contrary: The share of innovative enterprises in the German industry receded to 62% in 2000 compared to 67% in 1999. Even in the business-oriented service sectors innovation activity receded slightly from 63% in 1999 to 60% in 2000. During the economic upswing enterprises are focusing less on innovation and are rather solidifying the position of products or services within existing and expanding markets.

A high capacity utilisation of 87% in the manufacturing industry of West-Germany during 2000 (according to data from the ifo-Institut) is committing innovative resources. This applies particularly to small and medium sized enterprises in which innovation activities are not institutionalised and therefore compete directly for capacity against production and distribution activities. In order not to lose customers and to ensure market share, the existing qualified personnel that could be entrusted with innovative activities are desperately needed for regular business operations. In phases of economic growth, an existing shortage of qualified personnel is therefore amplified and this affects innovation efforts in a particularly harsh manner.

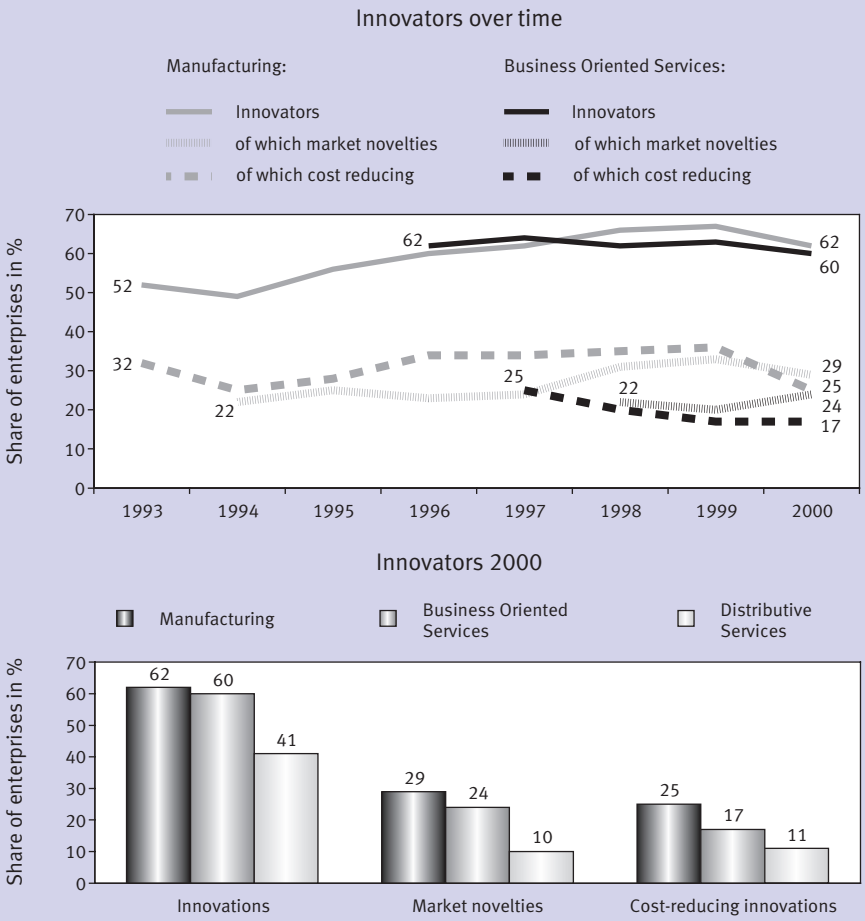
The general regression in innovation activity during 2000 was led by small and medium sized enterprises and hit the traditionally innovative sectors in particular. These include the chemical, mechanical engineering, and motor manufacturing industries which generally provide the decisive innovative strength within the German economy. The manufacturing industry shows a clear connection between capacity utilization and innovative activity. Capacity problems are especially noticeable in the mechanical engineering sector. In this sector the share of innovative SME receded 7 percentage points to 74%. According to the ifo-Konjunkturtest this sector in 2000 had a capacity utilization of 90%.

Only the share of innovative IT and telecommunication enterprises grew to 72%, representing an increase of over 10 per-

## Market Novelties

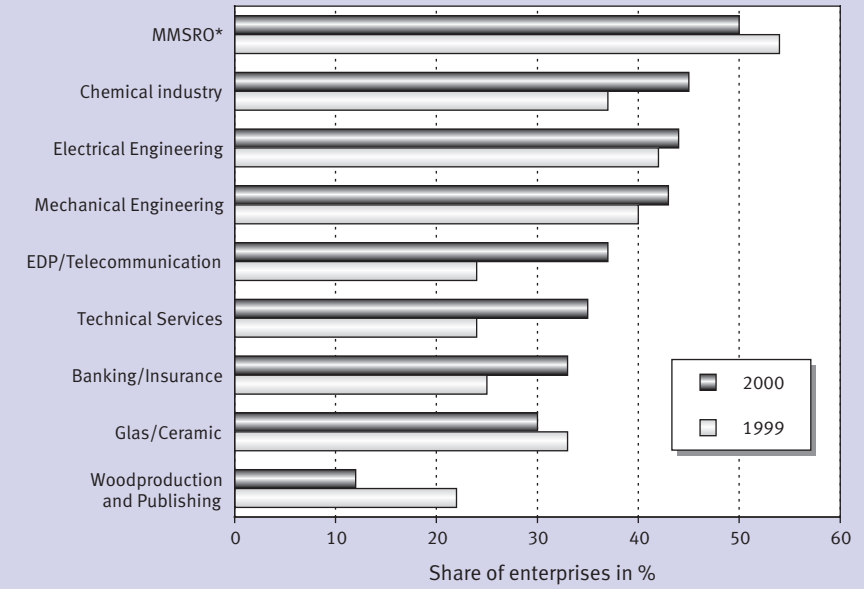
Market novelties are new or significantly improved products or services introduced to the market for the first time by an enterprise. The enterprise defines the relevant market.

## Innovation Activities 1993 to 2000




**Source:** ZEW (2002): Mannheim Innovation Panels
**Note:** Values for 1999 and 2000 are provisional. Those for the service sector are available only since 1996. Data for market novelties in the manufacturing industry have been levied for the first time in 1994, and 1998 for the service sector. Data for cost-reducing process innovations was first levied in 1997. All information is expanded for the German statistical population.

## Enterprises with Market Novelties in Selected Sectors




**Source:** ZEW (2002): Mannheim Innovation Panels.
**Note:** All information is expanded for the German statistical population. Values are provisional.
* manufacture of medical, precision and optical instruments

## Cost -Reducing Process Innovations

Cost-reducing process innovations are those which lead to a reduction in average costs and which tend to have a rationalisation motive as their basis. They will therefore also be called rationalisation innovations.

centage points. This sector displayed extraordinarily high growth during 2000. It was essentially here that most of the enterprises of the so-called "New Economy" were founded, and where the IPO boom took place on the so-called "Neuer Markt" (New Market). This growing sector introduces new products and services in such short intervals that the length of product lifecycle is constantly decreasing while the share of innovations within the product lines are increasing accordingly.

The share of enterprises with market novelties has also increased considerably within the IT and telecommunications sector from approximately one quarter in 1999 to clearly more than a third in 2000. The same applies to the technical services sector. In the banking and insurance sector, efforts to provide innovations have also increased. More than a third of financial service providers were able to introduce market novelties in 2000.

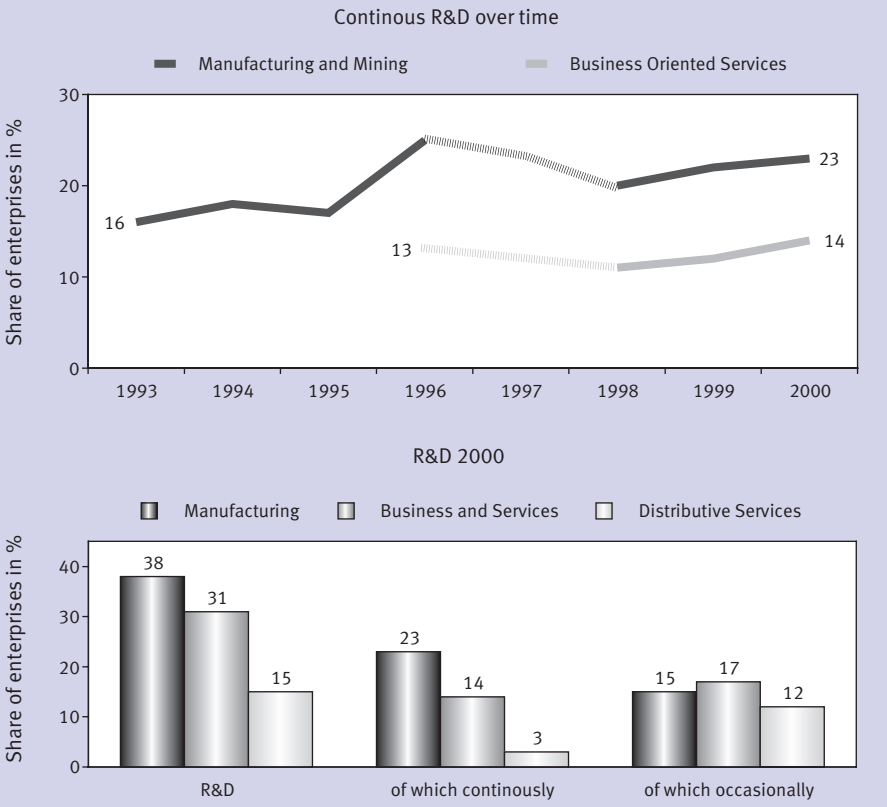
In contrast, the share of enterprises in the industry that introduced new products to the market in 2000, fell. In the R&D intensive sectors of the manufacturing industry, the share of enterprises with market novelties still remains highest at a level approximately ten percent higher than in the technology oriented service industry. The most R&D intensive industries consist of the chemical industry, mechanical engineering, electrical engineering, and the manufacture of medical, precision and optical instruments, with respective enterprises with market novelty shares of 45%, 43%, 44% and 50%.

Considerable differences can be seen between process innovations and product innovations. Industrial enterprises have significantly scaled back on innovation activities that focus on cost-reduction. This applies in particular to enterprises from R&D intensive sectors, such as medical, precision and optical instrument manufacturing enterprises, who notably reduced their rationalisation measures, from 42% of enterprises in 1999, to 22% of enterprises in 2000. The significance of rationalisation as a motive for innovative decisions is apparently declining.

While considerably fewer industrial enterprises implemented rationalisation innovations, more business-oriented service providers tried to cut costs through process innovations (almost one in five enterprises). The increase in rationalisation innovations amongst business-oriented service providers took place solely in West-German enterprises. In East-Germany, the share of enterprises that implemented cost-reducing process innovations within the year, fell slightly by around two percentage points. Only one in six enterprises could reduce costs due to process innovations.

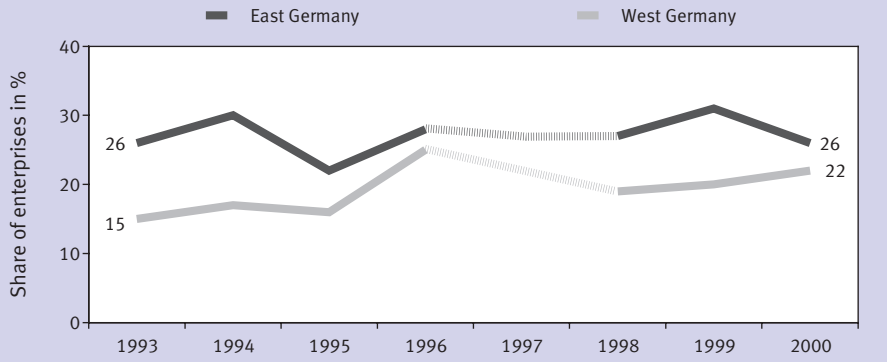
The innovative events in the distributive service sector, mainly in trade and commerce, differ considerably from the other economic sectors: only four in ten enterpri-

## Research and Development 1993 to 2000




**Source:** ZEW (2002): Mannheim Innovation Panels
**Note:** No values for 1997. Data for 1999 and 2000 is provisional and for the service sector only available since 1996. All information is expanded for the German statistical population.

## R&D in the Manufacturing Industry: East-West Comparisons 1993 to 2000




**Source:** ZEW (2002): Mannheim Innovation Panels
**Note:** Data not levied for 1997. 1999 and 2000 values are provisional. All information expanded for the German statistical population.

### R&D Activities

Research and Development (R&D) is to be understood as creative systematic work in order to increase the stock of knowledge and the use of this knowledge to devise new applications such as: new or significantly improved products, services or processes (including software development.) The definition corresponds to that of the Oslo manual published by Eurostat and hence also to the OECD's Frascati manual, that provides the official R&D statistical basis for WiStat (Stifterverband für die Deutsche Wissenschaft.)

ses characterise themselves as innovative. However, within the distributive service sector the share of innovators in the East is slightly higher than in the West.

## Continuous R&D of Increasing Importance

The readiness of German enterprises to engage in research and development (R&D) has continued to rise in contrast to the overall innovation activities. Since 1998, the share of enterprises engaging in R&D has steadily risen in almost all economic sectors. Shares within the manufacturing sector are 23% in 2000, compared with 20% in 1998, for business-oriented service providers 14% compared to 11% are continuously engaged in R&D activities.

The growing share of continuously researching enterprises shows that the strategic (and thereby rather middle and long term oriented) innovation efforts of the German economy have in no way receded. However, hampered by already full production capacity and the acute shortage of skilled labour, the realisation of short-term products and services is lagging behind to some degree.

In service sectors such as electronic data processing (EDP), telecommunication, and technology oriented service providers, the share of researching enterprises has clearly grown since 1998. Almost a quarter of these enterprises, and thereby clearly more than the average in the service sector, are continuously engaged in R&D. In general, the R&D activities are utilised in marketable products and services. This is seen in the large share of enterprises with market novelties in these economic sectors.

The growing R&D trend in the manufacturing industry is carried only by West-German enterprises. In East-Germany the share of enterprises with continuous R&D fell from 31% to 26%. This could possibly be the result of newly implemented restrictive funding conditions aimed at increasing the efficiency of R&D within East-Germany. The developments in the East should therefore be viewed as a normalisation stage in which the East adjusts to Western levels.

## Middle-term innovation expenditure stable, temporarily high because of UMTS licenses

Despite the decline in the share of innovative enterprises, partially due to economic conditions, the German economy greatly increased innovation expenditure in 2000. In the observed sectors, total innovation expenditure grew over a third from 85 milliard € to 177 milliard €.

The observed increase was caused by the auctioning of the UMTS licenses. (See box: Innovation Expenditure) German electronic data processing and telecommunications providers alone spent roughly 34 milliard € for the purchase of the twelve UMTS licenses (in total 48 milliard € was spent on the licenses). Because there is no offsetting turnover increase within the same period, innovation intensity (measured by innovative spending as a share of turnover) increased considerably to almost 4%. The enterprises thereby spent a much larger share of their turnover on innovation projects than in previous years.

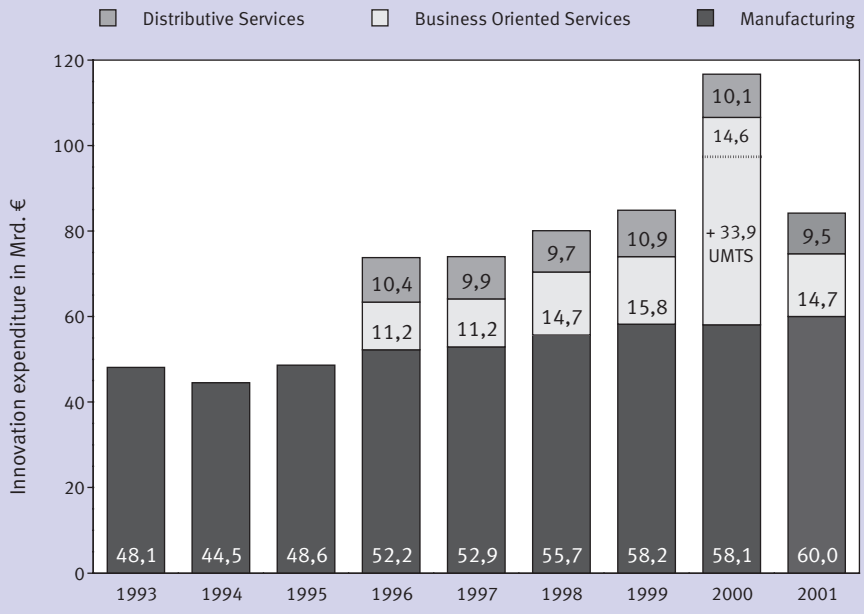
### SME

Small and medium-sized enterprises (SMEs) are enterprises with at least five and less than five hundred employees which dominate statistics on shares which refer to the number of enterprises due to their relatively strong presence. Their influence on expenditure and turnover however is limited.

Corrected for the expenditure on UMTS licenses, innovation expenditure receded slightly to 83 milliard €. Large enterprises alone are the reason innovation expenditure did not decrease further in 2000 (without UMTS). Their expenditure in 2000 grew by more than 4%, while small and medium sized enterprises reduced their innovation expenditure considerably by 13% or 4 milliard € down to 16 milliard € during the same period. Many small and medium sized enterprises saw a favourable demand environment in which to generate additional revenue and as a result the realisation of innovative concepts was initially deferred.

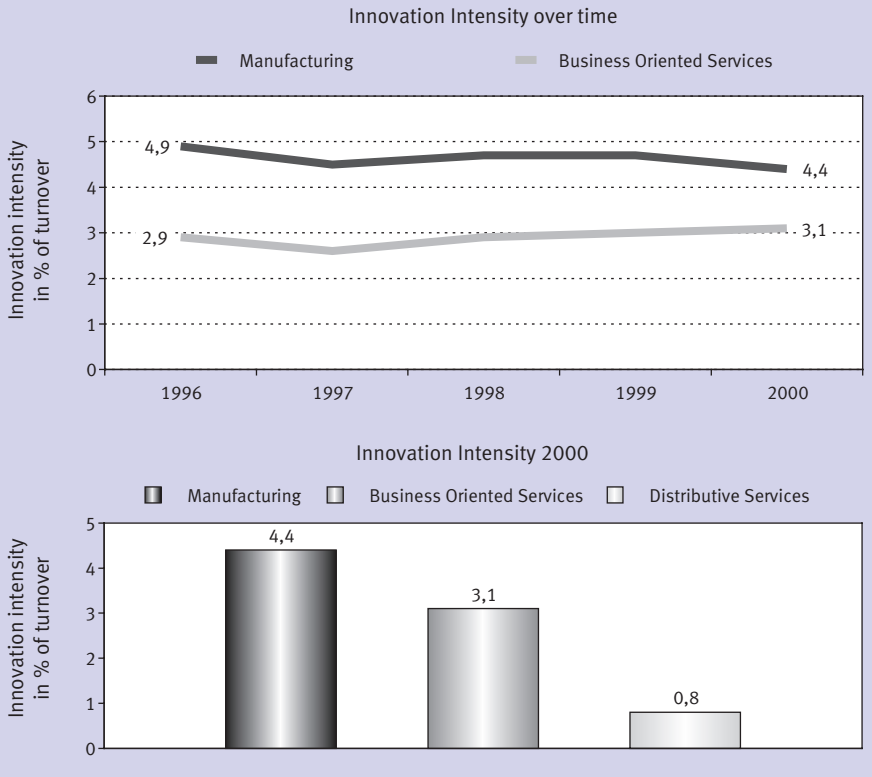
According to projections from the enterprises however, innovation expenditure of the German economy with an estimated va-

### Innovation Expenditure 1993 to 2001



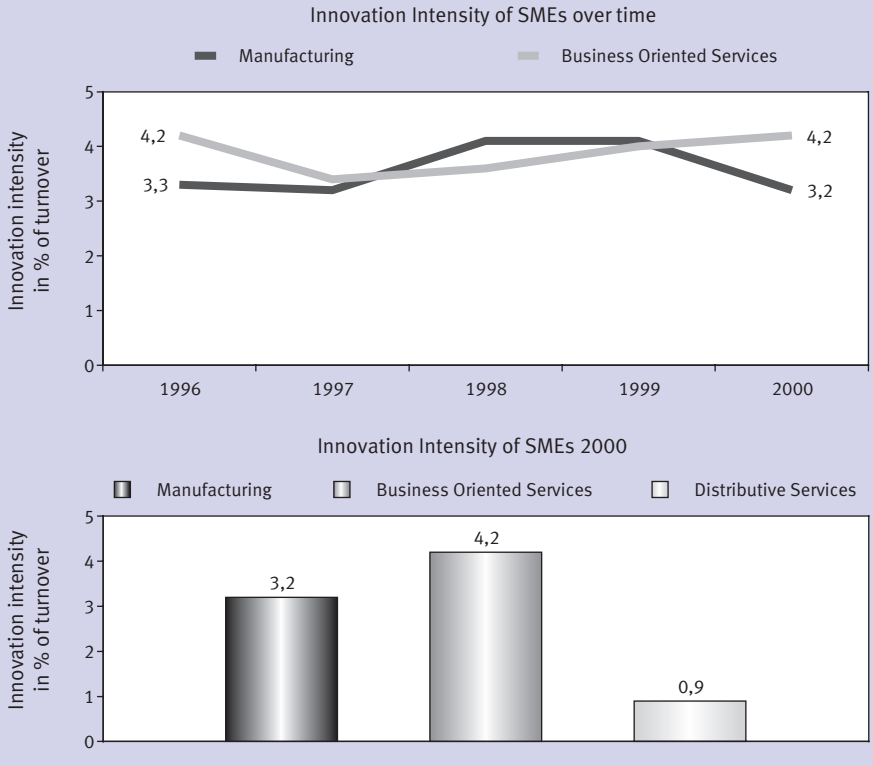

**Source:** ZEW (2002): Mannheim Innovation Panels
**Note:** Values for the service sector only available since 1996. Values for 1999 and 2000 are provisional and for the distributive service sector starting in 2000 only limited comparability with previous years. Figures for 2001 are plans/expectations of the enterprises. All figures expanded for the German statistical population.

## Innovation Intensity 1996 to 2000




**Source:** ZEW (2002): Mannheim Innovation Panels
**Note:** Shares do not include Banks or Insurance. Values for 1999 and 2000 are provisional. All figures expanded for the German statistical population.

## Innovation Intensity of SME 1996 to 2000




**Source:** ZEW (2002): Mannheim Innovation Panels
**Note:** Shares do not include Banks or Insurance. Values for 1999 and 2000 are provisional. All figures expanded for the German statistical population of SMEs.

lue of 84 milliard € in 2001, could once again have reached the same level as in 1999. Positive estimations for 2001 are particularly seen in large enterprises. Due to fiscal reform and strong economic activity in 2000 the overall cash-flow situation has improved. After the implementation delay this improvement should also be seen in innovative expenditure. To what extent this will result in higher innovation budgets in the medium term remains to be seen. Medium term macroeconomic innovation expenditure appears to remain stable.

The trend in innovation expenditure is led in particular by the manufacturing industry, which accounts for around 70% of the overall expenditure in the observed sectors. Here as well, particularly the large enterprises have expanded their innovation budgets while the expenditure by industrial small and medium sized enterprises has receded.

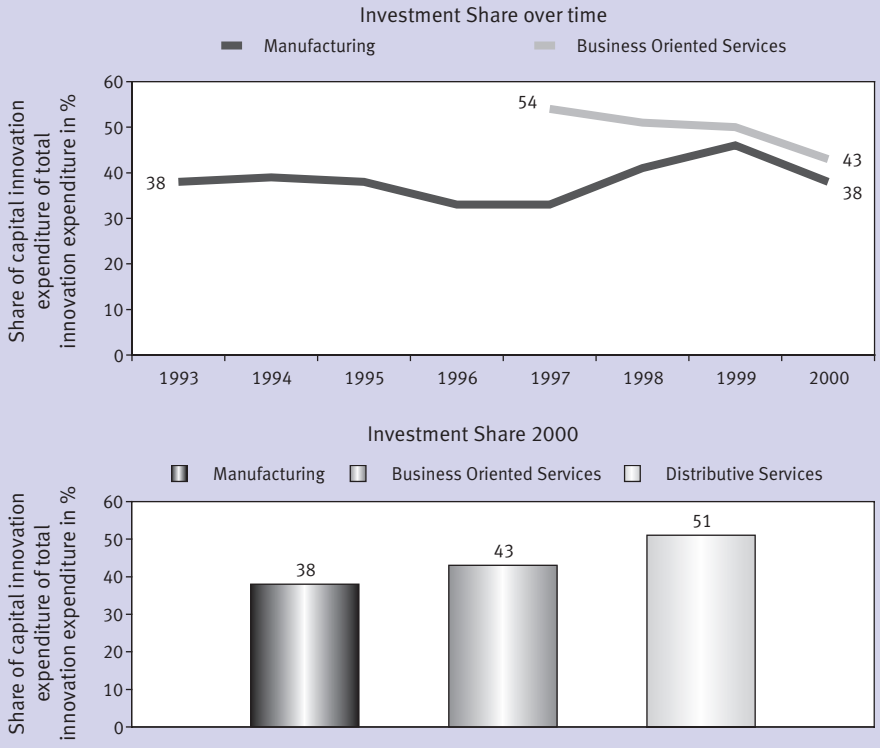
Likewise, the innovation expenditure of the business-oriented service providers also fell, when UMTS spending is ignored. The regression in expenditure (without UMTS) from approximately 16 milliard € to clearly less than 15 milliard € was the first since the innovation surveys started in 1996. The large business oriented service providers have significantly reduced their innovation budgets. They spent 1.6 milliard € or 20% less on innovative activities.

This can essentially be traced back to the banks, whose innovation expenditure had increased sharply over the past years, led primarily by the millennium effect and the introduction of the Euro. These trends have now normalised. Even the large electronic data processing and telecommunication service providers have reduced their inno-

### Innovation Expenditure

Innovation expenditure refers to spending within a given year on ongoing, concluded or abandoned projects. It includes ongoing spending (on personnel or necessary materials or services etc.) and capital innovation expenditure. Which cover internal R&D expenditure, machines and materials, for other external knowledge (e.g. software, patents and licenses, incl. UMTS-licences) and training or further training of staff. It also includes expenditure for the introduction to markets as well as the conception of services and other procedures and preparations for production and distribution.

## Investment Share of Total Innovation Expenditure 1993 to 2000




**Source:** ZEW (2002): Mannheim Innovation Panels
**Note:** Values for service sector available only since 1997. Values for 1999 and 2000 are provisional. All figures expanded for the German statistical population.

## Turnover Share due to Innovative Products

Turnover share due to product innovations refers to turnover in a particular year, which has been achieved through new or significantly improved products or services generated within the previous three years.
Turnover share due to market novelties refers to turnover in a particular year, achieved through market novelties developed within the previous three years. Calculations for business-oriented services do not include banks or insurance.
Due to EUROSTAT guidelines within the scope of the Harmonisation of the Community Innovation Survey (CIS 3), certain questions concerning product innovations have been reformulated in such a way that the results for 2000 can no longer be compared to previous years. This applies mainly to service providers, but also individual sectors of the manufacturing industry. Therefore, the turnover share of product innovations can no longer be compared with previous years.

vation expenditure (without UMTS) by roughly 10%. The UMTS expenditure by large enterprises has displaced other innovation expenditure and has severely constricted decision-making leeway.

In comparison to the large business-oriented service providers, small and medium sized service providers spend a considerably larger share of their turnover on innovation projects. The innovation intensity here, deviates from the general economic trend and despite a sagging innovation share, grew from 4.0% to 4.2%.

The regression in innovation expenditure was accompanied by a regression in the share of capital innovation expenditure as a percentage of total spending. Within the German industry the share of innovation expenditure of turnover decreased from 46% to 38%, for the business-oriented service providers the share dropped to 43% from 50%. The described expansion of continuous R&D activity amongst West-German enterprises is seen primarily in human resources and property expenditure.

The distributive service providers contribute the least to innovation expenditure within the German economy. A mere 12% of innovation expenditure in 2000 was contributed by this group.

## Small decline within industry, Long-term growth in turnover share of market novelties

The frugal use of resources for innovation activities went hand in hand with rather low innovative success, measured as turnover share due to innovative products. The turnover share due to market novelties could not maintain the high levels of 1999, and receded slightly for the first time since 1996. The economy driven expansion in the production and distribution of standard products and services bore heavily on the turnover of innovative products and in particular, the turnover of high cost-of-sales products and those products that require considerable instruction and explanations.

In the manufacturing industry, the turnover share due to market novelties fell to approximately 8%, resulting in roughly a three quarters of a percentage point decrease over 1999, but still lies clearly above the 1990's average. The long-term trend continues to move slowly upwards, thereby maintaining Germany's hold on one of the top positions regarding turnover share due to market novelties when compared on an international level.

The difference between the innovative success of business-oriented service providers and industrial enterprises has clearly become smaller in 2000. With an increase in the turnover share due to market novelties of three quarters of a percent, business-oriented service providers are now only one percentage point behind the manufacturing sector. In comparison, the distributive service providers are far behind. Here, the turnover share due to market novelties is only 3%.

## Cost-cutting effects of process innovations rising in long-term, small regression in the industry

The success of process innovations is harder to measure, because the replacement of production machinery may have several different reasons. Process innovations can for example, have goals such as assuring that products meet new legal requirements, or quality improvements. If process innovations are intended for rationalisation, in terms of reducing average production costs, then the efficiency of process innovations can be measured as the share of cost reductions. After an increase in the previous year, the volume of cost-reduc-

tions has receded slightly in 2000. In the manufacturing industry, not only did the share of enterprises that were able to reduce costs through process innovations decrease, the share of the cost-reduction itselves declined by a half a percentage point to roughly 7%. Particularly amongst small and medium sized enterprises, rationalisation efforts had to be cutback quite significantly. Small and medium sized industrial enterprises could save a solid 4% of costs in 1999 through rationalisation efforts compared to less than 3% in 2000.

However, the share of cost-reduction continues to fluctuate strongly over time. Over the long-term, a light positive trend is expected to continue. The share of cost-reduction still remains almost 3% percentage points above the value for 1994. However, in earlier studies performed by the ZEW, it was discovered that at least in the industry, the relative impact of rationalisation goals within the scope of innovation strategies is regressive, despite a slight rise in the long-term indicators. These results are confirmed through the ifo-Investment-Test. According to this study, the importance of rationalisation motives in making investment decisions within the manufacturing industry has been receding for years.

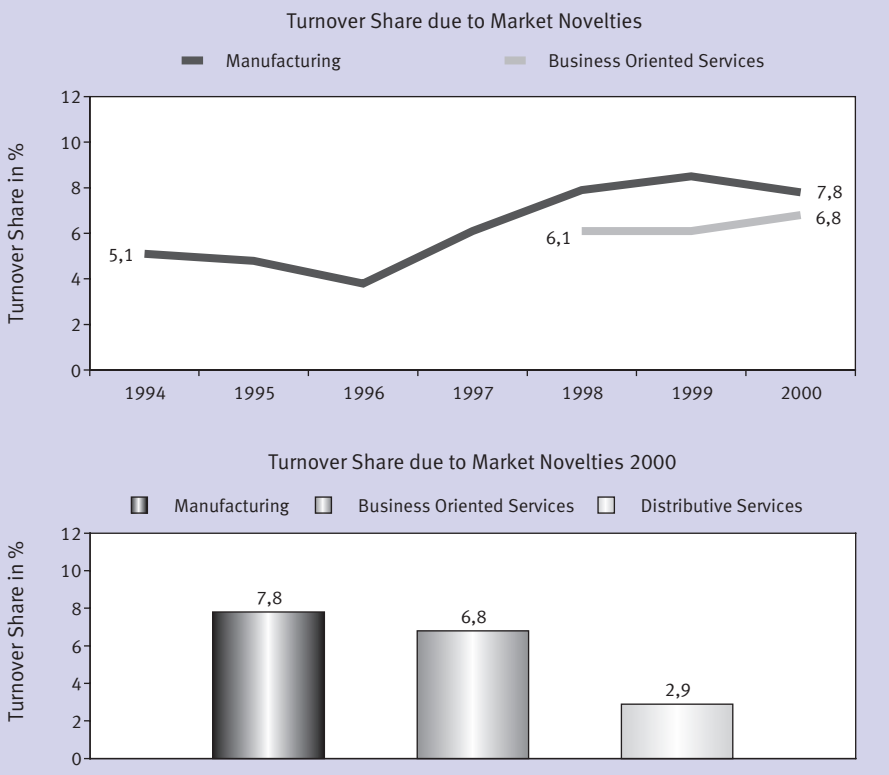
Despite the fact that productivity still lies behind that of the West, the East was clearly not able to realise that same level of cost reductions. Cost-reduction due to process innovations in East-German enterprises was more than a percentage point lower than in the previous year. The lower level of capacity utilisation in the East during the economic recovery period reduces the incentives for East-German enterprises to invest in measures to increase efficiency. This applies to all observed sectors.

The business-oriented service providers in East- and West-Germany are developing in opposite directions. While West-German enterprises were able to reduce costs by 5% (after a solid 4% in 1999), East-German enterprises could barely manage to save 2% (after 3.5% in 1999). In the West, a particularly high rationalisation potential could be realised amongst electronic data processing and telecommunications enterprises. In comparison to the manufacturing industry, it appears that a substantial rationalisation potential still exists in the service sector.

### Share of Cost Reduction due to Process Innovations

Share of cost reduction refers to costs from the previous year which are reduced by cost-reducing process innovations from the preceding three years. The shares are weighted according to turnover and hence calculations for business-oriented services exclude banks and insurance.

### Turnover Share due to Market Novelties 1994 to 2000




**Source:** ZEW (2002): Mannheim Innovation Panels
**Note:** Values for 1999 and 2000 are provisional. Values for manufacturing industry available only since 1994, and only since 1998 for service sector without data for Banking and Insurance. All figures expanded for the German statistical population.

## Lack of qualified labour the central external factor hampering innovation

A ZEW study on the qualified labour shortage and qualification requirements within ICT (Information and Communication Technologies) on behalf of bmb+f, found that a shortage of qualified labour is a much larger problem for smaller enterprises than for larger ones. Not only are innovation projects put on hold or cancelled, even customer orders have to be turned down or in some cases even quotes cannot be delivered. In the short-term, even employee training and education programs cannot rectify this problem because the corresponding qualified personnel is missing.

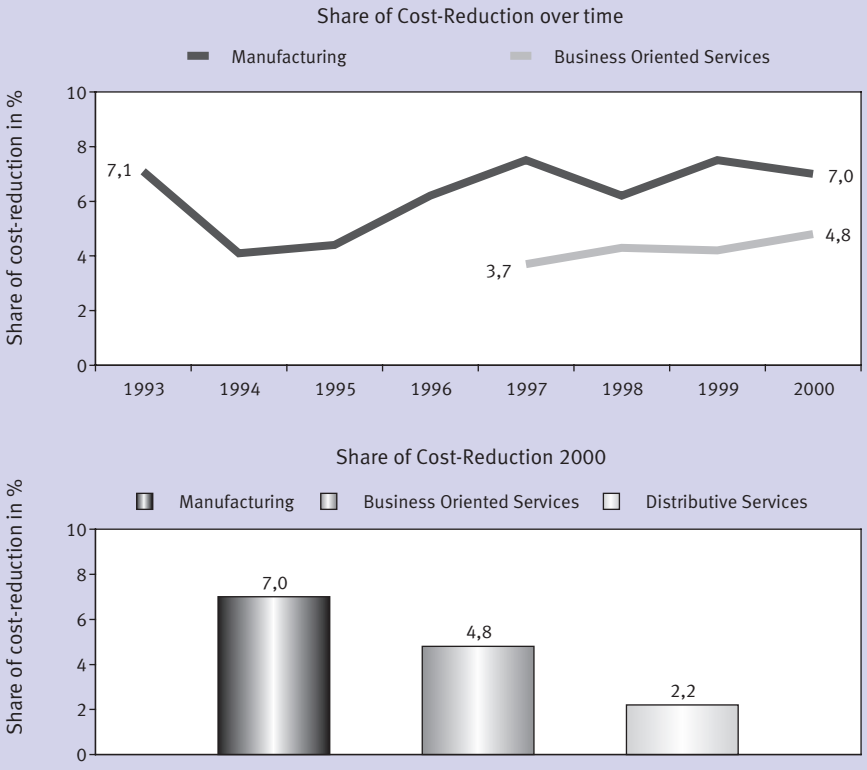
The analyses of the 2001 Survey of the Mannheim Innovation Panels confirms that a lack of qualified labour is the main external factor hampering innovation. One in five innovative enterprises listed the lack of qualified personnel as a very significant factor that restricted innovation activities. In comparison to previous surveys, the relevance of the qualified labour shortage has increased dramatically. Across all observed sectors the lack of qualified labour is now the most significant external and after high innovation costs and risk, the second most significant overall factor hampering innovation. During the mid 1990's, the lack of financial resources was the dominant factor hampering innovation. This has now been surpassed by the lack of qualified labour. However, not only is there a shortage of qualified labour in ICT, according to the recent VDMA Engineering Survey, there is also a shortage of qualified engineers.

Innovation hampering factors, such as a lack of qualified labour as well as financial restrictions affect small enterprises much sooner and more strongly than large enterprises. However, an exception occurs amongst many business-oriented service providers, especially those in the electronic data processing and telecommunications

sectors. Although they are also under immense innovative and competitive pressure, they are able to provide an exceedingly interesting field of activity for the highly-qualified younger generations with good opportunities for advancement and the possibility to enter established enterprises mid-way up the corporate structure. These service providers can even compete with large enterprises when hiring an innovative labour force.

The lack of qualified labour is clearly a larger problem for West-German enterprises as compared to those of East-Germany. This can be traced back to a clearly lower economic growth rate and considerably lower capacity utilisation in East-Germany. There, economic growth was merely 1.1 % with a capacity utilisation of only 83.7 % in 2000, combined with a prolonged rate of high unemployment. Therefore, missing information about technological possibilities and market data play a larger role as factors hampering innovation for East-German enterprises. This results in a lower market acceptance of innovations which in turn has a negative effect on the already poor financing conditions and leads to a concentration on the existing product range and a reduction in innovation activity.

## Cost Reduction through Process Innovations 1993 to 2000




**Source:** ZEW (2002): Mannheim Innovation Panels
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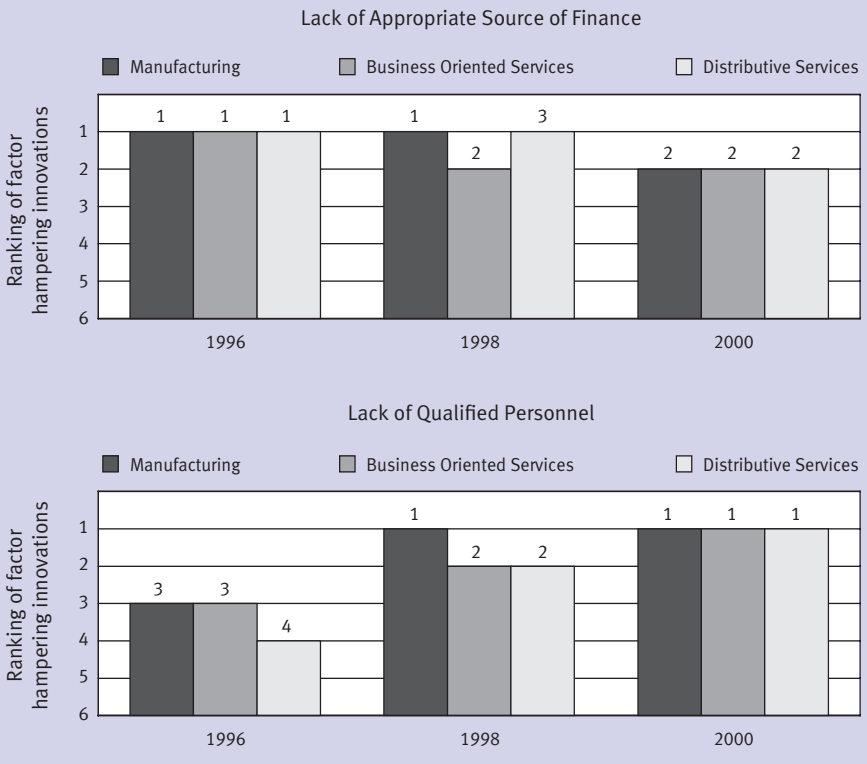
## External Factors Hampering Innovation




Source: ZEW (2002): Mannheim Innovation Panels
Note: Values are provisional. All figures expanded for the German statistical population.

## Key figures of innovation activities in manufacturing and mining – 1993 to 2000

| | 1993 | | | 1994 | | | 1995 | | | 1996 | | | 1997 | | | 1998 | | | 1999 | | | 2000 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* |
| **Enterprises (in Thsd.)** | 70,5 | 100 | | 69,6 | 100 | | 64,8 | 100 | | 62,5 | 100 | | 63,0 | 100 | | 63,1 | 100 | | 63,1 | 100 | | 63,4 | 100 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Innovators | 37,0 | 52 | 100 | 34,5 | 49 | 100 | 36,1 | 56 | 100 | 37,3 | 60 | 100 | 39,4 | 62 | 100 | 41,5 | 66 | 100 | 42,1 | 67 | 100 | 39,3 | 62 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Product Innovators | 32,6 | 46 | 88 | 32,3 | 46 | 94 | 32,8 | 51 | 91 | 34,7 | 55 | 93 | 37,4 | 59 | 95 | 38,7 | 61 | 93 | 39,4 | 62 | 94 | n.a. | | |
| Process Innovators | 32,4 | 46 | 88 | 27,2 | 39 | 79 | 29,6 | 46 | 82 | 29,9 | 48 | 80 | 30,9 | 49 | 78 | 33,8 | 54 | 81 | 32,9 | 52 | 78 | n.a. | | |
| Market Novelties | – | | | 15,3 | 22 | | 16,0 | 25 | | 14,1 | 23 | | 14,9 | 24 | | 19,7 | 31 | | 20,6 | 33 | | 18,5 | 29 | |
| Cost Reduction | 22,8 | 32 | | 17,1 | 25 | | 18,3 | 28 | | 21,5 | 34 | | 21,5 | 34 | | 21,9 | 35 | | 22,7 | 36 | | 15,7 | 25 | |
| Enterprises with continous R&D | 11,6 | 16 | | 12,9 | 18 | | 11,0 | 17 | | 16,0 | 25 | | – | – | – | 12,5 | 20 | | 13,8 | 22 | | 14,5 | 23 | |
| **Employees (in Millions)** | 7,8 | 100 | | 7,3 | 100 | | 7,1 | 100 | | 6,8 | 100 | | 6,8 | 100 | | 6,7 | 100 | | 6,7 | 100 | | 6,7 | 100 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Innovators | 6,3 | 81 | 100 | 5,8 | 79 | 100 | 5,8 | 82 | 100 | 5,7 | 83 | 100 | 5,9 | 87 | 100 | 6,0 | 88 | 100 | 5,9 | 87 | 100 | 5,6 | 83 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Product Innovators | 5,8 | 75 | 92 | 5,5 | 75 | 95 | 5,5 | 78 | 94 | 5,5 | 80 | 96 | 5,7 | 85 | 98 | 5,7 | 85 | 96 | 5,6 | 84 | 96 | n.a. | | |
| Process Innovators | 5,7 | 74 | 91 | 5,1 | 70 | 89 | 5,2 | 73 | 89 | 5,1 | 74 | 89 | 5,4 | 80 | 92 | 5,5 | 81 | 92 | 5,4 | 80 | 91 | n.a. | | |
| Enterprises with continous R&D | 4,5 | 57 | | 4,2 | 58 | | 4,2 | 58 | | 4,3 | 64 | | – | – | – | 4,0 | 60 | | 4,1 | 61 | | 3,8 | 57 | |
| **Innovation Expenditure (in Milliard Euro)** | 48,1 | | 100 | 44,5 | | 100 | 48,6 | | 100 | 52,2 | | 100 | 52,9 | | 100 | 55,7 | | 100 | 58,2 | | 100 | 58,1 | | 100 |
| Share of Turnover in % | | 4,8 | | | 4,2 | | | 4,4 | | | 4,9 | | | 4,5 | | | 4,7 | | | 4,7 | | | 4,4 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Current Innovation Expenditure | 29,7 | | 62 | 27,1 | | 61 | 30,2 | | 62 | 34,8 | | 67 | 35,5 | | 67 | 32,9 | | 59 | 31,4 | | 54 | 35,9 | | 62 |
| Capital Innovation Expenditure | 18,4 | | 38 | 17,4 | | 39 | 18,4 | | 38 | 17,4 | | 33 | 17,4 | | 33 | 22,8 | | 41 | 26,8 | | 46 | 22,1 | | 38 |
| **Share of Turnover due to** | | | | | | | | | | | | | | | | | | | | | | | | |
| *(in %)* | | | | | | | | | | | | | | | | | | | | | | | | |
| Product Novelties | | 38,2 | | | 38,0 | | | 38,7 | | | 36,0 | | | 37,6 | | | 39,3 | | | 43,0 | | | n.a. | |
| Market Novelties | | – | | | 5,1 | | | 4,8 | | | 3,8 | | | 6,1 | | | 7,9 | | | 8,5 | | | 7,8 | |
| **Share of Reduced Costs** | | | | | | | | | | | | | | | | | | | | | | | | |
| *(in %)* | | 7,1 | | | 4,1 | | | 4,4 | | | 6,2 | | | 7,5 | | | 6,2 | | | 7,5 | | | 7,0 | |

Source: ZEW (2002): Mannheim Innovation Panels - manufacturing and mining
Note: Values for 1999 und 2000 provisional. "–": Values not available. "n.a.":Values not declared because a comparison with previous years is not possible.
Turnover share due to product innovations for 1996 to 2000 only to a limited extend comparable with previous years. R&D-data for 1999 is refering to internal and external R&D-activities and thus can be somewhat exagerated.
All information projected to the German statistical population.

## Key figures of innovation activities in business oriented services 1996 - 2000

| | Business oriented services* | | | | | | | | | | For comparison: Distributive Services** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1996 | | 1997 | | 1998 | | 1999 | | 2000 | | 2000 | |
| | absolut | *in%* | absolut | *in%* | absolut | *in%* | absolut | *in%* | absolut | *in%* | absolut | *in%* |
| **Enterprises (in Thsd.)** | 123,4 | 100 | 122,2 | 100 | 122,9 | 100 | 122,5 | 100 | 123,1 | 100 | 222,2 | 100 |
| *of which:* | | | | | | | | | | | | |
| Innovators | 77,0 | 62 100 | 77,6 | 64 100 | 76,3 | 62 100 | 77,3 | 63 100 | 73,6 | 60 | 90,1 | 41 |
| *of which:* | | | | | | | | | | | | |
| Product Innovators | 67,6 | 55 88 | 73,6 | 60 95 | 74,1 | 60 97 | 72,0 | 59 93 | n.a. | | n.a. | |
| Process Innovators | 51,5 | 42 67 | 69,1 | 57 89 | 49,8 | 41 65 | 61,8 | 50 80 | n.a. | | n.a. | |
| Market Novelties | | – | | – | 27,3 | 22 | 25,1 | 20 | 30,1 | 24 | 22,9 | 10 |
| Cost Reduction | | – | 30,0 | 25 | 25,0 | 20 | 20,5 | 17 | 21,4 | 17 | 24,3 | 11 |
| Enterprises with continous R&D | 15,6 | 13 | – | – – | 12,9 | 11 | 14,8 | 12 | 17,6 | 14 | 6,9 | 3 |
| **Innovation Expenditure (in Milliard Euro)** | 11,2 | | 11,2 | | 14,7 | | 15,8 | 100 | 14,6 | | 10,1 | |
| Share of Turnover in % | | 2,9 | | 2,6 | | 2,9 | | 3,0 | | 3,1 | | 0,8 |
| *of which:* | | | | | | | | | | | | |
| Current Innovation Expenditure | – | – | 5,1 | 46 | 7,2 | 49 | 7,9 | 50 | 8,3 | 57 | 5,0 | 49 |
| Capital Innovation Expenditure | – | – | 6,1 | 54 | 7,4 | 51 | 7,9 | 50 | 6,3 | 43 | 5,2 | 51 |
| **Share of turnover due to** *(in %)* | | | | | | | | | | | | |
| Product Novelties | | | | 34,7 | | 31,5 | | 34,2 | | n.a. | | n.a. |
| Market Novelties | | – | | – | | 6,1 | | 6,1 | | 6,8 | | 2,9 |
| **Share of Reduced Costs** *(in %)* | | – | | 3,7 | | 4,3 | | 4,2 | | 4,8 | | 2,2 |

Source: ZEW (2002): Mannheim Innovation Panel - Business oriented services.

Note: Values for 1999 und 2000 provisional. Deviations from totals due to rounding. "-": Values not available. "n.a.":Values not declared because a comparison with previous years is not possible.

Turnover shares and cost-reduction excluding banks and insurance. All information projected to the German statistical population.

* Banking/Insurance, EDP und Telecommunication, Technical Services, Consulting, Advertising, Real Estate/Renting, Sewage and Refuse Disposal, other services close to industry.

** Wholsale and Retail Trade, Transportation and Telecommunication including Postal Services, Real Estate Business and Renting of movable things without service personal.

## Key figures of innovation activities in manufacturing – SME 1993 to 2000

| | 1993 | | | 1994 | | | 1995 | | | 1996 | | | 1997 | | | 1998 | | | 1999 | | | 2000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | *in%* |
| **Enterprises (in Thsd.)** | 68,5 | 100 | | 67,7 | 100 | | 62,8 | 100 | | 60,7 | 100 | | 61,2 | 100 | | 61,3 | 100 | | 61,2 | 100 | | 61,1 | 100 |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | |
| Innovators | 35,2 | 51 | 100 | 32,8 | 48 | 100 | 34,4 | 55 | 100 | 35,7 | 59 | 100 | 37,6 | 62 | 100 | 39,8 | 65 | 100 | 40,4 | 66 | 100 | 37,5 | 61 |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | |
| Product Innovators | 30,9 | 45 | 88 | 30,7 | 45 | 94 | 31,1 | 50 | 90 | 33,1 | 55 | 93 | 35,7 | 58 | 95 | 37,0 | 60 | 93 | 37,7 | 62 | 93 | n.a. | |
| Process Innovators | 30,8 | 45 | 87 | 25,7 | 38 | 78 | 28,0 | 45 | 81 | 28,4 | 47 | 80 | 29,2 | 48 | 78 | 32,2 | 53 | 81 | 31,3 | 51 | 77 | n.a. | |
| Market Novelties | | – | | 14,3 | 21 | | 14,9 | 24 | | 13,0 | 22 | | 13,7 | 22 | | 18,4 | 30 | | 19,4 | 32 | | 17,3 | 28 |
| Cost Reduction | 21,4 | 31 | | 15,8 | 23 | | 17,1 | 27 | | 20,4 | 34 | | 20,0 | 33 | | 20,5 | 34 | | 21,2 | 35 | | 14,5 | 24 |
| Enterprises with continous R&D | 10,3 | 15 | | 11,6 | 17 | | 9,6 | 15 | | 14,6 | 24 | | – | – | – | 11,2 | 18 | | 12,4 | 20 | | 13,2 | 21 |
| **Employees (in Millions)** | 3,6 | 100 | | 3,6 | 100 | | 3,4 | 100 | | 3,3 | 100 | | 3,4 | 100 | | 3,4 | 100 | | 3,4 | 100 | | 3,4 | 100 |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | |
| Innovators | 2,5 | 68 | 100 | 2,4 | 66 | 100 | 2,5 | 72 | 100 | 2,5 | 76 | 100 | 2,6 | 78 | 100 | 2,7 | 80 | 100 | 2,6 | 78 | 100 | 2,4 | 70 |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | |
| Product Innovators | 2,2 | 60 | 88 | 2,2 | 63 | 95 | 2,3 | 66 | 92 | 2,4 | 71 | 93 | 2,5 | 74 | 96 | 2,6 | 76 | 95 | 2,5 | 73 | 94 | n.a. | |
| Process Innovators | 2,1 | 58 | 86 | 2,0 | 55 | 84 | 2,1 | 60 | 83 | 2,1 | 63 | 83 | 2,2 | 66 | 85 | 2,3 | 69 | 86 | 2,2 | 65 | 83 | n.a. | |
| Enterprises with continous R&D | 1,1 | 30 | | 1,2 | 35 | | 1,1 | 32 | | 1,3 | 40 | | – | – | – | 1,2 | 36 | | 1,2 | 36 | | 1,1 | 33 |
| **Innovation Expenditure (in Milliard Euro)** | 17,8 | | 100 | 14,5 | | 100 | 15,8 | | 100 | 14,5 | | 100 | 14,1 | | 100 | 18,5 | | 100 | 19,0 | | 100 | 15,5 | 100 |
| Share of Turnover in % | | 4,3 | | | 3,3 | | | 3,7 | | | 3,3 | | | 3,2 | | | 4,1 | | | 4,1 | | | 3,2 |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | |
| Current Innovation Expenditure | 7,8 | | 44 | 6,8 | | 47 | 7,5 | | 47 | 7,7 | | 53 | 7,1 | | 51 | 8,3 | | 45 | 9,2 | | 48 | 7,2 | 47 |
| Capital Innovation Expenditure | 10,0 | | 56 | 7,8 | | 53 | 8,3 | | 53 | 6,8 | | 47 | 6,9 | | 49 | 10,2 | | 55 | 9,8 | | 52 | 8,2 | 53 |
| **Share of Turnover due to** | | | | | | | | | | | | | | | | | | | | | | | |
| *(in %)* | | | | | | | | | | | | | | | | | | | | | | | |
| Product Novelties | | 28,9 | | | 30,9 | | | 32,3 | | | 30,3 | | | 28,9 | | | 31,4 | | | 30,3 | | | n.a. |
| Market Novelties | | – | | | 3,7 | | | 3,6 | | | 3,7 | | | 4,1 | | | 5,7 | | | 5,7 | | | 5,0 |
| **Share of Reduced Costs** | | | | | | | | | | | | | | | | | | | | | | | |
| *(in %)* | | 4,6 | | | 3,6 | | | 3,6 | | | 4,7 | | | 4,3 | | | 4,2 | | | 4,2 | | | 2,7 |

Source: ZEW (2002): Mannheim Innovation Panels - manufacturing and mining
Note: Values for 1999 und 2000 provisional. "–": Values not available. "n.a.":Values not declared because a comparison with previous years is not possible.
Turnover share due to product innovations for 1996 to 2000 only to a limited extend comparable with previous years. All information projected to the German statistical population.

## Key figures of innovation activities in business oriented services - SME 1996 to 2000

| | Business oriented services* | | | | | | | | | | For comparison: Distributive Services** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1996 | | 1997 | | 1998 | | 1999 | | 2000 | | 2000 | |
| | absolut | *in%* | absolut | *in%* | absolut | *in%* | absolut | *in%* | absolut | *in%* | absolut | *in%* |
| **Enterprises (in Thsd.)** | 121,9 | 100 | 120,7 | 100 | 121,4 | 100 | 121,0 | 100 | 121,6 | 100 | 221,1 | 100 |
| *of which:* | | | | | | | | | | | | |
| Innovators | 75,7 | 62 100 | 76,3 | 63 100 | 75,0 | 62 100 | 76,0 | 63 100 | 72,4 | 60 | 89,4 | 40 |
| *of which:* | | | | | | | | | | | | |
| Product Innovators | 66,4 | 54 88 | 72,3 | 60 95 | 72,8 | 60 97 | 70,7 | 58 93 | n.a. | | n.a. | |
| Process Innovators | 50,3 | 41 67 | 67,9 | 56 89 | 48,7 | 40 65 | 60,6 | 50 80 | n.a. | | n.a. | |
| Market Novelties | | – | | – | 26,5 | 22 | 24,4 | 20 | 29,4 | 24 | 22,6 | 10 |
| Cost Reduction | | – | 29,5 | 24 | 24,4 | 20 | 19,8 | 16 | 20,8 | 17 | 23,9 | 11 |
| Enterprises with continous R&D | 15,2 | 12 | – | – – | 12,4 | 10 | 14,3 | 12 | 17,0 | 14 | 6,5 | 3 |
| **Innovation Expenditure (in Milliard Euro)** | 6,5 | | 6,0 | | 6,7 | | 6,9 | | 7,3 | | 5,3 | |
| Share of Turnover in % | | 4,2 | | 3,4 | | 3,6 | | 4,0 | | 4,2 | | 0,9 |
| *of which:* | | | | | | | | | | | | |
| Current Innovation Expenditure | – | – | 2,8 | 47 | 3,5 | 53 | 3,2 | 47 | 3,9 | 53 | 2,4 | 45 |
| Capital Innovation Expenditure | – | – | 3,1 | 53 | 3,1 | 47 | 3,7 | 53 | 3,4 | 47 | 2,9 | 55 |
| **Share of turnover due to** *(in %)* | | | | | | | | | | | | |
| Product Novelties | | | | 32,0 | | 25,7 | | 24,2 | | n.a. | | n.a. |
| Market Novelties | | – | | – | | 3,9 | | 4,4 | | 4,8 | | 3,5 |
| **Share of Reduced Costs** *(in %)* | | – | | 4,1 | | 3,0 | | 2,1 | | 3,0 | | 1,6 |

Source: ZEW (2002): Mannheim Innovation Panel - Business oriented services.

Note: Values for 1999 und 2000 provisional. Deviations from totals due to rounding. "-": Values not available. "n.a.": Values not declared because a comparison with previous years is not possible.

Turnover shares and cost-reduction excluding banks and insurance. All information projected to the German statistical population.

* Banking/Insurance, EDP und Telecommunication, Technical Services, Consulting, Advertising, Real Estate/Renting, Sewage and Refuse Disposal, other services close to industry.

** Wholsale and Retail Trade, Transportation and Telecommunication including Postal Services, Real Estate Business and Renting of movable things without service personal.

## Key figures of innovation activities in manufacturing – East Germany 1993 to 2000

| | 1993 | | | 1994 | | | 1995 | | | 1996 | | | 1997 | | | 1998 | | | 1999 | | | 2000 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* | absolut | | *in%* |
| **Enterprises (in Thsd.)** | 7,7 | 100 | | 8,5 | 100 | | 7,9 | 100 | | 7,9 | 100 | | 8,4 | 100 | | 8,9 | 100 | | 9,4 | 100 | | 9,9 | 100 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Innovators | 5,2 | 67 | 100 | 4,9 | 58 | 100 | 4,8 | 60 | 100 | 5,0 | 63 | 100 | 5,3 | 64 | 100 | 6,1 | 68 | 100 | 6,3 | 67 | 100 | 6,1 | 61 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Product Innovators | 4,7 | 61 | 92 | 4,7 | 55 | 95 | 4,4 | 56 | 93 | 4,8 | 61 | 96 | 5,0 | 60 | 95 | 5,6 | 63 | 93 | 6,1 | 64 | 96 | n.a. | | |
| Process Innovators | 4,4 | 56 | 84 | 4,1 | 48 | 83 | 4,0 | 51 | 84 | 3,8 | 48 | 76 | 4,2 | 50 | 78 | 4,7 | 53 | 78 | 5,1 | 54 | 81 | n.a. | | |
| Market Novelties | | – | | 1,8 | 22 | | 1,9 | 24 | | 1,6 | 21 | | 1,8 | 21 | | 2,5 | 28 | | 2,8 | 30 | | 2,7 | 27 | |
| Cost Reduction | 3,0 | 39 | | 2,7 | 32 | | 2,7 | 34 | | 2,9 | 37 | | 2,7 | 32 | | 3,0 | 33 | | 3,2 | 34 | | 2,1 | 22 | |
| Enterprises with continous R&D | 2,0 | 26 | | 2,5 | 30 | | 1,8 | 22 | | 2,2 | 28 | | – | – | – | 2,4 | 27 | | 2,9 | 31 | | 2,6 | 26 | |
| **Employees (in Thsd.)** | 696 | 100 | | 630 | 100 | | 562 | 100 | | 542 | 100 | | 550 | 100 | | 562 | 100 | | 573 | 100 | | 596 | 100 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Innovators | 498 | 72 | 100 | 463 | 73 | 100 | 399 | 71 | 100 | 415 | 77 | 100 | 435 | 79 | 100 | 448 | 80 | 100 | 465 | 81 | 100 | 452 | 76 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Product Innovators | 437 | 63 | 88 | 404 | 64 | 87 | 316 | 56 | 79 | 402 | 74 | 97 | 416 | 76 | 95 | 424 | 75 | 95 | 433 | 76 | 93 | n.a. | | |
| Process Innovators | 411 | 59 | 83 | 377 | 60 | 81 | 286 | 51 | 72 | 319 | 29 | 77 | 380 | 69 | 87 | 396 | 71 | 88 | 411 | 72 | 88 | n.a. | | |
| Enterprises with continous R&D | 281 | 40 | | 285 | 45 | | 237 | 42 | | 256 | 47 | | – | – | – | 265 | 47 | | 267 | 47 | | 232 | 39 | |
| **Innovation Expenditure (in Milliard Euro)** | 3,7 | | 100 | 3,6 | | 100 | 2,8 | | 100 | 2,8 | | 100 | 2,9 | | 100 | 3,9 | | 100 | 3,6 | | 100 | 3,7 | | 100 |
| Share of Turnover in % | | 7,4 | | | 6,2 | | | 4,6 | | | 4,7 | | | 4,4 | | | 5,3 | | | 4,7 | | | 4,2 | |
| *of which:* | | | | | | | | | | | | | | | | | | | | | | | | |
| Current Innovation Expenditure | 1,5 | | 40 | 1,4 | | 39 | 1,1 | | 39 | 1,2 | | 42 | 1,1 | | 37 | 1,8 | | 46 | 1,6 | | 44 | 1,6 | | 44 |
| Capital Innovation Expenditure | 2,2 | | 60 | 2,2 | | 61 | 1,7 | | 61 | 1,6 | | 58 | 1,8 | | 63 | 2,1 | | 54 | 2,0 | | 56 | 2,1 | | 56 |
| **Share of Turnover due to** | | | | | | | | | | | | | | | | | | | | | | | | |
| *(in %)* | | | | | | | | | | | | | | | | | | | | | | | | |
| Product Novelties | | 37,1 | | | 35,4 | | | 30,9 | | | 32,4 | | | 34,0 | | | 39,0 | | | 35,3 | | | n.a. | |
| Market Novelties | | – | | | 3,2 | | | 2,0 | | | 2,8 | | | 3,8 | | | 6,9 | | | 6,9 | | | 7,0 | |
| **Share of Reduced Costs** *(in %)* | | 6,0 | | | 6,3 | | | 4,5 | | | 4,6 | | | 5,5 | | | 4,3 | | | 4,5 | | | 3,0 | |

Source: ZEW (2002): Mannheim Innovation Panels - manufacturing and mining
Note: Values for 1999 und 2000 provisional. "–": Values not available. "n.a.":Values not declared because a comparison with previous years is not possible.
Turnover share due to product innovations for 1996 to 2000 only to a limited extend comparable with previous years. R&D-data for 1999 is refering to internal and external R&D-activities and thus can be somewhat exagerated.
All information projected to the German statistical population.

## Key figures of innovation activities in business oriented services - East Germany 1996 to 2000

| | Business oriented services* | | | | | | | | | | For comparison: Distributive Services** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1996 | | | 1997 | | | 1998 | | 1999 | | 2000 | | 2000 | |
| | absolut | *in%* | | absolut | *in%* | | absolut | *in%* | absolut | *in%* | absolut | *in%* | absolut | *in%* |
| **Enterprises (in Thsd.)** | 19,4 | 100 | | 18,9 | 100 | | 19,2 | 100 | 19,5 | 100 | 19,8 | 100 | 38,4 | 100 |
| *of which:* | | | | | | | | | | | | | | |
| Innovators | 11,3 | 58 | 100 | 10,8 | 57 | 100 | 11,2 | 58 100 | 12,0 | 61 100 | 11,8 | 59 | 16,1 | 42 |
| *of which:* | | | | | | | | | | | | | | |
| Product Innovators | 8,9 | 46 | 79 | 10,7 | 56 | 99 | 10,3 | 54 92 | 10,7 | 55 89 | n.a. | | n.a. | |
| Process Innovators | 8,9 | 46 | 79 | 9,8 | 52 | 91 | 8,7 | 45 78 | 10,2 | 52 85 | n.a. | | n.a. | |
| Market Novelties | | – | | | – | | 2,4 | 12 | 3,5 | 18 | 4,9 | 25 | 4,0 | 10 |
| Cost Reduction | | – | | 5,3 | 28 | | 4,2 | 22 | 3,5 | 18 | 3,2 | 16 | 2,8 | 7 |
| Enterprises with continous R&D | 2,4 | 12 | | – | – | – | 2,3 | 12 | 2,3 | 12 | 2,7 | 13 | 1,3 | 3 |
| **Innovation Expenditure (in Milliard Euro)** | 1,3 | | | 1,1 | | | 1,1 | | 1,0 | | 0,8 | | 1,2 | |
| Share of Turnover in % | | 4,7 | | | 3,5 | | | 3,5 | | 3,3 | | 2,8 | | 1,2 |
| *of which:* | | | | | | | | | | | | | | |
| Current Innovation Expenditure | – | – | | 0,6 | 58 | | 0,5 | 47 | 0,5 | 52 | 0,5 | 58 | 0,6 | 51 |
| Capital Innovation Expenditure | – | – | | 0,4 | 42 | | 0,6 | 53 | 0,5 | 48 | 0,3 | 42 | 0,6 | 49 |
| **Share of Turnover due to** *(in %)* | | | | | | | | | | | | | | |
| Product Novelties | | | | | 24,7 | | | 20,6 | | 22,9 | | n.a. | | n.a. |
| Market Novelties | | – | | | – | | | 2,2 | | 3,7 | | 3,9 | | 2,6 |
| **Share of Reduced Costs** *(in %)* | | – | | | 3,6 | | | 2,2 | | 3,6 | | 2,3 | | 1,4 |

Source: ZEW (2002): Mannheim Innovation Panel - Business oriented services.

Note: Values for 1999 und 2000 provisional. Deviations from totals due to rounding. "–": Values not available. "n.a.":Values not declared because a comparison with previous years is not possible.

Turnover shares and cost-reduction excluding banks and insurance. All information projected to the German statistical population.

* Banking/Insurance, EDP und Telecommunication, Technical Services, Consulting, Advertising, Real Estate/Renting, Sewage and Refuse Disposal, other services close to industry.

** Wholsale and Retail Trade, Transportation and Telecommunication including postal services, real estate business and renting of movable things without service personal.

## The Mannheim innovation Panels (ZEW)

Since 1993 the ZEW has, on the behalf of bmb+f, worked in conjunction with infas (Institute for applied social sciences) to gather information on innovative behaviour within the German economy. The information refers to all German enterprises with at least five employees from the manufacturing and mining as well as the distributive and business-oriented services sectors. The term business-oriented services covers banking, insurance, EDP (electronic data processing), telecommunications, technical services, consultancy and other services close to industry. Trade, transport services, real-estate, housing and rental are also known as distributive services.

The stratified sample taken in 2001 covers approximately 22,600 enterprises, which are categorised according to sector, enterprise size and region (East- and West-Germany). The sampling frame used comes from data on enterprises previously prepared by CREDITREFORM.

The postal survey was conducted from March to September 2001, with some 4,700 enterprises participating in the survey. To correct any possible discrepancies in the answers, a further 4,000 enterprises were chosen at random from those which had not already responded in the survey and were questioned over the telephone about key survey factors.

The results are expanded for the entire German statistical population. The values for figures relating to the number of enterprises, employment and turnover between 1993 and 1999 are based on publications by the German Federal Department of Statistics (DESTATIS). For 2000 the figures come from ZEW expansions and are hence provisional.

Due to large gaps in the official statistics, the population for the service sector from 1995 to 1998 was constructed using figures from the Federal Department of Statistics, the German Central Bank as well as various federal supervisory boards and associations. The figures for 1999 and 2000 are partly based on expansions for this population by the ZEW and therefore are provisional. The structure of size classes within the service sector is largely based on ZEW estimations.

The changes in the answering behaviour of the enterprises as a result of the European harmonisation of the survey has led to a change in the service provider sector. Real-estate, housing, and rental have been outsourced from other provided services (mostly for enterprises) and thereby also from business-oriented services and assigned to distributive service providers. For the newly defined business-oriented service providers, consistent time series have been calculated back to 1996. For the newly defined distributive service sector, no consistent time series could be ascertained. Therefore, only the values for 2000 will be declared.

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