MAIN RESULTS

South African Innovation Survey
Main Results 2008

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MAIN RESULTS OF THE SOUTH AFRICAN INNOVATION SURVEY 2008

Reference period 2005 – 2007

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List of Abbreviations and Acronyms

ASTII	African Science, Technology and Innovation Indicators Initiative
CEO	Chief Executive Officer
BEE	Black Economic Empowerment
CeSTII	Centre for Science, Technology and Innovation Indicators
CIS	Community Innovation Survey
CIS 2006	Fifth Round of the Community Innovation Survey
DST	Department of Science and Technology
EU	European Union
EU-27	Expanded European union (27 countries)
FRD	Foundation for Research Development
HSRC	Human Sciences Research Council
IPR	Intellectual Property Rights
ISP	Industrial Strategy Project
MP	Member of Parliament
NACI	National Advisory Council on Innovation
NESTI	National Experts on Science and Technology Indicators
NRF	National Research Foundation
NSI	National System of Innovation
OECD	Organisation for Economic Co-operation and Development
PHHSI	Population Health, Health Systems and Innovation
R&D	Research and Experimental Development
S&T	Science and Technology
SIC	Standard Industrial Classification
SPII	Support Programme for Industrial Innovation
THRIP	Technology and Human Resources for Industry Programme

Country Codes

AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech-Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
EU-27	European Union average (27 countries)
FI	Finland
FR	France
GR	Greece
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SA	South Africa
SE	Sweden
SI	Slovenia
SK	Slovakia
TR	Turkey
UK	United Kingdom

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EXECUTIVE SUMMARY

BACKGROUND AND INTRODUCTION

This report presents the main findings of the South African Innovation Survey 2008, covering the period 2005 – 2007. It presents key indicators describing the activities and patterns of innovation in the business sector in South Africa, including resources and investment provided for innovation in enterprises; the types of innovation activities carried out; the level of novelty of innovations (new to an enterprise, new to the market and or new to the country); sources of information for innovation; and factors hampering or influencing innovation. The report also covers a number of other variables and factors that provide insight into innovation processes in South Africa and is meant to inform the development of innovation policy.

The Centre for Science, Technology and Innovation Indicators (CeSTII) was commissioned by the Department of Science and Technology (DST) to conduct an official series of South African Innovation Surveys as part of the DST's effort to establish a baseline set of science and technology (S&T) indicators for monitoring, reporting on and fine-tuning the National System of Innovation (NSI) in support of South Africa's National Research and Experimental Development (R&D) Strategy and the Ten-year Innovation Plan (2008 – 2018).

Methodology

The South African Innovation Survey 2008 was based on the guidelines of the Organisation for Economic Co-operation and Development's (OECD) *Oslo Manual* (OECD 2005) and more specifically the methodological recommendations for round five of the Community Innovation Survey (CIS 2006) for European Union (EU) countries as provided by Eurostat, the Statistical Office of the European Commission. Using these guidelines enabled the production of indicators that were both relevant for South Africa and internationally comparable.

The survey design was also informed by the structure of the Business Register of Statistics South Africa (Stats SA), which was used to draw a suitable stratified random sample for the survey. The sample frame from which the original sample was drawn had 30 Standard Industrial Classification (SIC) codes and four size classes, which gave a total of 120 strata.

The survey achieved an overall response rate of 26.6% from a sample of 2 836 enterprises. This was lower than the response rate of 37.3% obtained in the 2005 survey, but compares favourably with two previous innovation surveys undertaken in South Africa in which the response rates were less than 10%. A non-response survey was conducted, the results of which were subsequently used to adjust the weights of the strata for bias in the estimation of innovation rate that might arise from a low response rate. The results of the survey were extrapolated to the target business population of 22 849 enterprises by applying the weights of 108 realised sample strata based on SIC codes and four size classes (determined on the basis of annual turnover) used at Stats SA in 2007.

Results

The results of the Innovation Survey 2008 indicate that 65.4% of South African enterprises were engaged in innovation activities. However, the apparent increase (13.7 percentage points) in the proportion of innovating firms in 2008, when compared with the results of the 2005 innovation survey (51.7%), was not significant at the 95% level of significance.

Four types of innovations are recognised in terms of the methodology used in this survey, namely product, process, marketing and organisational innovations. Relatively few enterprises had process only (10.3%) or product only (8.9%) innovations. Enterprises that had both product and process innovations constituted 7.9%. The other 38.2% of enterprises had abandoned only (1.0%) or ongoing innovation activities only (33.7%), or had both abandoned and ongoing innovation activities (3.5%). Technological innovations (product and/or process) thus totalled 65.4%. In terms of non-technological innovations, 51.2% of enterprises had organisational innovations and 27.1% had marketing innovations.

The South African rate of technological innovation compares favourably with the EU average of 39%. The proportion of EU enterprises engaged in innovation activities ranged from 16% in Latvia to 63% in Germany. It should be noted that in order to be regarded as innovative, an enterprise only needs to introduce a product or process that is new to the enterprise itself, although not necessarily new to the market.

The total turnover of the enterprises covered by the survey for 2007 was recorded as R3 311.2 billion. About 85.3% of this turnover was accounted for by enterprises with innovation activities. About 92.3% of total employees of the enterprises included in the survey were accounted for by enterprises that had innovative activities. Innovative enterprises were also found to be more export-oriented than non-innovative enterprises.

About 48.2% of the innovative South African enterprises introduced new or significantly improved products to the market in which they operated. Approximately 8.5% of the turnover of product innovators in 2007 was generated from the sale of products that were new to the market, representing a turnover of about R209.5 billion. A further 6.5% (or R160.5 billion) of turnover was generated by the sale of products that were new to the enterprise concerned but not new to the market. When ranked alongside 23 selected European countries, South Africa was sixth with respect to the proportion of firms introducing products that were new to their respective markets.

Of the 14 934 innovative enterprises, 76.0% reported that their product innovations originated in South Africa and only 24.0% reported that their innovations were developed mainly abroad. This is in line with the findings of the 2005 innovation survey.

Innovative enterprises spent approximately R56.9 billion on innovation activities, which represented about 1.7% of the turnover of all enterprises. In both the industrial and services sectors, the bulk of innovation expenditure (59.6%) was spent on the acquisition of new machinery, equipment and software; 32.6% on in-house and outsourced R&D; and the remaining 7.8% on the acquisition of other external knowledge. In terms of activities undertaken in relation to innovation, 65.7% of enterprises indicated that they had acquired new machinery, equipment and software, and 45.1% conducted in-house R&D. About 20% of the innovative enterprises indicated that they performed R&D on a continuous basis.

Altogether about 4.1% of all innovative enterprises received public funding for their innovation activities between 2005 and 2007. Interrelated with this finding, enterprises identified the cost and financing of innovation as the most important factors hampering innovation. While approximately 42% of all innovative enterprises rated sources of information within the enterprise as 'highly important' for innovation activities, clients and customers were rated as 'highly important' by 41.2% of innovative enterprises, followed by suppliers (21.3%), conferences and trade forums' (13.3%) and competitors (11.4%). Universities and Technikons* were rated as 'highly important' by only 2.1% of enterprises, and government and public research institutes by only 1.5% of enterprises. With respect to 'highly important' sources of information for innovation, South Africa's profile appeared to be similar to the average profile for EU countries.

In private sector enterprises in South Africa, as in Europe, the percentages of co-operation partnerships for innovation with consultants, commercial labs and R&D institutes (15.3%), universities(12.1%) and public research institutes were higher than the corresponding scores for these potential partners as sources of information (respectively 4.6%, 2.1% and 1.5%). These findings could support the view that innovating firms tend to use different strategies for obtaining information for innovation and for locating strategic partners for innovation activities.

Increasing the range of goods and services was an important outcome for 31.2% of innovative enterprises. About 30.7% of innovative enterprises cited improved quality of goods or services as a 'highly important' outcome of innovation; increased capacity of production or service provision was cited as the most important effect of process innovation by 25.6% of innovative enterprises, followed by improved flexibility of production or service provision (15.8%). Other 'highly important' outcomes of innovation were the meeting of government regulatory requirements (15.7% of innovators) and reduced materials and energy per unit output (11.5%).

With regard to intellectual property rights (IPR), innovative enterprises seemed to make use of IPR more often than non-innovative enterprises. Relatively few innovative South African enterprises applied for patents (2.3%) or registered industrial designs (4.3%), compared with registering trademarks (11.3%) and claiming copyright (5.1%). Overall, South Africa had a relatively low intensity of patents compared with more advanced economies.

Conclusions and recommendations

The Innovation Survey 2008 is South Africa's second innovation survey based on a stratified random sample from the official Business Register of Stats SA. Several conclusions and policy recommendations that were published in the report on the Innovation Survey 2005 are still applicable to the 2008 survey.

Although the survey was implemented successfully, due care needs to be taken in arriving at policy conclusions based solely on the results of the two innovation surveys in 2005 and 2008 without observing the broader trends in the economy. Despite the survey's low response rate, the survey findings are useful in understanding the relative innovation performance and impact on various policies in different settings. Similarly, the micro-data analyses that are possible using these data may reveal salient issues relating to innovation performance in South Africa and afford international comparisons.

Despite the best intentions of governments to stimulate innovation through funding, public funds do not appear to have much penetration into the activities of innovative enterprises in South Africa. This could be a result of innovations being part of successful enterprises' business activities; for instance, competitive enterprises are not keen to seek public funds because this would disclose strategic information to others. By comparison, enterprises appear to be more open about engaging in publicly funded R&D where the application of activities is less clear to those outside the business. Perhaps current public funding programmes for innovation in South Africa could be intensified, better publicised and aimed at establishing more trusting relationships between the funders and performers of innovation activities.

*Now known as Universities of Technology

Business and government need to be made aware of the tangible benefits of innovation in order to further encourage innovation. Expenditure on innovation activities inevitably results in sales of new and improved products by enterprises. Enterprises invested some R56.9 billion in innovation in 2007. The investment in innovation activities resulted in sales worth R209.5 billion of products that were new to the market and sales worth R160.5 billion of products that were new to the enterprises concerned. These returns are even more pronounced when the intangible benefits of process or organisational innovations are taken into account.

The closeness of the estimate of intramural expenditure on R&D worth R12.1 billion obtained in the innovation survey, compared with R&D expenditure worth R10.7 billion in the business sector found in the 2007/08 R&D Survey, is encouraging and indicates that South Africa has informative and reliable surveys on both these factors of international competitiveness. This similarity indicates that South Africa can potentially share lessons and learn much from experiences related to policies and instruments for supporting innovation with other regions of the world.

CHAPTER 1

BACKGROUND AND INTRODUCTION

This report presents the main findings of the South African Innovation Survey 2008, covering the period 2005 – 2007.

Innovation has been identified as a key driver of long-term economic growth, competitiveness and better quality of life. With the implementation of innovation, we expect job creation and increased incomes resulting from the production of new products, processes and services and the development of new industries. By adopting newer, more advanced technologies and practices, industries can increase their production capabilities, improve their productivity, and expand their lines of new products and services.

Innovation can be a confusing term unless put into context (Box 1; Box 2). The sorts of innovations that are usually associated with scientific and technological progress and development tend to be those of the more dramatic kind, for instance a new type of machine or a completely new gadget to the market. While national innovation surveys certainly take account of such innovations that are new to the country or new to the world, the more common types of innovations developed by enterprises in the industrial and services sectors tend to be incremental innovations where changed or improved versions of products or processes are introduced to the market. Innovations comprise several types of activities and expenditures, including intramural and extramural (or outsourced) R&D; acquisition of machinery, equipment and software; acquisition of other external knowledge and know-how; training; market introductions and other activities (including significant design changes). The defining element for these various activities to be classified as innovation activities is that they result in improved products or services being introduced to the market. These activities are called technological innovations.

There is a second group of innovation activities, the non-technological innovations, comprising organisational and marketing innovations. Organisational innovations are new or significant changes to firm structure or management methods, while marketing innovations include the implementation of new or significantly improved designs or sales methods. The two different types of innovations (technological and non-technological) are normally reported separately, since a combination of the two tends to result in a very high innovation rate (often close to 100%), which makes international or sectoral comparisons less meaningful.

There are four broad levels of novelty of innovations that are defined in relation to the firm and the market. In levels of increasing novelty, these are:

1. Innovations that are only new to the firm.
2. Innovations that are new to the market of the firm (and its competitors).
3. Innovations that are new to South Africa.
4. Innovations that are a world first.

Innovation in the private sector is very important in boosting growth in the economy and contributing to the quality of life. While some innovation is directly based on the results of R&D, much innovation by the enterprises concerned is based on non-R&D activities aimed at producing new or improved products and/or processes. These non-R&D activities include the acquisition of external knowledge or new equipment and machinery. Unlike earlier innovation surveys (CIS 1 and CIS 2), which tended to be confined to technological innovations, the most recent surveys look at product innovations (both goods and services), process innovations, organisational innovations and marketing innovations.

As in other countries, there are several public programmes and support programmes for R&D and innovation in place in South Africa with the aim of stimulating the development of high-level human resources, as well as research outputs and innovations, which will in turn grow and diversify the economy. Among other issues, the innovation survey not only looks at how many firms benefit from public programmes of support for R&D and innovation, but it also measures innovation activities in small firms and industry sectors that do not normally access such support.

BOX 1: Definitions of innovation, based on the Core CIS 4 questionnaire

A product innovation is the introduction to the market of a new product or service or a significantly improved product or service with respect to its capabilities, such as improved user-friendliness, components or sub-systems.

A process innovation is the use of new or significantly improved methods for the production or supply of products and services.

The innovation (new or improved) must be new to the enterprise, but it does not need to be new to the industry sector or market.

In this survey, distinctions are made between product innovations that are only new to the firm and those that are new to the market of the enterprise.

BOX 2: Previous innovation surveys in South Africa

There have been three previous innovation surveys in South Africa. The first was carried out by the Foundation for Research Development (FRD) and the Industrial Strategy Project (ISP) for the years 1992 – 1994. It was published in October 1997 (Blankley and Kaplan 1997). This survey only covered the manufacturing sector and was based on the first Community Innovation Survey (now referred to as CIS 1). A total of 2 732 questionnaires were distributed and 244 completed questionnaires were received, giving a response rate of 8.9%. This survey was aimed at covering innovating enterprises (to link up with the R&D survey) and was a pilot project on a very limited budget.

The second survey was undertaken by the University of Pretoria and the Eindhoven University of Technology (Netherlands) for the years 1998 – 2000 and covered the manufacturing and services sectors (Oerlemans, Pretorius, Buys and Brooks 2004). Questionnaires were distributed to 7 039 enterprises and 617 (8.4%) completed questionnaires were returned.

Both these surveys relied on commercially available address databases for their sampling design.

The third survey was undertaken by CeSTII on behalf of the DST. This survey was aligned with the CIS 4 and covered the years 2002 – 2004, with quantitative data for 2004. The sample size was 3 087 firms from a stratified random sample extracted from the South African Business Register of Statistics South Africa (Stats SA), and the response rate was 37.3%. The results indicated that 51.7% of South African enterprises were engaged in innovation activities between 2002 and 2004.

CHAPTER 2

METHODOLOGY

2.1 Introduction

The South African Innovation Survey 2008 was based on the guidelines of the Organisation for Economic Co-operation and Development's (OECD) *Oslo Manual* (OECD 2005) and more specifically the methodological recommendations for CIS 2006 provided by Eurostat, the Statistical Office of the European Commission (see Appendices 1, 2). For the Innovation Survey 2005, the CIS 4 Core Questionnaire was modified slightly for South Africa through piloting exercises with businesses, a national stakeholder workshop organised by the National Advisory Council on Innovation (NACI) and the DST. The final South African Innovation Survey 2008 questionnaire (Appendix 3) was directly comparable with the CIS 4 instrument except for data fields on sources of funds, description of regions and the use of specific terminology that is applicable to South Africa. One of Eurostat's strongest recommendations is that, where possible, countries should make use of the most up-to-date version of their national business register for the innovation survey in order to promote international comparability.

Through the Memorandum of Agreement between Stats SA and the DST on official science and technology (S&T) statistics (which includes CeSTII by virtue of its survey agency role for the DST), Stats SA agreed to provide a suitable random sample and advice concerning the conduct of the survey as requested in the *Innovation Survey Sampling Specifications* document prepared by CeSTII.

2.2 Survey design and implementation

The survey design was informed by Eurostat guidelines and the structure of the Stats SA Business Register. It comprised of:

- A stratified random sample (by sector and size of enterprise) drawn from the Business Register database of Stats SA
- A postal survey with at least two telephonic contacts and two written communications (postal and e-mail)
- A non-response survey, which was to be conducted if the response rate was below 70%
- The extrapolation of results to the target population based on the weighted sample

Innovation surveys require a very high response rate (usually 70% or more) in order to ensure representative results. Based on the resources available to CeSTII for the survey and on the advice of Stats SA, a stratified random sample of 4 000 enterprises with appropriate weights for the mining, manufacturing and services sectors was obtained from the October 2007 Business Register of Stats SA, which also provided comprehensive documentation on the sampled enterprises (Stats SA, 2007).

The first part of 2008 was dedicated to confirming the accuracy of addresses and contact details (ideally the CEO) in the sample and identifying contact persons in the 4 000 enterprises. All non-valid enterprises (i.e. those that were not identifiable or traceable through several methods; duplicates and inactive entities) were removed from the database. The remaining entries in the database comprised 2 836 valid entries representing a total population of 22 849 enterprises. The CIS methodological guidelines do not recommend replacing non-valid enterprises.

The postal survey containing the survey questionnaire, together with a frequently asked questions booklet (Appendix 4) to assist respondents in completing the questionnaire, was dispatched in July 2008, and the survey remained in the field until November 2009. During this time, enterprises that did not respond promptly received at least two written communications (postal and e-mail) and two telephonic contact reminders to participate in the survey.

The realised sample, a total of 757 completed questionnaires, amounted to an overall return rate of 26.7% from a sample size of 2 836. This was a lower return rate than that achieved for the 2005 survey (37.3%) and far below the Eurostat optimal return rate of at least 70%. A non-response survey therefore became necessary in order to check whether or not there was a significant difference in the propensity to innovate between respondents and non-respondents.

In order to follow up on enterprises that had not responded to the survey, a non-response telephonic survey of a simple random sample of 15% of non-respondents was undertaken (following Eurostat's best practice recommendations). Non-respondents were assured that by just answering three simple questions asked about their innovation activities, they would not be contacted again regarding their obligation to complete the survey questionnaire. The three questions asked were as follows:

1. During the three years 2005 – 2007, did your enterprise introduce 'new or significantly improved goods or new or significantly improved services'?
2. During the three years 2005 – 2007, did your enterprise introduce new or significantly improved 'methods of manufacturing or producing goods or services', 'logistics, delivery or distribution methods for your inputs, goods or service', or 'supporting activities for your processes, such as maintenance and operating systems for purchasing, accounting or computing'?
3. During the three years 2005 – 2007, did your enterprise have any innovation activities to develop product or process innovations that were 'abandoned' during 2005 – 2007 or 'still ongoing' by the end of 2007?

A response rate of 50% was obtained from the non-response survey, which was deemed adequate (following Eurostat's best practice recommendations).

The purpose of the non-response survey was to determine the extent to which non-respondents were less or more innovative than respondents (i.e. a check for bias). Overall, the proportion of innovative non-respondents was significantly higher ($p = 0.000026$) when compared with the proportion of innovative responders, and the weights for the respondent innovators and non-innovators were accordingly adjusted at strata level to reflect this difference. A senior CeSTII statistician worked on these statistical and analytical issues and arrived at a final set of weights by using the methodology earlier developed by senior statisticians at the University of Cape Town and applied in the 2005 innovation survey. The results of the non-response survey were then used to adjust the weights of the strata for bias in the estimation of innovation rate that might arise from a low response rate. These weightings were also adjusted for invalid entries in the final target samples (enterprises that were found to have merged or liquidated) and missing weights due to having no responses at all in some sub-strata.

2.3 Statistical analysis

The statistical analysis comprised of computing descriptive statistics, such as the numbers and proportions of firms involved in various types of technological and non-technological innovation activities, classified by sector and size class. For quantitative indicators (such as turnover, expenditure, expenditure on innovation and number of employees), totals and proportions were also computed, based on a similar categorisation. All these statistics were population estimates that were obtained by using the adjusted weights to project from the realised sample to the population. The associated standard errors and confidence intervals were also computed and statistical tests of significance conducted and, where deemed necessary, applied to make inferences about the population.

In this survey, the 95% confidence interval for the 2008 innovation rate was calculated and compared with the corresponding 2005 survey confidence intervals to determine whether or not there had been a significant change in the innovation rate between the two survey periods. Bootstrap is a computer-based re-sampling method used for estimating standard errors, biases and confidence intervals for any given statistic (Efron and Tibshirani 1993). Thus, a further investigation to verify the results based on direct confidence intervals from the original samples was conducted based on a simulation study using 200 random bootstrap samples drawn with replacement from each of the original samples for the two survey periods. The number of bootstrap samples (m = 200) was based on simulation studies by Pattengale *et al.* (2009), who found that their stopping criteria typically stopped computations after 100 – 500 bootstrap replicates, where the stopping criteria were thresholds computed at runtime to determine when enough replicates had been generated in order to determine levels of significance. Each bootstrap sample was drawn by using the same sample size and stratification as the original parent sample.

An important aspect of the South African Innovation Survey is that enterprise size classes are officially determined by turnover and not employee numbers. Turnover is currently used as an official proxy for size classes of enterprises rather than the number of personnel. The relationship between turnover and the number of full-time employees is prescribed by a schedule contained in the National Small Business Amendment Act (Act No. 26 of 2003). Enterprises are divided into four size classes. The criteria used to differentiate between the four size classes are also sector specific. Table 2.1 shows the criteria used to group the enterprises into their respective size classes based on their sector and turnover:

Eurostat has recommended that the CIS 2006 should target only enterprises that have ten or more employees. Due to the limitations of Stats SA's Business Register, this cut-off point had to be treated differently for South Africa. The level of turnover of enterprises in the Stats SA Business Register is used to determine a cut-off point for enterprises with fewer than ten personnel. Very small enterprises [enterprises with a turnover of less than R3 – 6 million per year, depending on the SIC sector, and enterprises employing fewer than 20 personnel in terms of the National Small Business Amendment Act (2003)] were cut off at the 30.5 percentile by Stats SA. Only enterprises above this percentile were thus included in the sample frame.

Several issues were encountered and had to be addressed. Firstly, as a result of untraceable or expired companies (invalid respondents), the usual weights obtained by dividing the population size by sample size for each sub-stratum were not appropriate, because the actual sample and the population sizes were smaller than or equal to the original sizes based on the Stats SA Business Register, which effectively meant a reduced population size, and this was estimated from the reduced sample size expressed as a proportion of the original sample size. Secondly, part of our traceable sample refused to respond, and hence the assumption was made that the same rate of innovation, based on a subsequent simple random sample of non-respondents, applied across all non-respondents regardless of the sub-stratum or size class. Thirdly, of the valid respondents, some were found to be innovative, while the others were non-innovative.

The final results were thus calculated for a smaller number of enterprises than the population listed in the Stats SA Business Register, but the results of the mostly qualitative questions are representative for the relevant business sectors. If anything, the final results are probably on the conservative side and tend to provide an underestimation

TABLE 2.1: Stats SA size class (turnover in Rands) based on the National Small Business Amendment Act (2003)

Sector	SIC*	Large	Medium	Small	Very small
		more than	less than	less than	less than
Mining & Quarrying	2	39 000 000	39 000 000	10 000 000	4 000 000
Manufacturing	3	51 000 000	51 000 000	13 000 000	5 000 000
Electricity, Gas & Water	4	51 000 000	51 000 000	13 000 000	5 100 000
Wholesale	61	64 000 000	64 000 000	32 000 000	6 000 000
Retail	62	39 000 000	39 000 000	19 000 000	4 000 000
Transport, Storage & Communication	7	26 000 000	26 000 000	13 000 000	3 000 000
Financial intermediation	81	26 000 000	26 000 000	13 000 000	3 000 000
Computer and related	86	26 000 000	26 000 000	13 000 000	3 000 000
Research & Development	87	26 000 000	26 000 000	13 000 000	3 000 000
Architectural & Engineering	8 821	26 000 000	26 000 000	13 000 000	3 000 000
Technical testing	8 822	26 000 000	26 000 000	13 000 000	3 000 000

*SIC = Standard Industrial Classification code
The size classification would be as indicated in Table 2.2, if employee numbers were used.

TABLE 2.2: Stats SA size class (employee number) based on the National Small Business Amendment Act (2003)

Size 1 (Large enterprises)	Enterprises with more than 200 employees
Size 2 (Medium enterprises)	Enterprises with fewer than 200 employees but more than 50
Size 3 (Small enterprises)	Enterprises with fewer than 50 employees but more than 20
Size 4 (Very small enterprises)	Enterprises with fewer than 20 employees

of innovation activities in the country. The totals calculated for the quantitative questions on turnover, expenditure and number of personnel are expected to be lower than national totals measured in other specific labour force or industry surveys. The reasons for this are threefold: (i) the low response rate, (ii) the cut-off percentiles used by Stats SA and (iii) the reduction in the number of valid enterprises in the database. The estimated national totals are expected to be comparable with those in specific industry surveys, because we have imputed missing turnover and expenditure values for a given sub-sector and size class, based on the available data. Moreover, the relative proportions, such as the percentage of employees working for innovative enterprises, are more important than the actual numbers. In terms of quantitative data, the survey results are thus also conservative.

Although an analysis of the preliminary survey data had shown significant correlation between turnover and employee numbers, this relationship proved to be rather weak for the survey as a whole. It appears that turnover is not a reliable proxy for the size of a given enterprise. The size classes thus represent the extent of the turnovers of enterprises rather than the number of employees. The National Small Business Amendment Act (2003) prescribes the use of turnover for the delineation of size classes of enterprises. The size classes used in this report reflect official South African policy, and the results will therefore differ from those collected in the EU where size class is based only on the number of personnel. Furthermore, the size classes prescribed in the National Small Business Amendment Act (2003) differ from those used in the EU. Any comparisons with countries that base their size classes on employee numbers, as recommended by CIS 4 methodology, should be viewed in the light of these differences. A number of other countries, such as China and Malaysia, also use turnover as a proxy for size of enterprises. This does not detract from the nature of the survey results for the main survey population and in particular the results for the largest two size classes, which are generally robust because of the relatively large sample size and consequent sector coverage.

CHAPTER 3

RESULTS

3.1 Rate of innovation

Innovation activities include the acquisition of machinery, equipment, software, licences, engineering and development work, training, marketing and R&D. These activities can only be counted as innovation when they are specifically undertaken to develop and/or significantly improve an existing product or process. The 2008 innovation survey results represent the activities of a total of 22 849 enterprises, 65.4% of which reported undertaking technological innovation activities. Of all the innovative enterprises, 27.2% had successful technological innovations, meaning that they completed product and/or process innovations during the three years covered by the survey. A further 33.7% indicated that they had 'ongoing only' innovation activities; 1.0% had 'abandoned only' innovation activities and the remaining 3.5% indicated they had both abandoned and ongoing activities.

The technological innovative enterprises comprised 10.3% with 'process only innovations'; 8.9% with 'product only' innovations; and 7.9% with both 'product and process' innovations. The survey distinguished between technological and non-technological innovations. In terms of non-technological innovations, 51.2% of enterprises had organisational innovations and 27.1% had marketing innovations. Table 3.1 shows that 68.8% of industrial enterprises were innovative compared to 61.3% of service enterprises.

The 2008 survey shows increasing innovation activity with increasing size class. Figure 3.1 shows that the large enterprise group had the highest innovation rate of almost 75%, compared with an innovation rate of 60% in the group of very small enterprises. It should be noted, however, that in the 2005 survey, where turnover was also used to determine the size of enterprises, there was no strong relationship between the size of enterprises and the rate of innovation. In other countries and in previous innovation surveys undertaken in South Africa, where size of enterprises was determined by number of personnel, there is a much clearer trend of increasing innovation activity with increasing size classes of enterprises.

TABLE 3.1: Innovation rate: Percentage innovation for innovative and non-innovative enterprises, 2005 – 2007

Type of innovation	Total (%)	Industry[a] (%)	Services[b] (%)
Enterprises with innovation activity	**65.4*	*68.8*	*61.3*
Product only innovators	8.9	7.6	10.4
Process only innovators	10.3	4.5	17.2
Product and process innovators	7.9	8.8	7.0
Enterprises with ongoing or abandoned activities	38.2	47.9	26.7
Enterprises without innovation activity	*34.6*	*31.2*	*38.7*

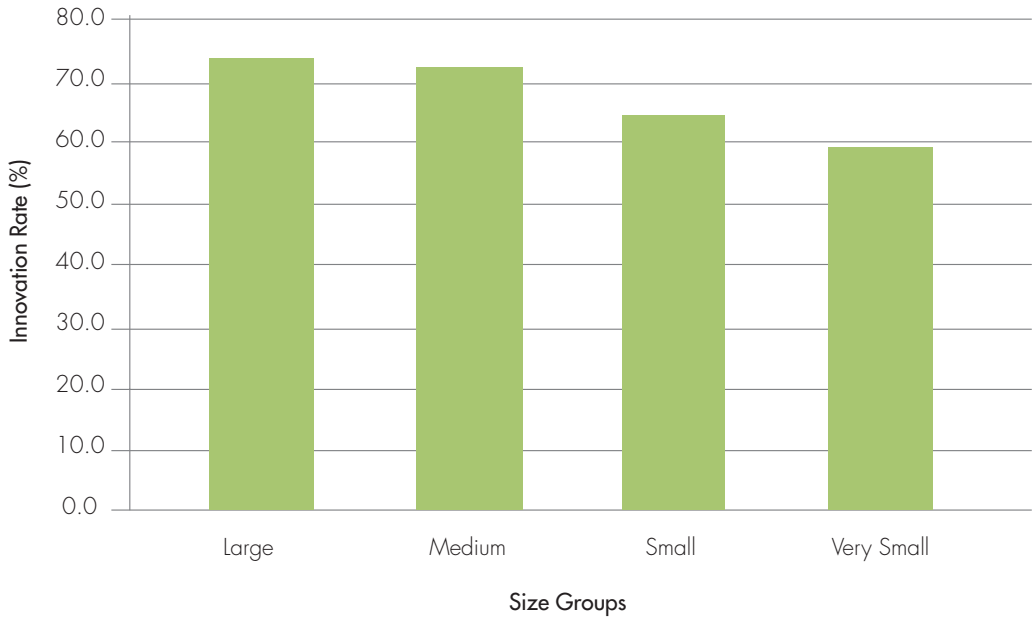
(a) Industry comprises mining and quarrying, manufacturing, electricity, gas and water supply.

(b) Services comprise wholesale and retail, transport, storage and communication, financial intermediation, computer & related R&D services, architectural & engineering, and technical testing.

The ***EU average*** for enterprises with innovation activity is 39% in total: 41.2% for industry and 36.0% for the services sector.

Source: Appendix 5 Tables A1.1 and A1.2
*Numbers do not always total exactly because of rounding effects.

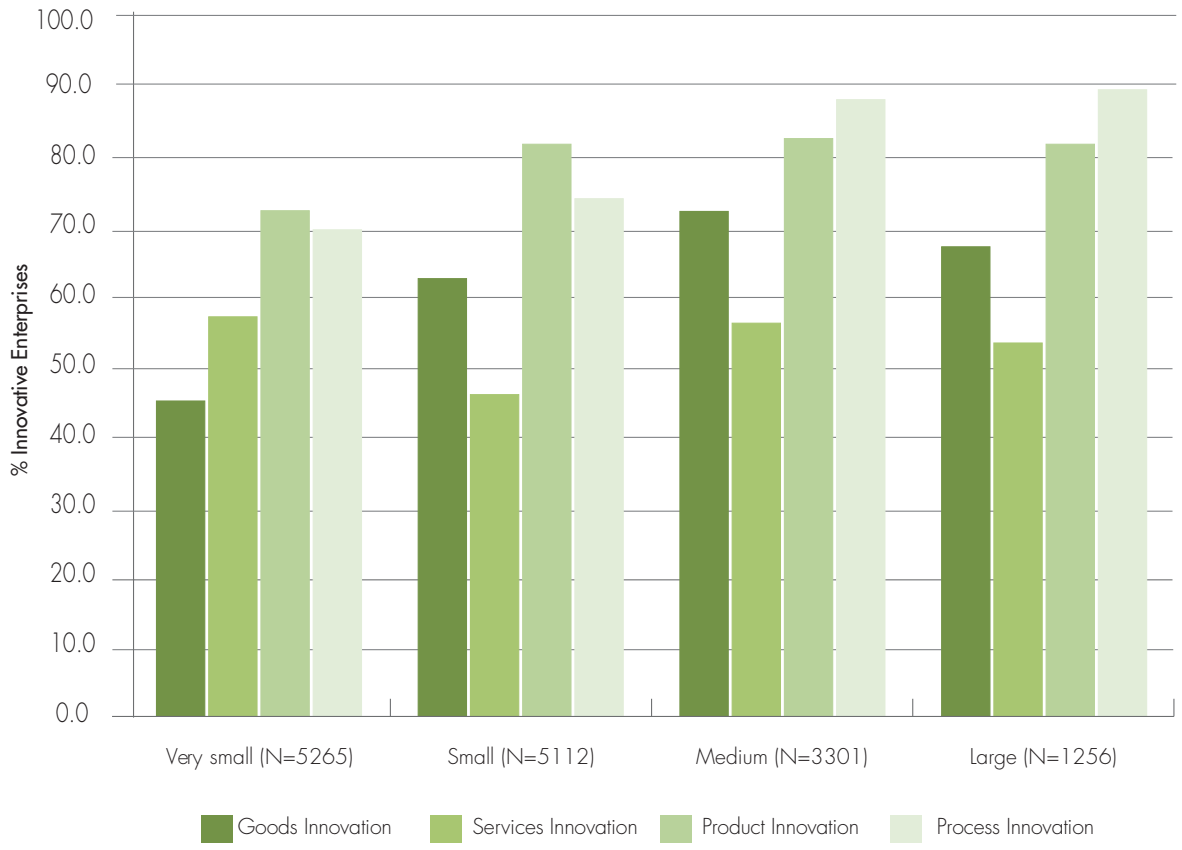
FIGURE 3.1: Percentage of enterprises with innovation activity, by size class, 2005 - 2007



Source: Appendix 6 Tables B1.1 and B1.2

Figure 3.2 gives a clearer indication of innovation rate according to types of innovation within the four different size classes of enterprises. The most active innovators were process innovators in the categories of large and medium-sized enterprises with innovation rates of almost 90%. There is a clear pattern among 'goods innovators' of increasing innovation activity as enterprise size increases. This pattern is not as prominent among 'service innovators', but when 'goods and service' innovations were considered together, this pattern emerged again.

FIGURE 3.2: Innovation activities according to size class, 2005 – 2007

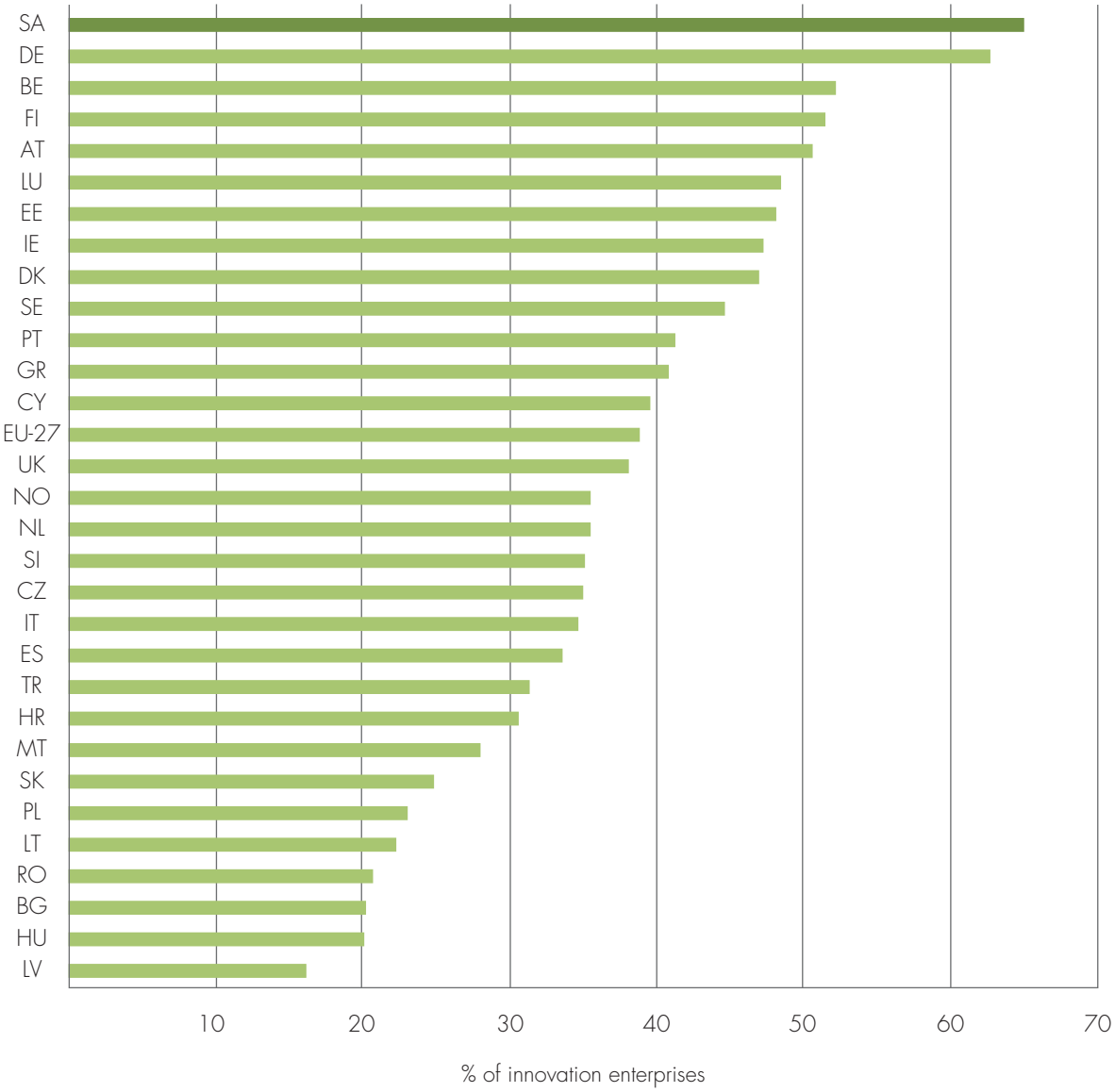


Source: Appendix 6 Tables B1.3

The overall innovation rate of 65.4% shown in Figure 3.3 is much higher when compared to European countries such as Germany (62.6%), Belgium (52.2%), Finland (51.4%) or Luxembourg (48.5%). The innovation rate recorded in the 2008 innovation survey is also higher than the rate of 51.7% recorded in the 2005 survey; however, statistical tests have shown that this increase is not significant at the 95% confidence level.

In the majority of European countries, industrial enterprises are more innovative than service enterprises, but in a few countries such as Luxembourg, Spain, Malta, Sweden and Austria, the rates of innovation in the services sector are higher than those in industry (Figure 3.4). The proportion of enterprises engaged in innovation activities ranged from 77% for services in Luxembourg to 23% for industry in the same country. In South Africa 68.8% of industrial enterprises were innovative compared with 61.3% of enterprises in the services sector.

FIGURE 3.3: Share of innovative enterprises as a percentage of all enterprises (EU member states and selected countries including South Africa), 2005 – 2007

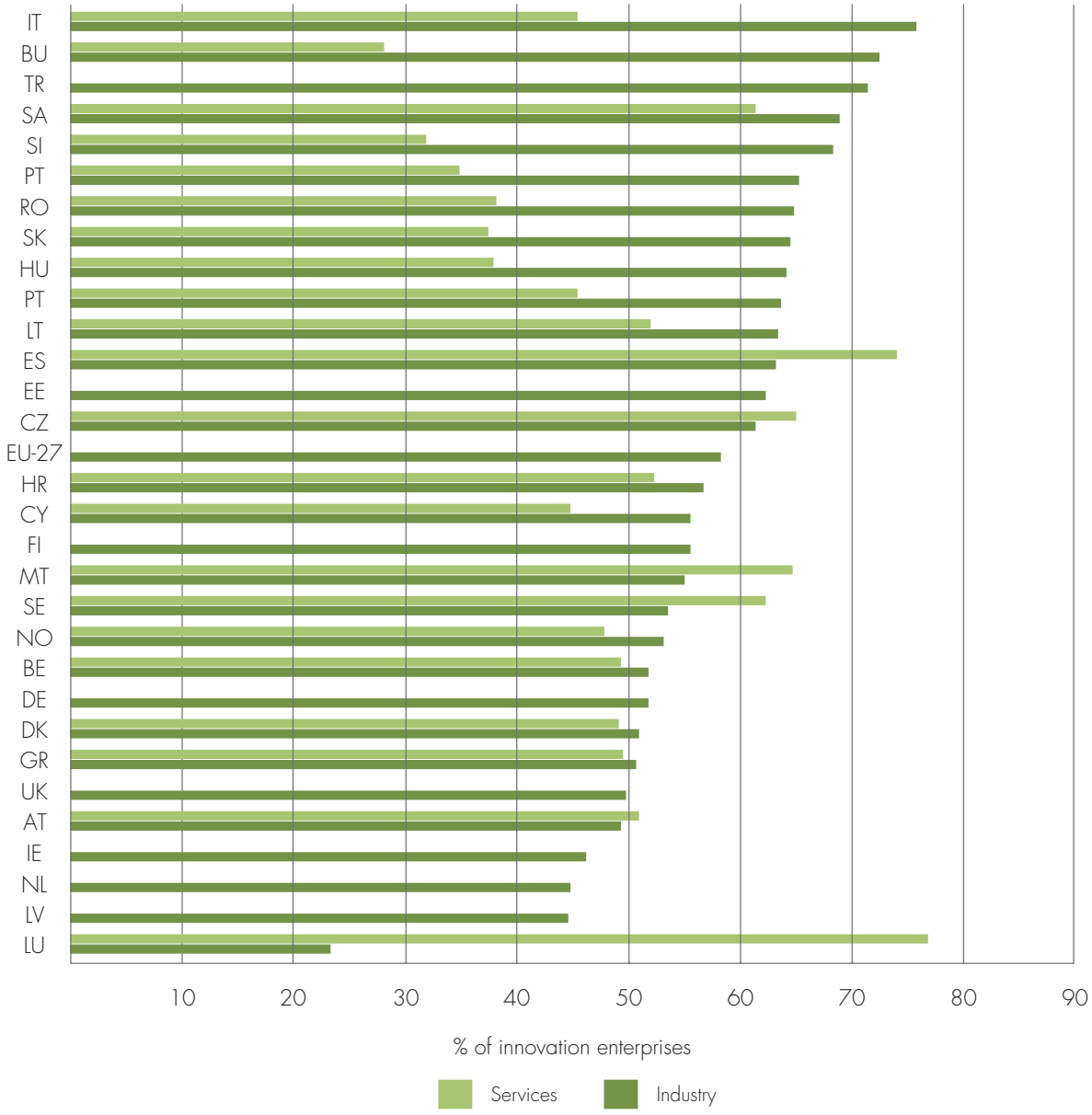


Note: All EU data are for the reference period 2004 – 2006.

In this figure and elsewhere the following acronyms are used: AT Austria; BE Belgium; BG Bulgaria; CY Cyprus; CZ Czech Republic; DE Germany; DK Denmark; EE Estonia; GR Greece; ES Spain; EU-27 European Union average (27 countries); FI Finland; FR France; HU Hungary; IE Ireland; IS Iceland; IT Italy; LT Lithuania; LU Luxembourg; LV Latvia; MT Malta; NL Netherlands; NO Norway; PL Poland; PT Portugal; RO Romania; SA South Africa; SE Sweden; SI Slovenia; SK Slovakia; UK United Kingdom. Since 1991, the former German Democratic Republic has been included as part of Germany.

Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Tables A1.1 and A1.2

Figure 3.4: Enterprises engaged in innovation activity as a percentage of all enterprises in industry and services (EU member states and selected countries including South Africa), 2005 – 2007



Note: All EU data are for the reference period 2004 – 2006.

Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Tables A1.1 and A1.2

3.2 Characteristics of enterprises covered by the survey

The 22 849 enterprises of the imputed survey population employed about 3.52 million employees, some 92% of whom worked in enterprises with innovation activities (Table 3.2).

Total turnover of the enterprises was recorded as R3 311 billion. Enterprises with innovation activities accounted for about 85.2% of this turnover (Table 3.2). The services sector was more innovation intensive, with 86.8% of turnover accounted for by service enterprises with innovation activities, compared to the 83.5% of turnover generated by innovative industrial enterprises.

TABLE 3.2: Total enterprises, number of employees and turnovers: comparison of enterprises with innovation activities, 2005 – 2007

Total enterprises, number of employees and turnovers	Total (number)	Industry (%)	Services (%)	Total (%)
Total number of enterprises	*22 849*	54.3	45.7	*100.0*
Enterprises with innovation activities	*14 934*	68.8	61.3	*65.4*
Number of employees	*3 520 608*	49.3	50.7	*100.0*
Number of employees in enterprises with innovation activities	*3 249 997*	90.8	93.8	*92.3*
Turnover (R billions)	*3 311*	45.6	54.4	*100.0*
Turnover (R billions of enterprises with innovation activities)	*2 820*	83.5	86.8	*85.2*

Source: Appendix 5 Tables A1, A2 and A3

The majority of enterprises in the population were independent enterprises and not part of a larger group (Table 3.3). Only 19.6% of enterprises were part of a larger group, and most of these were medium-sized and small enterprises.

Table 3.4 shows that large innovative enterprises were responsible for the greatest contribution to turnover through innovation activities (86.5%) and innovative enterprises accounted 85.3% of all turnover. While non-innovative firms accounted for 34.6% of all enterprises covered in the survey (data not shown), they were responsible for only 14.7% of the total turnover recorded.

TABLE 3.3: Enterprises stating that they were part of a larger group, 2005 – 2007

Size class	Large	Medium	Small	Very small	Total
Enterprise group status (number)					
Part of a larger group	1 041	1 156	1 725	566	*4 488*
Not part of a larger group	634	3 385	6 088	8 254	*18 361*
Enterprises which did not respond to the question	0	0	8	0	*8*
Enterprise group status (%)					
Part of a larger group	4.6	5.1	7.5	2.5	**19.6*
Not part of a larger group	2.8	14.8	26.6	36.1	*80.3*
Enterprises which did not respond to the question	0.0	0.0	0.0	0.0	*0.0*

Source: Appendix 6 Table B28
*Numbers do not always total exactly because of rounding effects.

TABLE 3.4: Number and percentage of enterprises with innovation activity by size class and turnover, 2007 (year specific question)

Size class	Large	Medium	Small	Very small	Total
Turnover category					
All enterprises: turnover (R billions)	2 969	224	88	28	3 311
Enterprises with innovation activity: turnover (R billions)	2 566	184	57	16	2 825
Percentage of total turnover contributed by enterprises with innovation activity	**86.5**	**82.3**	**64.8**	**55.3**	**85.3**
Enterprises without innovation activity: turnover (R billions)	402	39	31	12	*486
Percentage of total turnover contributed by enterprises without innovation activity	**13.5**	**17.7**	**25.2**	**44.7**	**14.7**

Source: Appendix 6 Table B3
*Numbers do not always total exactly because of rounding effects.

Table 3.5 shows clearly that 92.3% of the total employment of all the enterprises that were included in the survey was in the innovative enterprises. The results of the survey did not establish a clear relationship with respect to the direct impact of innovation on changes in employment at firm level, if any. Innovative enterprises, however, employed more staff than non-innovative enterprises. Large enterprises that were active in innovation employed approximately 95% of the total number of employees in this size group, and innovative medium-sized enterprises employed about 93% of all employees in this size group.

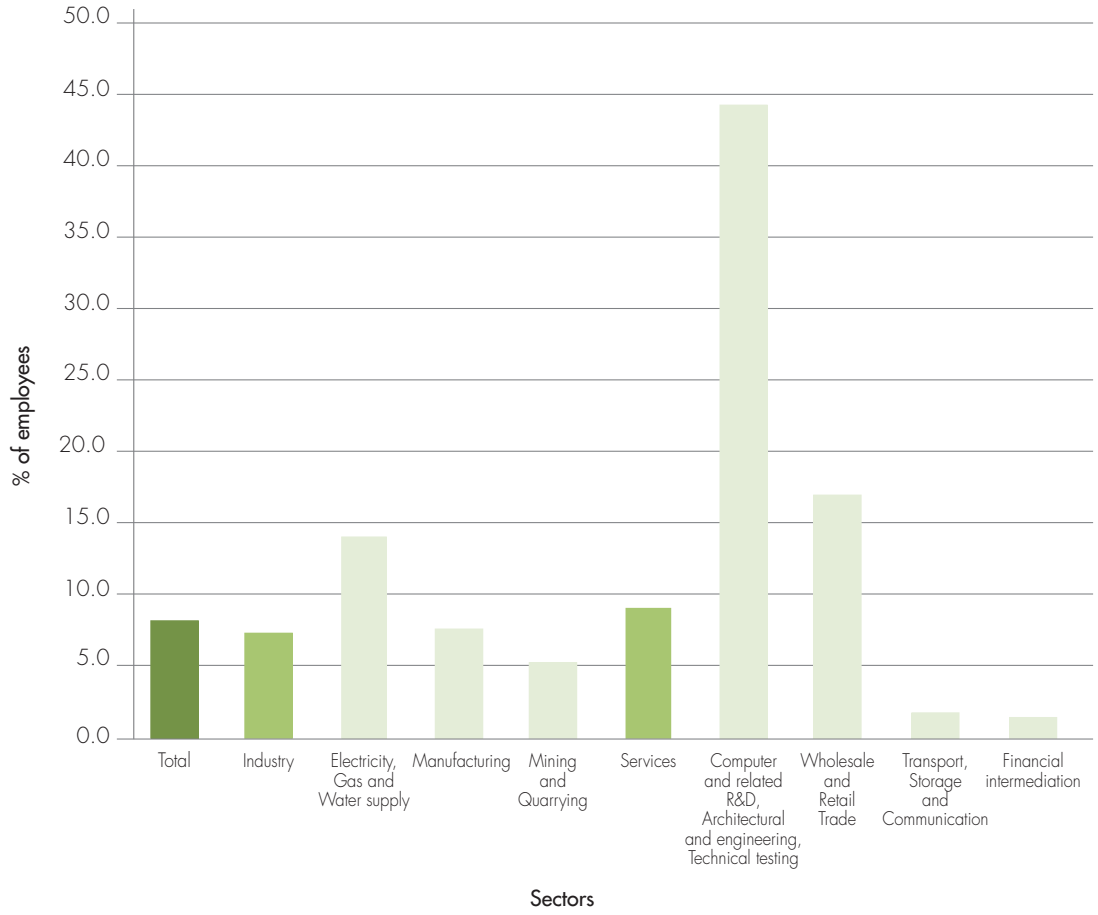
TABLE 3.5: Enterprises with innovation activity by size class and number of employees, 2007 (year specific question)

Size class	Large	Medium	Small	Very small	Total
Number and percentage of employees by innovation activity					
All enterprises - number of employees (thousands)	2 479	733	196	111	**3 520*
Enterprises with innovation activity - (% of employees)	95.3	93.2	69.8	59.5	*92.3*
Enterprises without innovation activity - (% of employees)	4.7	6.8	30.2	40.5	*7.7*

* Numbers do not always total exactly because of rounding effects
Source: Appendix 6 Table B2

Innovative enterprises employed 3 249 997 staff of whom 266 523 employees, or 8.2% of the total (Figure 3.5), had a tertiary education qualification (diploma or degree). The 2005 innovation survey reported that at least 13% of employees in innovative enterprises had a tertiary education, which indicates that there has been a decrease in the percentage of graduates employed by companies. In the industrial sector, enterprises engaged in electricity, water and gas had the highest number of employees with a tertiary qualification (14%), while the percentage in the manufacturing enterprises decreased from 16% in the 2005 innovation survey, to 8% in the 2008 survey. In the services sector, the highest percentages of employees with a tertiary education were in computer and related R&D, architectural and engineering, and technical testing enterprises (43.9%).

FIGURE 3.5: Percentage of employees in innovative enterprises with a degree or diploma, 2007 (year specific question)



Source: Appendix 5 Table A20

Innovative enterprises appeared to be more export-oriented than non-innovative enterprises (Table 3.6). Among non-innovative enterprises, about 65% sold goods and services only in some provinces of South Africa, compared to 40% of innovative enterprises. Other African countries were an important destination for goods and services produced by innovative enterprises (28.8%), followed by Europe (20.4%) and the United States (13.2%).

TABLE 3.6: Geographic distribution of goods and services sold by innovative and non-innovative enterprises, 2005 – 2007

Proportion of enterprises (%)	Total	Industry	Services
Geographic distribution – All enterprises			
South Africa (Only some provinces)	*48.9*	48.5	49.4
South Africa (National)	*47.7*	51.7	43.0
Rest of Africa	*22.3*	27.5	16.0
Europe	*15.3*	22.9	6.2
United States	*9.5*	16.3	1.4
Asia	*9.3*	13.4	4.5
Other Countries	*10.9*	16.7	4.2
Geographic distribution – Enterprises with innovation activity			
South Africa (Only some provinces)	*40.2*	41.2	38.9
South Africa (National)	*56.6*	60.3	51.8
Rest of Africa	*28.8*	35.9	19.3
Europe	*20.4*	31.4	5.7
United States	*13.2*	21.9	1.7
Asia	*12.8*	19.1	4.5
Other Countries	*13.7*	21.7	2.9
Geographic distribution – Enterprises without innovation activity			
South Africa (Only some provinces)	*65.2*	64.6	65.9
South Africa (National)	*30.9*	32.7	28.9
Rest of Africa	*10.0*	8.9	10.8
Europe	*5.7*	4.3	7.1
United States	*2.5*	4.0	1.0
Asia	*2.7*	0.7	4.6
Other Countries	*5.8*	5.5	6.2

Source: Appendix 5 Table A17

3.3 Types of innovations

The methodology of the South African innovation survey recognises four types of innovation, (namely product, process, marketing and organisational innovations). In the 2008 innovation survey, enterprises answered questions concerning their innovation activities in each of the four categories of innovation. The rates of innovation for each type are shown in Figure 3.6. Relatively few enterprises had 'process only' (10.3%) or 'product only' (8.9%) innovations, while 7.9% had both 'product and process' innovations. The remaining 38.2% of enterprises reported 'abandoned' or 'ongoing' innovation activities. Organisational innovations were found in 51.2% of enterprises and marketing innovations in 27.1%. The overall innovation rate, which includes all technological innovations, was 65.4%

FIGURE 3.6: Innovation rate by type of innovation, 2005 – 2007*

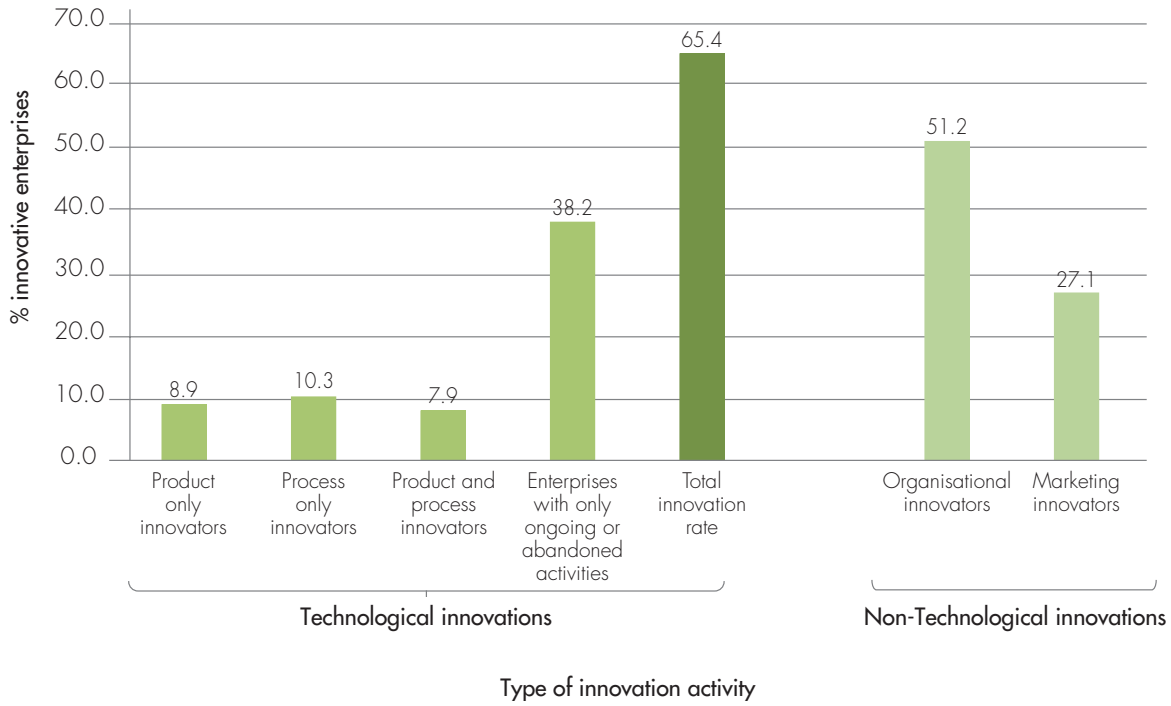
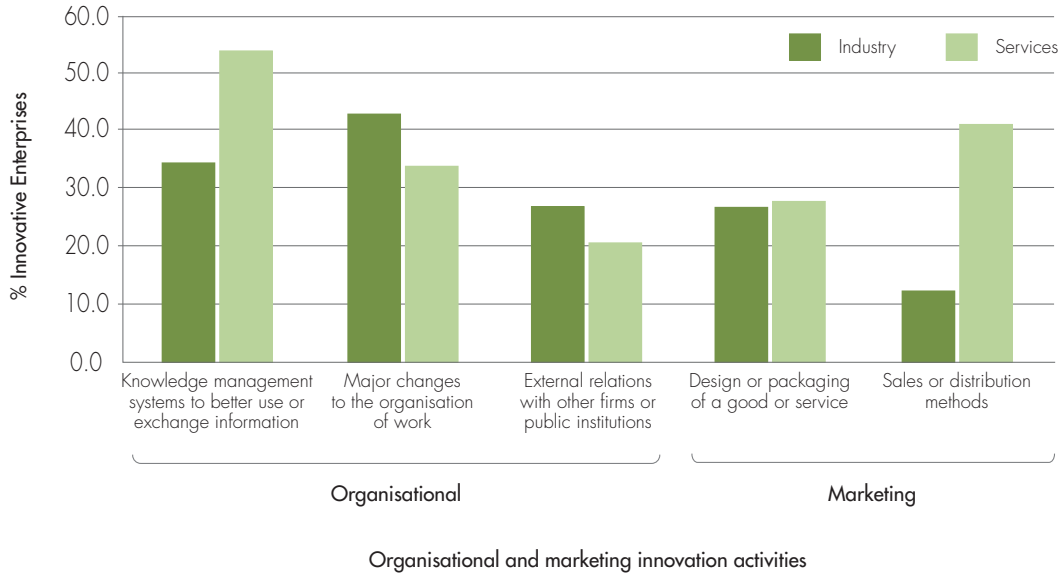


*Figure 3.6 to be read in conjunction with Table 3.1.
Source: Appendix 5 Table A1 and A21

Figure 3.7 provides more detail on the organisational and marketing innovations undertaken by innovative South African enterprises. Enterprises in the services sector were generally more active in the marketing aspects of innovation, while industry was more active in organisational innovations. In terms of organisational innovations, 43.0% of enterprises introduced 'knowledge management systems to better use or exchange information', while 39.4% introduced 'major changes to the organisation of work' (see Appendix 5 Table A14).

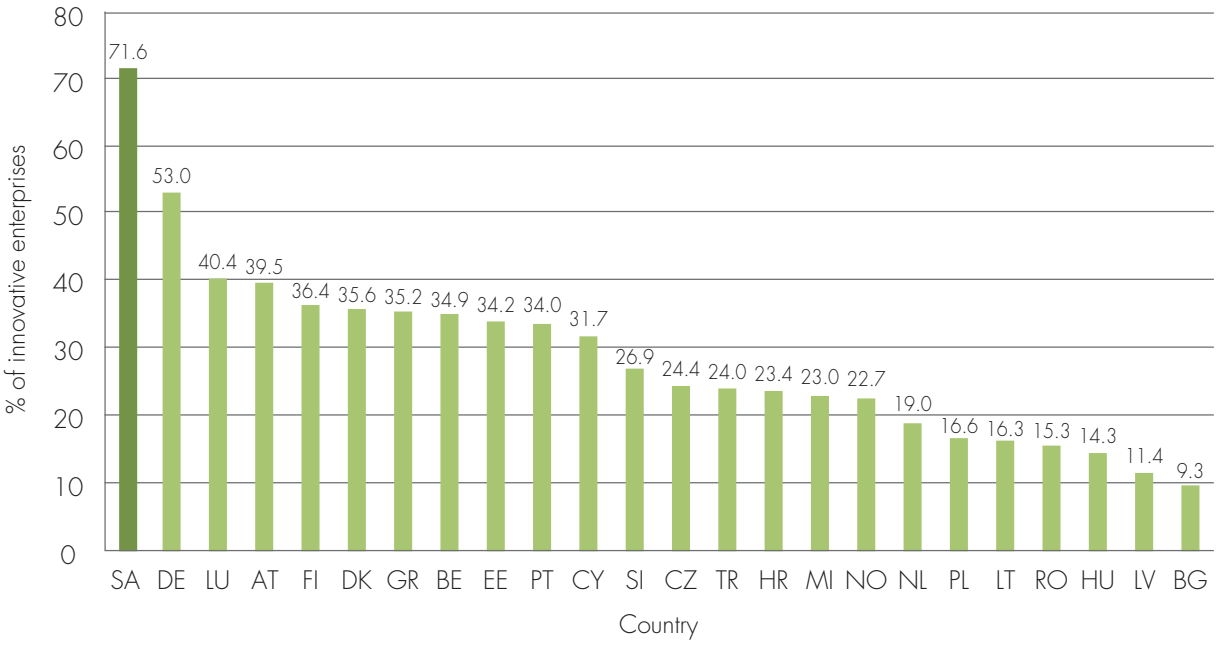
FIGURE 3.7: Percentage of innovative enterprises that introduced organisational or marketing innovation, 2005 – 2007



Source: Appendix 5 Table A14

Figure 3.8 shows the EU international comparisons of the percentage of enterprises engaged in innovation activities that introduced organisational and/or marketing innovations. Innovative South African enterprises were more active in this regard than their European counterparts: 71.6% of South African enterprises with innovation activity recorded some form of organisational or marketing innovations, compared with 53.0% in Germany or 40.4% in Luxembourg for example. The high score in South Africa perhaps reflects the changes that many enterprises have had to make in response to the demands of national and international policies and regulations as well as various market-related factors.

FIGURE 3.8: Percentage of innovative enterprises that introduced organisational and/or marketing innovations (EU member states and selected Countries including South Africa), 2005 – 2007



Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Table A21

3.4 Product (goods or services) innovation

Enterprises that had product innovations (comprising innovation in either goods or services produced) accounted for fewer innovators than those with process innovations. Approximately 8.5% of the turnover of product innovators in 2007 was generated by innovations that were new to the market, representing a turnover of about R209 billion (Table 3.7). Table 3.8 shows that small and medium-sized enterprises generated the highest percentage of turnover based on product innovations that were new to the market (15.7% and 14.6% respectively), as well as from product innovations that were new to the firm (10.2% and 16.1% respectively). A total of 6.5% of turnover was generated by the sale of products that were new to the enterprise concerned but not new to the market. Overall, large enterprises generated the highest turnover from product innovations (91.1%).

TABLE 3.7: Product innovators: proportion of turnover attributed to types of product innovations, 2007 (year specific question)

Type of Product innovations	Turnover generated (R millions)	Percentage turnover generated
Product innovations new to the market	209 505	8.5
Product innovations new to the firm	160 466	6.5
Products unchanged or only marginally modified	2 101 065	85.0
Total	**2 471 036**	**100.0**

Source: Appendix 5 Table A5.1

TABLE 3.8 Product innovators: proportion of turnover in 2007 attributed to the types of products, by size of enterprises (%)

Size Class	Large (%)	Medium (%)	Small (%)	Very small (%)	Total (%)
Type of Product innovations					
Product innovations new to the market	7.9	14.6	15.7	10.6	*8.5*
Product innovations new to the firm	5.7	16.1	10.2	9.5	*6.5*
Products unchanged or only marginally modified	86.4	69.3	74.1	79.9	*85.0*
Total (% of turnover produced by product innovators by enterprise size class)	**91.1**	**6.4**	**2.0**	**0.4**	***100.0**

Source: Appendix 6 Table B5.2
*Numbers do not always total exactly because of rounding effects.

Table 3.9 gives an international comparison of the enterprises that introduced new or improved products to the market as a percentage of innovative enterprises. The 2008 innovation survey indicates a drop in the percentage of South African enterprises that introduced new or improved products to the market. The 2005 innovation survey reported that 80.4% of innovators had products that were new to the market, while in the current survey this figure dropped to 48.2%.

TABLE 3.9: Enterprises that introduced new or improved products to the market as a percentage of enterprises engaged in innovation activity by sector (EU member states and selected countries, including South Africa), 2005 – 2007

Country	Total	Industry	Services
Turkey	59.6	43.7	:
Luxembourg	58.9	12.6	46.7
Sweden	51.3	26.8	33.2
Slovenia	51.1	34.2	16.9
Greece	49.5	26.4	23.1
South Africa	**48.2**	**53.4**	**41.3**
Netherlands	48.1	22.3	:
Austria	45.4	23.2	22.3
Latvia	44.7	20.3	:
Finland	44.6	24.4	:
Belgium	41.4	21.5	20.3
Bulgaria	41.3	30.4	11.1
Ireland	40.8	20.2	:
Norway	39.9	18.8	21.3
Czech Republic	38.9	26.2	18.6
Slovakia	37.6	24.7	14.1
Lithuania	36.0	20.8	21.3
Cyprus	34.5	20.3	14.0
Denmark	33.8	18.6	15.1
Estonia	32.8	18.9	:
Poland	32.7	20.7	12.0
EU 27	32.6	19.8	:
Croatia	31.7	20.6	14.7
United Kingdom	31.6	15.2	:
Malta	31.3	18.5	16.9
Hungary	30.9	19.6	12.5
Germany	30.4	18.0	0.0
Portugal	29.8	18.7	13.4
Italy	29.5	24.0	7.3
Romania	24.7	17.1	9.2
Spain	18.3	13.1	7.9

Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Table A27
: = data not available

In the EU, the introduction of new or significantly improved products among more than 50% of innovative enterprises was found in only four countries (Turkey, Luxembourg, Sweden and Slovenia). Among the EU-27 countries, an average of about one third of innovative enterprises introduced new or improved products to the market. In South Africa, the share of innovative industrial enterprises that introduced new or significantly improved products to the market (53.4%) was substantially higher than the equivalent share of innovative services enterprises (41.3%).

Table 3.10 shows that product innovations by innovative enterprises were developed mainly by the enterprise itself (63.8%). Collaboration with other enterprises or institutions was the source of development of product innovations for 16.0% of innovators, while 20.2% of innovators relied on other enterprises or institutions to develop their innovations.

TABLE 3.10: Responsibility for the development of product innovations in innovative enterprises, 2005 – 2007

Product innovations developed mainly by:	Number of enterprises	Percentage of enterprises (%)
Mainly own enterprise	7 409	63.8
Own enterprise in collaboration with other enterprises or institutions	1 862	16.0
Other enterprises or institutions	2 342	20.2
Enterprises which did not respond to the question	0	0.0
Total	**11 612*	*100.0*

Source: Appendix 5 Table A6
*Numbers do not always total exactly because of rounding effects.

TABLE 3.11: Responsibility for the development of product innovations by innovative enterprises by size class, 2005 – 2007

Size class	Large	Medium	Small	Very small	Total
Product innovations developed mainly by:					
Mainly own enterprise (%)	56.1	43.4	69.4	74.3	*63.8*
Own enterprise in collaboration with other enterprises or institutions (%)	31.0	41.6	6.5	4.1	*16.0*
Other enterprises or institutions (%)	12.8	15.0	24.1	21.6	*20.2*
Enterprises which did not respond to the question(%)	0.0	0.0	0.0	0.0	*0.0*
Total	*1 016*	*2 698*	*4 136*	*3 763*	**11 612*

Source: Appendix 6 Table B6
*Numbers do not always total exactly because of rounding effects.

About 70% of the small innovative enterprises and just fewer than 75% of the very small innovative enterprises reported that their product innovations were developed mainly by their own enterprise (Table 3.11). A total of 41.6% of medium-sized enterprises reported collaborating with other enterprises or institutions in developing product innovations, while only 4.1% of innovators in very small enterprises reported such collaboration. Almost 25% of innovators in the small enterprises group and 12.8% of innovators in the large enterprises group were dependent on other enterprises or institutions to develop their innovations. One in five of all innovative enterprises looked to other enterprises and institutions for the development of their innovations.

3.5 Process innovation

Process innovation is the use of new or significantly improved methods for the production or supply of goods and services. Process innovations are very important in that they often lead to better quality control, greater efficiency, compliance with new regulations and lesser wastage. Process innovations are less tangible than the development and sales of new innovative products and services, but they nevertheless benefit enterprises through improved quality or cost-saving in the production of goods and services.

New or significantly improved supporting activities for processes were reported by 34.5% of process innovators, including maintenance and operating systems for purchasing, accounting or computing (Table 3.12). This was followed by improved methods in manufacturing or production (30.8%). Only 15.5% of process innovators spent time improving their delivery and distribution methods.

TABLE 3.12: Enterprises involved in specific process innovations, 2005 – 2007

Number of enterprises	*Total*	Industry	Services
Process innovations			
Methods of manufacturing or production	***7 032***	5 167	1 865
Delivery or distribution methods	***3 544***	1 692	1 853
Supporting activities	***7 871***	4 082	3 790
Percentage process innovators (%)			
Process innovations			
Methods of manufacturing or production	***30.8***	41.7	17.8
Delivery or distribution methods	***15.5***	13.6	17.7
Supporting activities	***34.5***	32.9	36.3

Source: Appendix 5 Table A24

Process innovations were mostly developed in-house: 58.5% of enterprises reported that innovations were mainly developed by their own enterprise. Some 22.6% of enterprises developed process innovations in collaboration with other enterprises or institutions (Table 3.13). Only 18.8% of enterprises relied mainly on other enterprises or institutions for the development of process innovations.

TABLE 3.13: Responsibility for the development of process innovations, 2005 – 2007

Process innovations mainly developed by:	Total	Industry	Services
Number of process innovators			
Mainly own enterprise	*6 642*	4 278	2 364
Own enterprise in collaboration with other enterprises or institutions	*2 567*	1 376	1 191
Other enterprises or institutions	*2 136*	761	1 375
Enterprises which did not respond to the question	*6*	0	6
Process innovations mainly developed by:			
Percentage process innovators (%)			
Mainly own enterprise	*58.5*	66.7	47.9
Own enterprise in collaboration with other enterprises or institutions	*22.6*	21.5	24.2
Other enterprises or institutions	*18.8*	11.9	27.9
Enterprises which did not respond to the question	*0.1*	0.0	0.1

Source: Appendix 5 Table A25

The majority of process innovations (61.0%) were developed within South Africa (Table 3.14) while 15.0% of process innovations originated mainly from abroad. This indicates that South African enterprises appear to be quite capable of developing their own new processes and are not as dependent on foreign technology as is sometimes reported (Oerlemans et al. 2004).

Table 3.15 shows that of the 11 612 product innovative enterprises, 76.0% reported that their innovations originated in South Africa. Only 24.0% reported that their innovations were developed abroad. This is an indication that South Africa has gradually moved away from being a 'technology colony' as reported by previous South African innovation surveys. A similar pattern emerges when the industrial and services sectors were considered separately. In both sectors, more than 70% of enterprises reported that their innovations were developed predominantly in South Africa.

TABLE 3.14: Origin of process innovation, 2005 – 2007

Size Class	Large	Medium	Small	Very small	Total
Origin of process innovation (number)					
South Africa	715	2 344	3 685	2 364	*9 108*
Abroad	392	534	55	1 256	*2 237*
Enterprises which did not respond to the question	149	423	1 371	1 645	**3 589*
Origin of process innovation (%)					
South Africa	56.9	71.0	72.1	44.9	*61.0*
Abroad	31.2	16.2	1.1	23.9	*15.0*
Enterprises which did not respond to the question	11.9	12.8	26.8	31.2	*24.0*

Source: Appendix 6 Table B26
*Numbers do not always total exactly because of rounding effects.

TABLE 3.15: Origin of product innovations, 2005 – 2007

Origin of product innovation (%)	Total	Industry	Services
All product innovative enterprises (number of enterprises)	**11 612*	*7 205*	*4 407*
South Africa (%)	*76.0*	*77.7*	73.1
Abroad (%)	*24.0*	*22.3*	26.7
Enterprises which did not respond to the question (%)	*0.1*	*0.0*	0.1

Source: Appendix 5 Table A7
*Numbers do not always total exactly because of rounding effects.

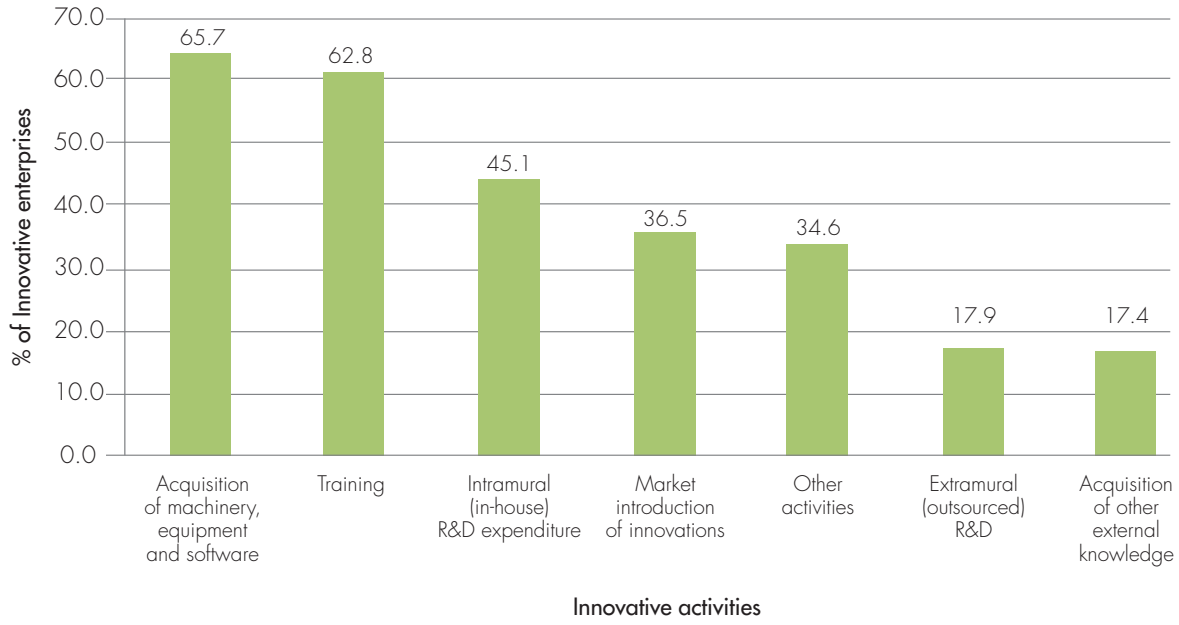
3.6 Innovation activities and expenditures

Innovation may be related to any scientific, technical, organisational, financial or commercial activities, including investment in new knowledge that leads to, or is intended to lead to, the implementation of innovations. The activities measured by the survey included, among others, the acquisition of machinery, equipment and software, training, in-house and outsourced expenditure, and the acquisition of other external knowledge.

Figure 3.9 shows that most innovative enterprises (65.7%) acquired new machinery, equipment or software as part of their innovation processes. Training was the second most important innovation activity (62.8%), and almost half (45.1%) of all innovative enterprises spent money on in-house R&D.

Innovative enterprises spent R56.9 billion on innovation activities, which represents about 1.7% of the total turnover of all enterprises in both the industrial and services sectors (Table 3.16). Expenditure on innovation activities as a percentage of the turnover of innovative enterprises in 2007 was 2.0% overall compared with 3.2% of the turnover in 2004. The industrial sector had a higher share of innovation expenditure, equivalent to 2.1% of the turnover of innovative industrial enterprises, compared to 1.9% for service enterprises.

Figure 3.9: Types of innovation activities among innovative enterprises, 2005 – 2007



Source: Appendix 5 Table A4.1

Table 3.16 indicates that in both the industrial and services sectors, the bulk of innovation expenditure was devoted to the acquisition of new machinery, equipment and software and was equivalent to about 1.0% of the turnover of all enterprises and 1.2% of the turnover of innovative enterprises. Intramural and outsourced R&D accounted for 0.6 % (data not shown) of the turnover of all enterprises and 0.7% (data not shown) of the turnover of innovative enterprises.

TABLE 3.16: Enterprises that declared innovation expenditure by sector, 2007 (year specific question)

Type of expenditure (R millions)	Total	Industry	Services	% of turnover of all enterprises
Intramural (in-house) R&D	12 098	6 719	5 379	0.4
Extramural or outsourced R&D	6 479	2 240	4 239	0.2
Acquisition of machinery, equipment and software	33 920	17 520	16 400	1.0
Acquisition of other external knowledge	4 461	538	3 923	0.1
Total	*56 959*	*27 018*	*29 941*	*1.7*
Type of expenditure (% of turnover of innovative enterprises)	**Total**	**Industry**	**Services**	
Intramural (in-house) R&D	0.4	0.5	0.3	
Extramural or outsourced R&D	0.2	0.2	0.3	
Acquisition of machinery, equipment and software	1.2	1.4	1.1	
Acquisition of other external knowledge	0.2	0.0	0.3	
Total	*2.0*	*2.1*	**1.9*	

Source: Appendix 5 Table A4.1
*Numbers do not always total exactly because of rounding effects.

International comparisons of innovation activities in innovative enterprises indicated that about 45.1% of innovative South African enterprises undertook intramural R&D, and South Africa ranked 14th when compared with 26 EU member countries in this activity (Table 3.17). South Africa ranked 19th in terms of the percentage of innovative enterprises that outsourced or engaged in extramural R&D (17.9%). Despite relatively high expenditure on the acquisition of machinery, equipment and software, South African enterprises were not as active as enterprises in other countries in these acquisitions: South Africa ranked only 16th, with 65.7% of enterprises reporting such expenditure in the country. South Africa ranked 17th in terms of the percentage of innovative enterprises engaged in the acquisition of other external knowledge (17.4%).

In Europe, Slovenia and Sweden had the highest proportion of innovative enterprises that engaged in in-house R&D, with 75.4% and 64.6% respectively of innovative enterprises conducting in-house R&D. Turkey and Bulgaria recorded the least intramural R&D activity, with 29.3% and 13.4% respectively of innovative enterprises conducting in-house R&D activities.

The survey included a question on whether intramural R&D was carried out occasionally or continuously (Figure 3.10). The Netherlands had the highest proportion (45.7%) of innovative enterprises undertaking continuous R&D, followed by Belgium (37.7%) and Sweden (34.3%). In South Africa, 19.8% of innovative enterprises undertook R&D on a continuous basis, while 21.3% of enterprises undertook R&D occasionally.

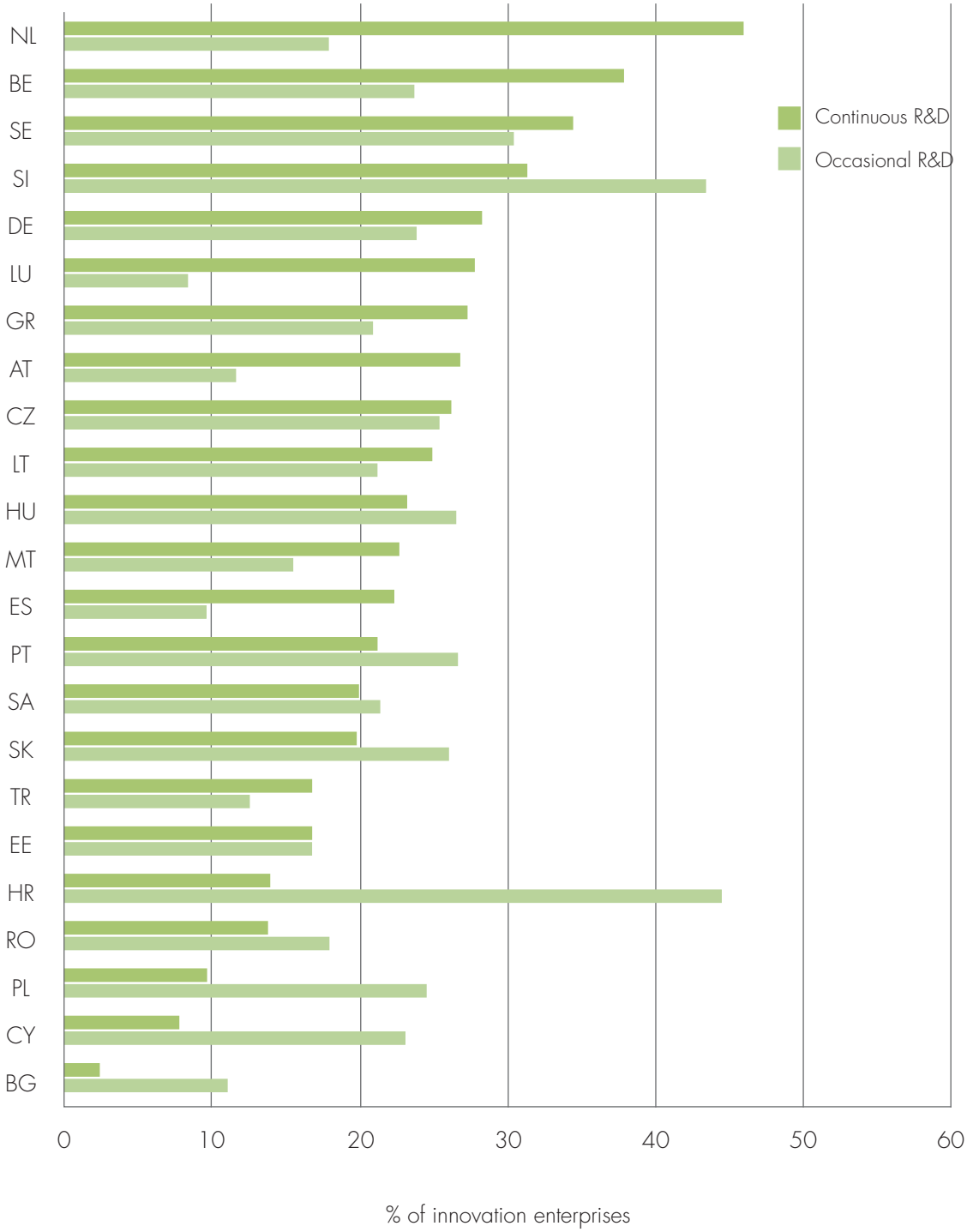
TABLE 3.17: Share of innovative enterprises by type of activity (EU member states and South Africa), 2005 – 2007

Country	Enterprises engaged in intramural R&D	Enterprises engaged in extramural R&D	Enterprises engaged in acquisition of machinery, equipment and software	Enterprises engaged in acquisition of other external knowledge
Slovenia	74.5	34.9	81.6	37.1
Sweden	64.6	26.8	62.2	35.6
Netherlands	63.5	29.8	54.3	14.5
Belgium	62.0	32.8	71.4	23.6
Croatia	58.0	33.6	87.3	27.3
Czech Republic	51.2	26.7	79.3	26.1
Hungary	49.6	19.1	73.7	17.4
Denmark	48.9	34.9	61.1	33.7
Norway	48.0	21.6	:	:
Greece	47.9	23.6	82.2	15.9
Portugal	47.7	28.1	81.9	24.5
Lithuania	45.8	26.7	73.8	26.9
Slovakia	45.7	25.2	82.1	21.1
South Africa	**45.1**	**17.9**	**65.7**	**17.4**
Ireland	44.1	13.0	54.4	27.7
Austria	38.2	21.7	63.7	27.7
Malta	37.9	7.2	51.3	15.4
Luxembourg	37.0	30.5	71.1	25.8
Poland	34.0	21.2	89.7	14.1
Estonia	33.3	22.1	89.0	24.3
Spain	31.8	17.3	36.8	:
Romania	31.6	10.6	76.0	9.9
Cyprus	30.8	42.1	99.0	60.4
Turkey	29.3	10.0	42.0	12.9
Bulgaria	13.4	8.6	72.6	19.6
Germany	:	:	:	1.0
SA Ranking (1 – 26, excluding instances where data was not available)	**14**	**19**	**16**	**17**

Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African Data: Appendix 5 Table A4.2

: = Data not available

FIGURE 3.10 Share of innovative enterprises engaged in intramural R&D continuously or occasionally (EU member states and selected countries, including South Africa), 2005 – 2007



Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African Data: Appendix 6 Table B29

3.7 Financial support for innovation activities

National funding agencies, such as the National Research Foundation (NRF) which housed the Innovation Fund and the Technology and Human Resources for Industry Programme (THRIP), appeared to have a stimulatory effect on innovation activities. About 2.5% of innovators in industry received funding for innovation activities from these national funding agencies (Table 3.18), while in the services sector 0.4% of innovative enterprises received funding from such sources. National government provided funding to a further 0.7% of innovative enterprises in the industrial sector and 1.7% in the services sector. Altogether 5.2% of innovative industrial enterprises and 2.5% of all innovative services enterprises received public funding for their innovation activities between 2005 and 2007. In total 4.1% of innovative enterprises received funding for their innovation activities from government sources.

When considered in an international context, however, South Africa appears to have supported relatively few enterprises in their innovation activities. South Africa appears to have provided the lowest percentage of public funds to innovative enterprises (Figure 3.11). Of the 22 countries that supplied such data, five countries provided public funding for innovation to more than 25% of innovative enterprises.

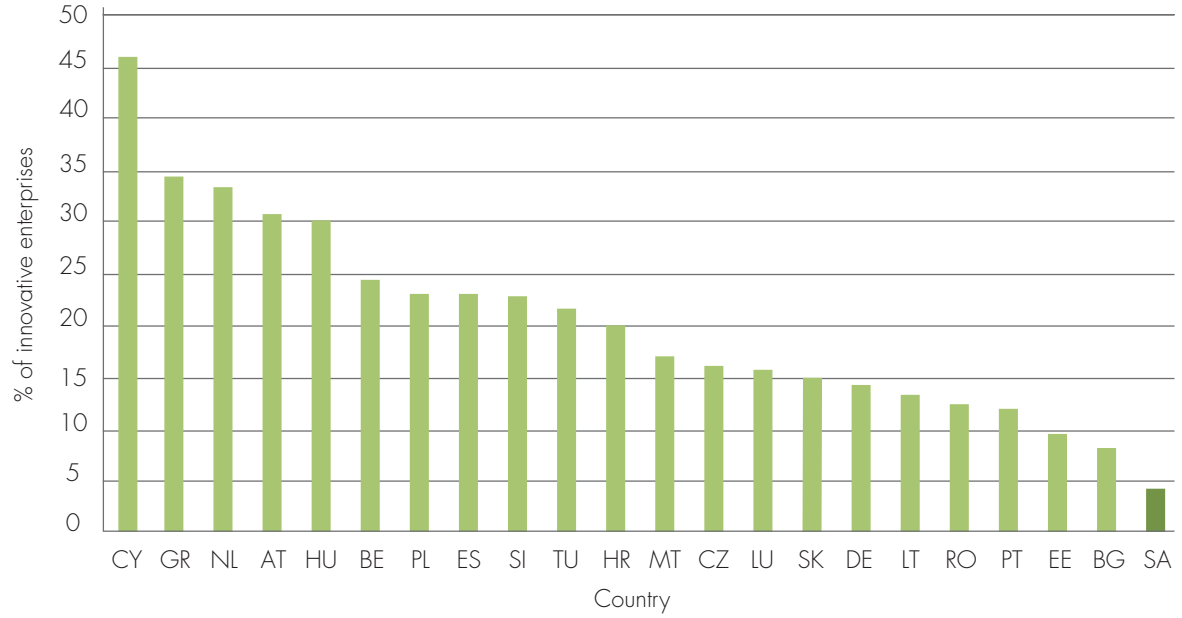
In the EU, many countries offer tax incentives for R&D and innovation or have a strong history of direct funding of R&D and innovation through grants and subsidies at both national and EU levels. The EU Framework Programme for Research and Technological Development is regarded as a major tool for supporting the creation of the European Research Area (with the 7th Framework Programme now in place for the period 2007 – 2013) and should be a relatively strong source of funding for innovation. In the CIS 4, however, the highest percentages of innovative enterprises to indicate that they received EU funding for their innovation activities were Greece (19.7%), Austria (9.3%), Finland (8.4%) and Denmark (6.5%). Of these enterprises receiving EU funding, relatively few received funding from the 5th or 6th Framework Programmes: 7.8% in Greece, 2.6% in Austria, 4.3% in Finland and 3.4% in Denmark (European Communities 2007b).

TABLE 3.18: Percentage of innovative enterprises that received financial support for innovation activities from government sources 2005 – 2007

Percentage of innovative enterprises (%)	Total (%)	Industry (%)	Services (%)
Source of financial support			
Metros and municipalities	*0.0*	0.0	0.1
Provincial government	*0.0*	0.0	0.0
National government	*1.2*	0.7	1.7
National funding agencies	*1.6*	2.5	0.4
Foreign government/public sources	*1.2*	2.0	0.3
Total	**4.1*	*5.2*	*2.5*

Source: Appendix 5 Table A19
*Numbers do not always total exactly because of rounding effects.

FIGURE 3.11: Share of innovative enterprises that received public funds (EU member states and selected countries, including South Africa), 2005 – 2007



Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Table A19

Direct measures of innovation support are likely to lead to the development of relationships between government, industry and third parties such as higher education institutions. In South Africa, the combined funding offered by the Innovation Fund, THRIP and the Support Programme for Industrial Innovation (SPII) is less than R500 million, not all of which goes to the business sector. Considering that the 2008 innovation survey showed that enterprises spent about R56.9 billion on innovation activities, the public funding available for innovation in industry represents less than 1% of business expenditure on innovation activities. Public funding for R&D activities in the business sector appears to be far better supported, and the 2007/08 R&D Survey reported that 21.7% of business R&D expenditure was supported by government sources.

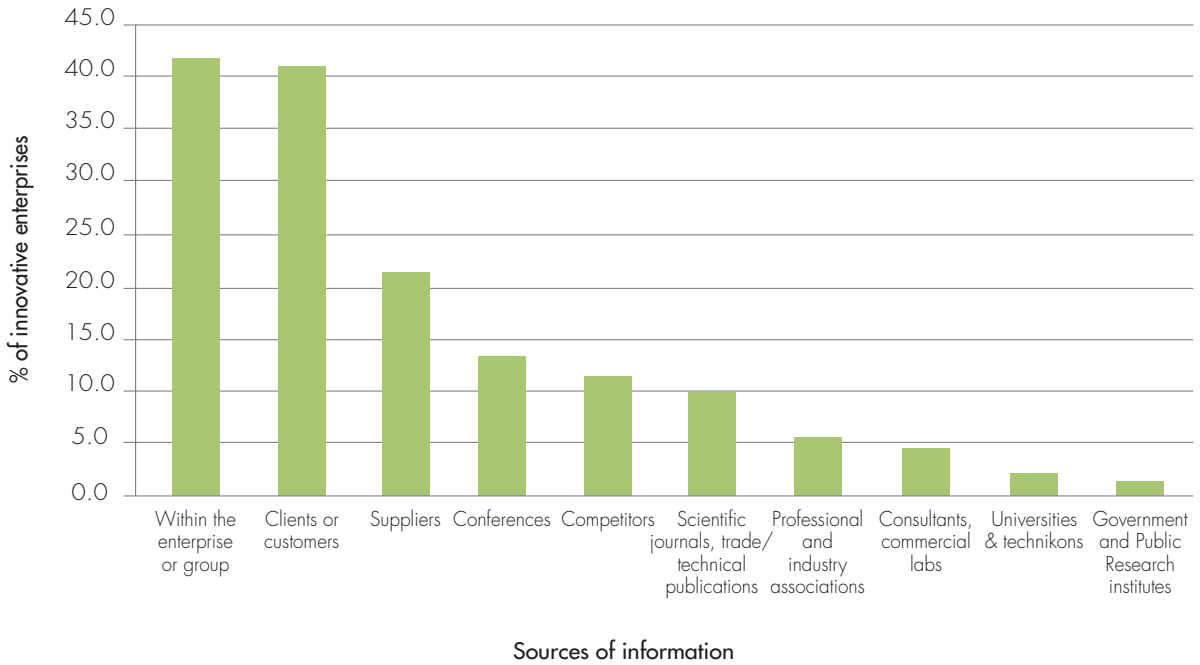
The results of the 2008 innovation survey also suggest that the majority of innovative enterprises in South Africa still have limited, if any, access to public funding to support their innovation activities. An analysis of these findings indicates that in order to provide public funding to 20% of innovative enterprises, the South African government would have to fund a total of 2 986 enterprises – 251 enterprises from the largest size group, 660 medium-sized enterprises, 1 022 small enterprises and 1 053 very small enterprises. Currently about 11.4% of enterprises in the large enterprise group, 13.5% medium-sized enterprises, 0.3% small enterprises and 0.1% very small enterprises are funded from public sources (see Appendix 6 Table B19). Slightly higher percentages of innovative enterprises received funds from South African government sources than reported in the 2005 innovation survey.

3.8 Sources of information and co-operation for innovation activities

About 42% of all innovative enterprises rated sources of information within the enterprise as 'highly important' for innovation activities (Figure 3.12). 'Clients and customers' as external market sources were rated as 'highly important' by 41.2% of innovative enterprises, followed by 'suppliers' (21.3%), 'conferences, trade fairs and exhibitions' (13.3%) and 'competitors' (11.4%). 'Universities and Technikons', as well as 'government', appeared to be relatively minor sources of information for innovation, with only 2.1% and 1.5% of enterprises respectively rating them as 'highly important'. This finding is consistent with the results of innovation surveys in other countries.

Table 3.19 shows the 'highly important' sources of information for innovation in enterprises in various countries, by different sources of information. There was a fair amount of variation between countries regarding the most important sources of information for innovation, although some of the newer EU members appeared to rate most sources of information for innovation fairly low. Cyprus, for instance, appeared high on the list for 'its own' and 'market sources' but low on the list for 'universities' and 'public research institutes'. It is difficult to conclude that there was any discernable pattern distinguishing particular groups of countries. However, enterprises tended to rate 'their own' sources of information and 'suppliers' and 'customers' quite highly. 'Consultants', 'universities' and 'public research institutes' were generally rated quite low, which calls into question some of the current thinking about the importance of industry, university and public sector linkages for innovation activities within national systems of innovation. In this regard, Eurostat has raised the question of why innovative enterprises do not make more use of knowledge generated by universities and public research institutes and asked whether the research generated by such institutions is too theoretical to be applied for industrial purposes, or whether public research is too expensive for industry to afford (European Communities 2007c).

FIGURE 3.12 Sources of information for innovation rated as 'highly important' by innovative enterprises, 2005 – 2007



Source: Appendix 5 Table A11

TABLE 3.19: 'Highly important' sources of information for innovation in innovative enterprises (EU member states and selected countries including South Africa), 2005 – 2007

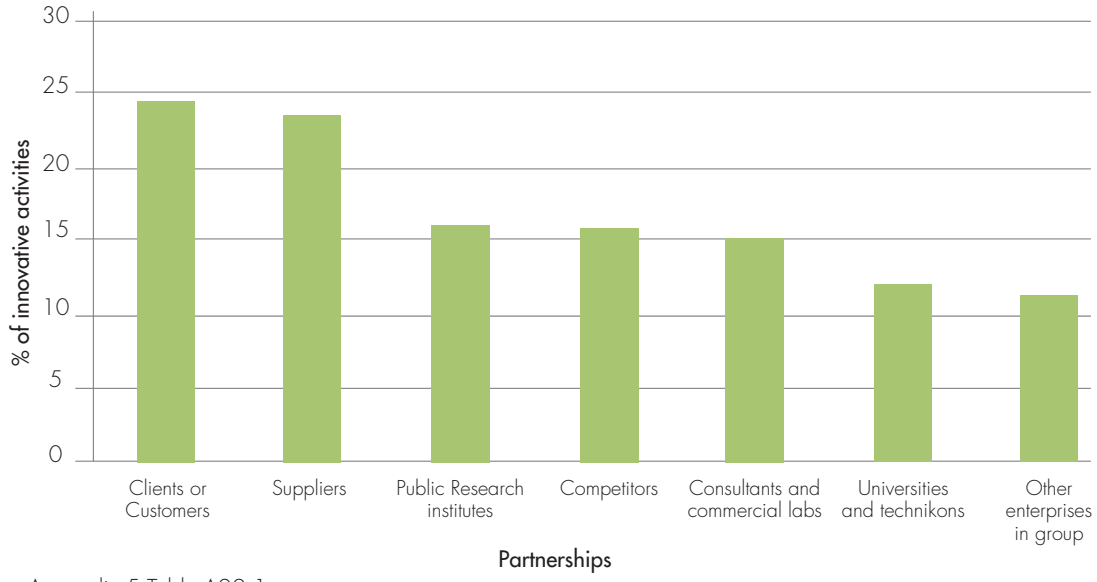
Percentage of enterprises (%)	Internal source	External: market sources			External: institutional sources			External: other sources		
Country	Sources within your enterprise or enterprise group	Suppliers of equipment, materials, components or software	Clients or customers	Competitors or other enterprises in your sector	Consultants, commercial labs or private R&D institutes	Universities or other higher education institutions	Government or Public Research institutes	Conferences, trade fairs, exhibitions	Scientific journals and trade/technical publications	Professional and industry associations
Cyprus	92.6	80.5	49.5	35.7	54.4	12.7	15.0	35.7	34.7	19.7
Luxembourg	65.5	33.0	36.5	21.8	9.6	5.8	5.7	21.8	17.0	17.0
Austria	60.1	28.0	47.6	20.0	5.1	8.1	4.1	20.0	11.0	8.6
Slovenia	57.1	29.8	44.8	20.1	7.3	5.8	2.1	20.1	10.0	6.0
Belgium	53.3	28.2	25.1	9.6	6.1	4.0	2.6	9.6	6.1	6.2
Poland	53.0	20.0	29.3	17.9	6.2	4.1	6.1	17.9	13.4	5.5
Turkey	46.3	29.8	36.6	18.2	9.3	5.6	4.4	18.2	15.3	9.5
Portugal	46.0	26.9	32.8	13.5	5.8	4.7	2.4	13.5	10.7	10.1
Slovakia	44.0	23.0	28.7	12.7	5.0	1.1	0.9	12.7	7.7	0.9
Croatia	43.6	27.7	35.2	15.3	4.8	3.5	2.0	15.3	11.3	4.5
Spain	43.4	25.1	16.5	8.8	5.7	3.2	4.4	8.8	4.6	3.8
Netherlands	42.9	18.7	26.7	8.3	3.1	2.4	2.3	8.3	3.5	3.5
Romania	41.8	34.0	33.0	19.3	6.1	3.5	2.8	19.3	22.3	5.7
South Africa	**41.7**	**21.3**	**41.2**	**11.4**	**4.6**	**2.1**	**1.5**	**13.3**	**10.1**	**5.6**
Hungary	40.5	21.5	33.9	19.8	9.3	7.6	2.4	19.8	7.4	4.2
Malta	39.5	23.1	25.6	14.4	5.1	2.6	1.5	14.4	5.6	1.5
Czech Republic	37.4	24.8	33.7	15.9	5.1	2.9	1.5	15.9	6.1	2.5
Bulgaria	32.2	28.3	27.5	16.6	7.4	5.0	2.7	16.6	13.6	7.9
Estonia	31.0	24.6	17.5	8.9	3.7	2.1	0.9	8.9	4.5	2.5
Lithuania	29.9	22.1	24.4	8.5	11.1	8.1	0.4	8.5	12.4	2.7
Greece	7.3	12.7	16.1	25.9	15.1	9.3	8.6	25.9	20.3	21.5
SA Ranking (1 – 21)	14	18	3	4	8	7	14	4	13	9

Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database Source of South African data: Appendix 5 Table A11

3.9 Co-operation partners for innovation activities

South African enterprises were well attuned to both the demand and supply aspects of the market. Figure 13.3 shows that the most important collaborative partnerships for innovation were between enterprises and their clients or customers, which comprised 24.4% of collaborative partnerships. Collaborative efforts between enterprises and their suppliers were at 23.6%. If one compares co-operation partners in industry and services (Table 3.20), one finds that industrial enterprises co-operate mostly with 'clients or customers' (31.4%) and 'suppliers' (30.0%). However the most important collaboration partner in the services sector was 'government and public research institutes' (16.0%) In total, 16.1% of innovative enterprises collaborated with 'public research institutes' and a further 15.9% also collaborated with their 'competitors'. 'Universities and Technikons' were rated as 'highly important' collaborative partners by 12.1% of innovative enterprises.

FIGURE 3.13: Innovative collaborative partnerships by type of partner, 2005 – 2007



Source: Appendix 5 Table A22.1

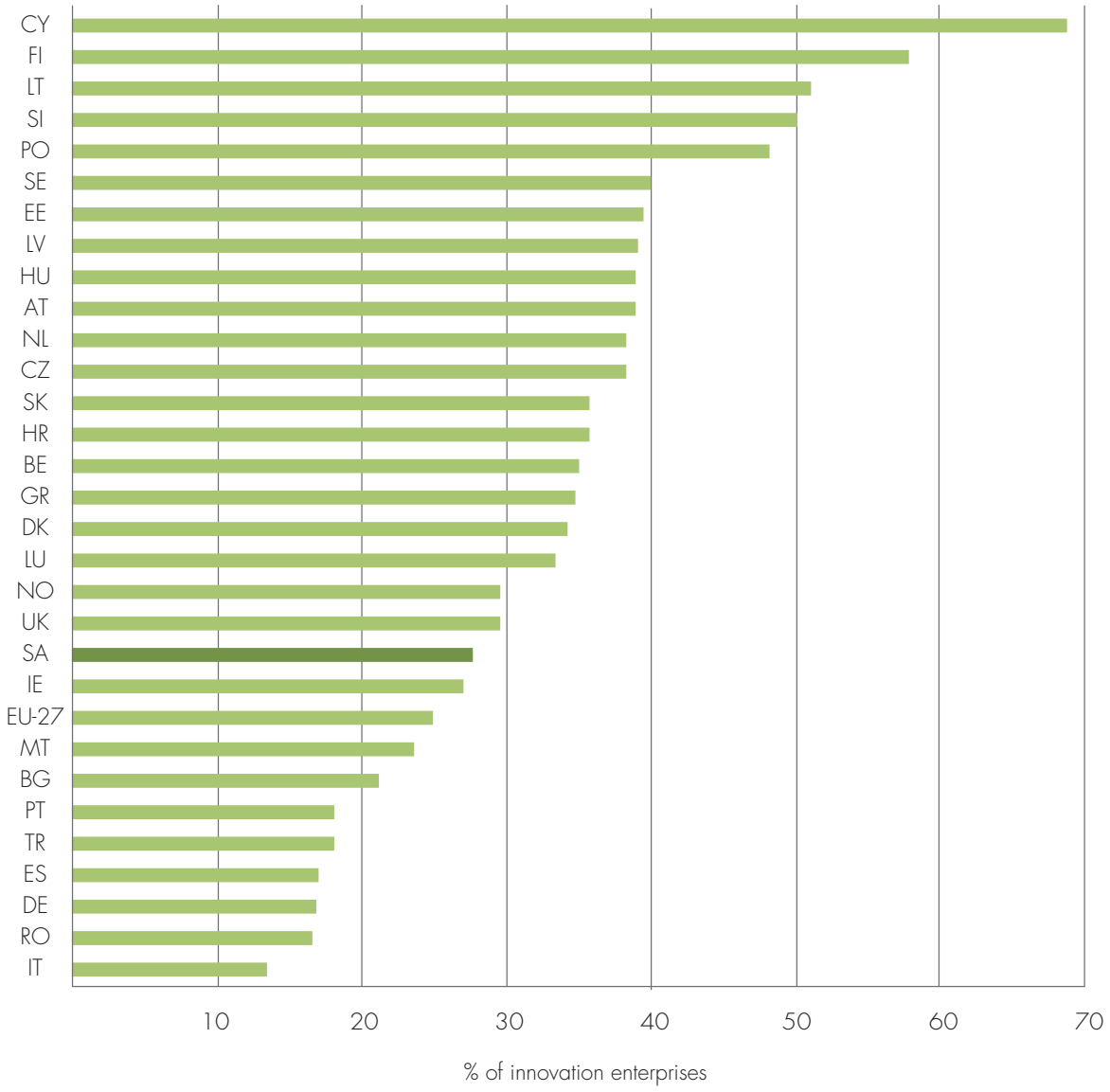
TABLE 3.20: Collaborative partnerships for innovation activities by type of partner (%), 2005 – 2007

Percentage of enterprises (%)	Total (%)	Industry (%)	Services (%)
Collaborative partnerships			
Clients or customers	24.4	31.4	15.1
Suppliers of equipment, materials, components or software	23.6	30.0	15.1
Government or Public Research institutes	16.1	16.1	16.0
Competitors or other enterprises in your sector	15.9	18.5	12.4
Consultants, commercial labs or private R&D institutes	15.3	21.0	7.8
Universities or Technikons	12.1	16.2	6.7
Other enterprises within your enterprise group	11.5	14.1	8.0

Source: Appendix 5 Table A22.1

Figure 3.14 shows that 27.6% of innovative enterprises in South Africa had co-operation partners for innovation activities. In the EU by comparison, the proportion of innovative enterprises that engaged in co-operative partnerships ranged from 13.5% in Italy to 68.8% in Cyprus (Table 3.21). For the EU-27, about a quarter (24.9%) of all innovative enterprises engaged in some sort of co-operation on innovation. Lithuania, Slovenia, Finland, Sweden, Denmark and Poland were among the countries that had higher proportions of co-operative linkages than South Africa. Of the 30 countries represented in Table 3.21, South Africa ranked 21st in terms of co-operative linkages. Germany, Romania and Italy appeared to have the lowest rates of co-operative partnerships in innovative enterprises. Cyprus, Finland, Lithuania and Slovenia were the only countries where more than half (an average of 56.9%) of innovative enterprises reported co-operative partners in innovation.

FIGURE 3.14: Share of enterprises with co-operation partners by country (EU member states and selected countries including South Africa), 2005 – 2007



Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Table A22.1

TABLE 3.21: Different types of co-operation partners of enterprises by country, as a percentage of innovative enterprises (EU member states and selected countries including South Africa), 2005 – 2007

Country	All types of co-operation	Other enterprises within your enterprise group	Competitors or other enterprises of the same sector	Clients or customers	Suppliers of equipment, materials, components or software	Universities or other higher education institutions	Government or Public Research institutes	Consultants, commercial labs, or private R&D institutes
Cyprus	68.8	18.7	27.9	39.2	62.4	10.9	12.5	44.8
Finland	57.7	25.5	35.6	52.6	50.5	36.0	27.9	37.1
Lithuania	51.2	25.2	18.3	31.0	40.4	18.8	8.7	22.8
Slovenia	50.2	18.8	24.5	38.0	42.7	22.7	15.0	23.0
Poland	48.2	13.3	12.4	23.9	37.8	8.9	8.2	10.9
Sweden	40.0	16.2	:	25.2	29.1	15.6	:	20.7
Estonia	39.5	20.6	16.0	24.6	22.8	9.3	5.0	10.7
Latvia	39.1	14.5	20.7	28.6	32.8	16.9	14.1	18.1
Hungary	39.0	8.3	12.1	16.2	25.6	18.1	6.1	15.3
Austria	38.9	16.0	14.0	23.3	22.8	16.1	9.3	14.4
Netherlands	38.3	17.3	10.7	20.7	30.2	11.2	7.7	14.1
Czech Republic	38.3	14.4	13.1	25.2	29.7	11.2	6.8	14.5
Slovakia	35.8	13.8	22.1	25.7	31.7	13.2	10.1	17.7
Croatia	35.6	12.4	17.8	25.3	29.1	13.8	9.8	14.6
Belgium	35.0	14.2	8.9	18.2	26.1	13.7	9.1	16.5
Greece	34.8	5.3	11.3	15.2	25.4	12.6	9.4	12.2
Denmark	34.2	11.1	10.2	19.7	20.9	9.7	3.0	8.5
Luxembourg	33.3	15.6	17.2	22.0	23.8	8.4	9.6	13.2
Norway	29.6	7.3	6.5	15.6	17.5	10.8	9.9	15.1
United Kingdom	29.5	15.9	9.6	20.5	19.8	8.9	6.6	10.5
South Africa	**27.6**	**11.5**	**15.9**	**24.4**	**23.6**	**12.1**	**16.1**	**15.3**
Ireland	27.0	13.9	4.4	13.7	17.2	6.8	4.5	8.1
European Union (27 countries)	24.9	:	:	:	:	:	:	:
Malta	23.6	11.8	4.6	12.8	16.9	3.6	1.5	7.7
Bulgaria	21.2	3.2	8.6	13.1	15.7	5.4	5.0	6.7
Portugal	18.1	5.2	5.6	9.6	11.7	8.3	4.5	7.4
Turkey	18.0	9.5	6.8	10.7	13.0	6.4	4.4	8.9
Spain	17.0	3.7	3.0	4.7	8.7	4.9	5.4	4.1
Germany (including former GDR from 1991)	16.7	:	:	:	:	:	:	:
Romania	16.5	3.5	6.8	10.8	13.6	5.8	4.6	6.4
Italy	13.5	:	:	:	:	:	:	:
SA Ranking (1-31, excluding instances where data was not available)	**21**	**19**	**10**	**11**	**16**	**12**	**2**	**9**

Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Table A22.1
: = Information not available

3.10 Effects of innovation

The innovation survey included a question that required innovative enterprises to rank the importance of various market and operational outcomes resulting from both product and process innovations. Increasing the range of goods and services was cited as having a 'highly important' effect on innovation by about 31% of innovative enterprises (Table 3.22), and this was more important for industrial enterprises (35.2%) than for service enterprises (26.0%). 'Improved quality of goods and services' was also an important outcome for 30.7% of enterprises (29.0% of industrial and 32.9% of service enterprises), while 'entering new markets or increasing market share' appeared rather less important and was cited as a 'highly important' outcome by only 17.0% of innovative enterprises (25.2% of industrial enterprises, but only 6.1% of service enterprises). 'Increased capacity of production or service provision' was cited as the most important effect of process innovation by 25.6% of innovative enterprises, followed by 'improved flexibility of production or service provision' (15.8%). Other 'highly important' effects of innovation cited were 'meeting government regulatory requirements' (cited by 15.7% of innovators) and 'reduced environmental impacts or improved health and safety' (6.3%).

TABLE 3.22: 'Highly important' effects of innovation on outcomes for innovative enterprises, 2005 – 2007

Percentage of enterprises (%)	Total	Industry	Services
Product outcomes			
Increased range of goods and services	*31.2*	35.2	26.0
Entered new markets or increased market share	*17.0*	25.2	6.1
Improved quality of goods or services	*30.7*	29.0	32.9
Process outcomes			
Improved flexibility of production or service provision	*15.8*	20.2	9.9
Increased capacity of production or service provision	*25.6*	35.0	13.2
Reduced labour costs per unit output	*8.9*	11.7	5.1
Reduced materials and energy per unit output	*11.5*	12.6	10.1
Other outcomes			
Reduced environmental impacts or improved health and safety	*6.3*	6.3	6.2
Met governmental regulatory requirements	*15.7*	16.6	14.6

Source: Appendix 5 Table A8.2

Enterprises might have been expected to become more innovative in response to the tighter environmental regulations, health and safety requirements in the workplace and the introduction of legislation to promote black economic empowerment (BEE) and employment equity. However, the survey results indicated a decrease in this indicator from the previous survey, possibly implying that enterprises were already complying with legislation.

TABLE 3.23: Percentage of enterprises engaged in innovation activity that cited the various effects of innovation as 'highly important' (selected countries and South Africa), 2005 – 2007

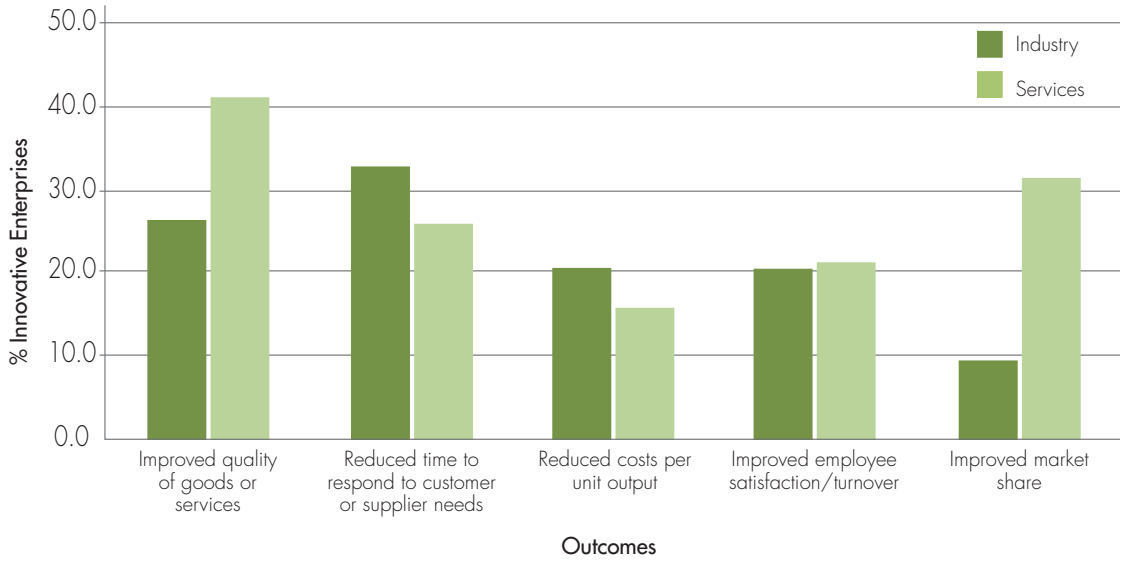
Percentage of enterprises (%)	Product-oriented effects			Process-oriented effects				Other effects	
Country	Increased range of goods and services	Entered new markets or increased market share	Improved quality in goods or services	Improved flexibility of production or service provision	Increased capacity of production or service provision	Reduced labour costs per unit output	Reduced materials and energy per unit output	Reduced environmental impacts or improved health and safety	Met regulation requirements
Luxembourg	57.7	45.1	62.1	35.2	33.6	12.9	6.8	12.9	28.5
Cyprus	45.4	38.0	57.5	69.8	62.4	29.2	19.9	38.0	56.1
Netherlands	44.8	38.8	44.0	31.8	31.6	16.6	10.5	11.7	14.6
Austria	39.4	33.7	48.7	30.0	27.8	11.9	9.7	13.4	18.5
Czech Republic	39.3	28.8	38.2	25.4	26.1	18.2	14.2	13.8	7.2
Croatia	39.1	32.8	52.3	34.5	32.2	19.9	15.1	18.0	31.5
Turkey	38.3	32.6	49.5	39.4	39.4	18.0	10.2	21.6	28.8
Bulgaria	38.2	30.1	38.9	21.0	21.7	15.9	13.2	20.9	25.3
Slovakia	38.1	23.1	41.6	28.5	27.2	8.0	10.8	13.8	13.4
Romania	37.0	29.4	41.7	28.2	34.1	18.3	14.8	23.7	20.9
Poland	36.1	26.9	38.1	20.8	25.7	13.8	11.6	18.5	24.7
Portugal	34.1	25.4	44.3	31.2	36.5	22.4	15.0	24.1	25.6
Sweden	32.9	24.3	34.2	18.4	23.1	17.0	:	14.0	17.8
Lithuania	32.4	28.0	34.4	25.0	30.5	10.7	8.5	9.9	25.2
Hungary	32.4	26.2	37.2	21.9	22.3	6.2	7.2	13.6	19.8
South Africa	**31.2**	**17.0**	**30.7**	**15.8**	**25.6**	**8.9**	**11.5**	**6.3**	**15.7**
Estonia	29.8	25.7	27.2	20.0	20.5	14.3	7.8	8.4	6.8
Latvia	27.9	15.8	26.6	16.4	17.3	6.2	5.4	6.3	13.9
Malta	27.7	15.9	31.3	21.0	18.5	11.8	7.7	8.7	20.0
Spain	25.2	18.6	33.5	22.6	27.4	12.9	8.5	13.4	19.8
Denmark	18.6	15.8	16.6	15.3	18.8	11.5	7.3	5.3	9.2
Finland	16.5	15.5	17.0	14.4	15.3	10.7	5.2	7.2	9.6
Greece	9.1	11.6	5.8	8.3	9.2	26.2	20.7	12.9	11.3

Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Table A8.2

International comparisons on the 'Highly important' effects of product innovations are shown in Table 3.23. In terms of product-oriented effects, increasing the range and improving the quality of goods and services were the most important outcomes of innovation activities for most countries. 'Improved flexibility', and 'increased capacity of production or service provision' were considered the most important process-oriented effects. 'Reducing environmental impacts' and meeting regulatory requirements were generally considered very important outcomes of innovation.

Figure 3.15 shows that innovative enterprises in both the industrial and services sectors that introduced organisational innovations reported 'improved quality of goods and services' as 'highly important' (46% and 32% respectively). This was followed by reducing the time to respond to customer or supplier needs, which approximately 31% of all innovative enterprises rated as 'highly important'. Only 16% of innovators considered reducing costs per unit output to be a 'highly important' outcome of organisational innovation.

FIGURE 3.15: Innovative enterprises that introduced organisational innovation and rated various outcomes as 'highly important', 2005 – 2007



Source: Appendix 5 Table A18

3.11 Factors hampering innovation activities

Up to 17.3% of innovative enterprises experienced problems with certain innovation activities and reported that these activities were seriously delayed during the period 2005 – 2007 (Table 3.24). Some 17.3% of innovative enterprises reported abandoning innovation projects during the concept stage, while 9.7% abandoned innovation projects that had already begun.

TABLE 3.24: Enterprises with innovation activity that cited problems with their innovation activity, 2005 – 2007

Number of innovative enterprises	Total	Industry	Services
Cited problems			
Abandoned in the concept stage	*2 583	1 387	1 195
Abandoned after the activity or project was begun	1 444	1 121	323
Seriously delayed	2 585	1 694	891
Percentage of innovative enterprises (%)			
Cited problems			
Abandoned in the concept stage	17.3	16.3	18.7
Abandoned after the activity or project was begun	9.7	13.1	5.0
Seriously delayed	17.3	19.9	13.9

Source: Appendix 5 Table A12
*Numbers do not always total exactly because of rounding effects.

Enterprises were asked to rate the degree to which a number of specified factors hampered their innovation activities during the period 2005 – 2007. Table 3.25 shows that 27.8% of all enterprises indicated that the development of innovative activities within their enterprises was hampered or restrained by a 'lack of funds within the enterprise or group'. The second most-cited factor was that the cost of innovation was perceived as being too high (23.8%), followed by markets being dominated by established enterprises (21.4%).

TABLE 3.25: 'Highly important' factors that hampered innovation activities of all enterprises, 2005 – 2007

				**Total (%)	
Percentage of enterprises (%)	Industry (Total %)	Services (Total %)	*Total (%)	Innovative	Non-innovative
Hampering factors					
Cost factors					
Lack of funds within your enterprise or group	35.3	18.8	27.8	*28.7*	*26.1*
Lack of finance from sources outside your enterprise	22.1	7.6	15.4	*16.4*	*13.6*
Innovation costs too high	30.8	15.5	23.8	*26.6*	*18.5*
Knowledge factors					
Lack of qualified personnel	20.7	9.8	15.8	*17.5*	*12.6*
Lack of information on technology	10.7	3.4	7.4	*7.7*	*6.9*
Lack of information of markets	9.1	5.8	7.6	*9.6*	*3.7*
Difficulty in finding co-operation partners	11.6	4.7	8.4	*9.8*	*5.9*
Market factors					
Market dominated by established enterprises	21.0	21.9	21.4	*19.4*	*25.1*
Uncertain demand for innovative goods or services	16.5	7.6	12.4	*9.5*	*17.8*
Reasons not to innovate					
No need due to prior innovations	5.5	5.3	5.4	*2.1*	*11.6*
No need because of no demand for innovations	5.4	5.0	5.2	*1.8*	*58.4*

*Total includes all enterprises
** Total = percentage innovative or non-innovative enterprises in both services and industry
Source: Appendix 5 Tables A13.1, A13.2, A13.3 and A13.4

Table 3.26 provides more detail on the factors hampering innovation activities in innovative and non-innovative enterprises in the industrial and services sectors. Innovative industrial enterprises appeared to be most hampered in their innovation activities by the 'lack of funds within their enterprise or group' (37.5%), while most non-innovative enterprises indicated that there was no demand for innovation (58.3%). Both innovative and non-innovative enterprises in the services sector tended to cite the domination of established enterprises in their market as hampering their innovation activities. The 2005 innovation survey reported similar findings.

TABLE 3.26: 'Highly important' factors that hampered innovation activities of innovative and non-innovative enterprises, 2005 – 2007

Percentage of enterprises (%)	Industry (%)		Services (%)		Total (%)	
Hampering factors	Innovative	Non-Innovative	Innovative	Non-Innovative	Innovative	Non-Innovative
Cost factors						
Lack of funds within your enterprise or group	37.5	30.6	16.9	21.8	*28.7*	*26.1*
Lack of finance from sources outside your enterprise	23.2	19.7	7.4	7.8	*16.4*	*13.6*
Innovation costs too high	33.7	24.4	17.1	12.9	*26.6*	*18.5*
Knowledge factors						
Lack of qualified personnel	22.6	16.5	10.6	8.9	*17.5*	*12.6*
Lack of information on technology	11.7	8.5	2.3	5.3	*7.7*	*6.9*
Lack of information of markets	11.4	3.9	7.1	3.6	*9.6*	*3.7*
Difficulty in finding co-operation partners	13.0	8.6	5.6	3.2	*9.8*	*5.9*
Market factors						
Market dominated by established enterprises	17.8	27.9	21.6	22.5	*19.4*	*25.1*
Uncertain demand for innovative goods or services	15.4	18.9	1.7	16.8	*9.5*	*17.8*
Reasons not to innovate						
No need due to prior innovations	3.0	11.0	1.0	12.1	*2.1*	*11.6*
No need because of no demand for innovations	2.9	54.6	0.5	62.1	*1.8*	*58.4*

Source: Appendix 5 Tables A13.1, A13.2, A13.3 and A13.4

FIGURE 3.16: Enterprises with innovation activity that made use of intellectual property rights (IPR), 2005 – 2007

Source: Appendix 5 Tables A15 and A16

3.12 Intellectual property rights

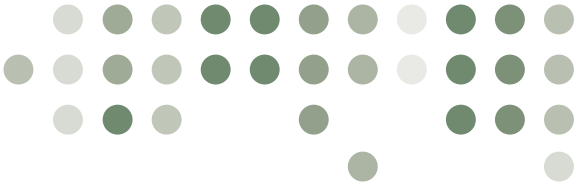
About 11% of innovative enterprises registered a trademark between 2005 and 2007, while about 5% claimed a copyright (Figure 3.16). A total of 3.7% of innovative enterprises secured a patent in South Africa, while 2.3% applied for a patent outside South Africa. About 3.5% of innovative enterprises granted intellectual property rights originating from their own innovation activities to third parties.

Table 3.27 shows the percentage of innovative and non-innovative enterprises that used protection methods for intellectual property. The data showed that innovative enterprises used various protection methods more often than non-innovative enterprises. In Turkey, 37.2 % of innovative enterprises applied for patents, followed by 19.5% in Austria and 18.2 % in Norway. In South Africa, only 2.3% of innovative enterprises 'applied for a patent outside South Africa', while 3.7% of innovative enterprises 'secured a patent' at the South African patent office (see Appendix 5 Table A15.2). Turkey had the highest proportion of innovative enterprises registering a trademark (42.7%), while the corresponding South African figure was only 11.3%. The leaders in registering industrial designs were enterprises in Malta (18.5% of innovative enterprises); by comparison, only 4.3% of innovative South African enterprises 'registered an industrial design'. Innovative enterprises in Norway took the lead in claiming copyright (12.9%), compared with only 5.1% in South Africa.

TABLE 3.27: Protection methods for intellectual property used by innovative and non-innovative enterprises by country (selected countries and South Africa), 2005 – 2007

Percentage of enterprises (%)	Innovative (%)				Non-Innovative (%)			
Country	Claimed copyright	Registered an industrial design	Applied for a patent	Registered a trademark	Claimed copyright	Registered an industrial design	Applied for a patent	Registered a trademark
Norway	12.9	7.9	18.2	23.3	1.5	1.6	5.6	2.2
Turkey	11.4	15.7	37.2	42.7	15.5	3.0	19.0	3.7
Luxembourg	9.8	9.1	11.6	22.4	3.6	4.0	6.8	2.1
Ireland	8.9	4.2	12.8	12.6	0.7	:	2.4	0.6
Austria	7.1	15.3	19.5	21.8	0.8	1.5	5.1	1.0
Malta	6.7	18.5	5.6	3.6	:	2.2	:	:
Slovakia	6.7	7.3	2.9	16.5	0.6	0.4	5.5	1.0
Greece	6.0	5.2	4.6	25.3	:	0.3	6.8	1.0
Poland	5.7	4.3	5.2	16.6	0.5	0.8	4.0	0.9
Croatia	5.1	7.0	4.3	15.8	0.2	0.9	3.1	0.4
South Africa	**5.1**	**4.3**	**2.3**	**11.3**	**0.6**	**0.1**	**0.7**	**3.1**
Netherlands	4.9	5.1	15.1	18.6	1.8	0.7	5.0	1.8
Czech Republic	4.1	18.1	5.5	8.7	0.2	5.8	0.5	0.5
Cyprus	3.7	1.6	0.6	10.5	:	:	:	:
Romania	3.4	7.0	5.6	15.3	0.9	0.8	2.5	0.2
Estonia	2.7	16.6	4.4	2.0	0.3	5.1	0.8	0.6
Hungary	2.0	11.2	4.8	2.5	0.5	2.0	0.4	0.4
Bulgaria	1.9	4.4	5.6	13.2	0.9	0.5	3.2	0.4
Belgium	1.9	3.8	6.8	9.6	0.8	0.2	2.4	0.3
Lithuania	1.8	3.8	4.7	19.2	0.7	0.1	4.2	0.3
Portugal	1.5	2.2	4.7	20.3	0.5	0.3	6.7	0.3
Spain	1.2	7.8	7.1	18.3	0.0	1.3	4.8	0.2
SA Ranking (1-22, excluding instances where data was not available)	**11**	**17**	**21**	**16**	**12**	**20**	**18**	**2**

Note: All EU data are for the reference period 2004 – 2006
Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database
Source of South African data: Appendix 5 Table A16
: = data not available



CHAPTER 4

CONCLUSIONS AND POLICY RECOMMENDATIONS

The Innovation Survey 2008 is South Africa's second innovation survey based on a stratified random sample from the official Business Register of Stats SA. Several conclusions and policy recommendations were published in the 2005 innovation survey report. Most of these are relevant to the findings of the current 2008 innovation survey and some are repeated here in modified form with additional observations.

Although a relatively low response rate was achieved, the survey's findings can be considered as representative of the business sector in South Africa. Some care, however, must be taken in arriving at policy conclusions based solely on these two surveys without observing the broader trends in the real economy. The international comparisons arising from the surveys are useful in understanding the relative performance of countries and the impact of various policies in different settings. Similarly, the micro-data analyses that are possible using these data may reveal salient issues relating to innovation performance in South Africa. Much richness in the analysis comes from having undertaken an internationally comparable survey, which can be readily compared with results from many other countries.

It is widely held that innovation is a primary driver of economic growth. The main reason for conducting innovation surveys in various countries is that policymakers seek information on how to further stimulate economic growth. The concept of R&D and its measurement in R&D surveys is generally better understood than the innovation concept. Innovation is a "complex, dynamic and nonlinear"* activity which makes its measurement a challenging and continuous learning process. This is readily acknowledged by the experienced practitioners who run national R&D and innovation surveys and participate in the meetings, task teams and discussion groups of the OECD National Experts on Science and Technology Indicators (NESTI). A useful outcome of innovation surveys is that they provide common ground for discussion on issues affecting innovation in a country, and these discussions help guide further understanding of the dynamics and processes of innovation.

Despite the best intentions of governments to stimulate innovation with funding, public funds do not appear to have a great deal of penetration into the activities of innovative enterprises in South Africa. This could be a result of innovations being part of successful enterprises' business activities, in that competitive enterprises are not keen to seek public funds because this would disclose strategic information to others. Enterprises appear to be more open about engaging in publicly funded R&D where the application of activities is less clear to those outside the business. Perhaps current public funding programmes for innovation in South Africa could be intensified, better publicised and aimed at establishing more trusting relationships between the funders and performers of innovation activities.

*Gault, F. Innovation Strategies for a Global Economy: Development, Implementation, Measurement and Management. Ottawa, ON, Canada: International Development Research Centre. 2010.

Innovation is no longer regarded as an outcome resulting only from the performance of R&D; more commonly, innovation outcomes are the result of a variety of non-R&D activities and expenditures. Activities leading to innovation may include the acquisition of machinery, equipment, software and knowledge from outside the enterprise, including licences, patents and other know-how or knowledge from external sources. Public funding on S&T activities in South Africa has traditionally supported R&D activities. However, intramural R&D accounted for only 21.2% of innovation expenditure, although 45.1% of innovative enterprises engaged in R&D.

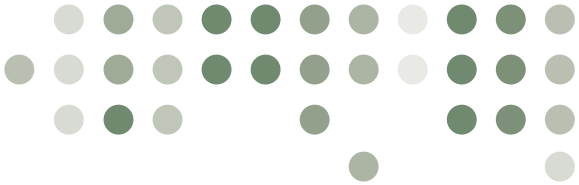
It is clear that expenditure on innovation activities results in sales of new and improved products for enterprises. Enterprises invested R56.9 billion in innovation activities in 2007, including R12.1 billion on intramural R&D expenditure and R6.5 billion on extramural R&D. In the same year, they grossed R209.5 billion in sales of products that were new to the market, and a total of R370.0 billion if products that were new to the enterprise were also included. These returns on prior investment in innovation activities do not include the benefits to enterprises of innovative processes or organisational innovations. These tangible benefits of innovation need to be brought to the attention of business and government in order to further encourage innovation. The closeness of the estimate of intramural expenditure on R&D worth R12.1 billion obtained in the innovation survey, compared with R&D expenditure worth R10.7 billion in the business sector found in the 2007/08 R&D Survey, is encouraging and indicates that South Africa has informative and reliable surveys on both these factors of international competitiveness. In most countries where the CIS 4 survey has been conducted, the reported amounts varied quite widely (Mortensen 2007).

One of the main focuses of policies for a national system of innovation is the linkages between institutions, particularly universities and industry. In direct contrast to this intent, enterprises both in South Africa and abroad perceive that such links are perhaps not particularly important sources of information and collaboration for innovation. The most important links and collaborations for businesses are with other enterprises, their customers and suppliers, and even competitors. It is more difficult for government to stimulate such linkages, which form part of the market-driven business environment of enterprises. It appears that South Africa is far from being unusual in this regard; the lack of linkages between the public and private sector in innovation in the EU has been documented (European Communities 2007c). Another possible conclusion could be that enterprises may have underestimated the role of these public institutions as the initial sources of information in certain instances, since they tend to play a bigger role through conferences and scientific publications.

It is apparent that it is more important for government to rather create an enabling environment for innovation than to try to boost innovation solely through funding programmes. Establishing a more efficient system for South African patents, for example, could contribute to a more enabling environment. Recognition through such mechanisms as press coverage of innovations and awards for innovative enterprises also appears to be a means of encouraging further innovation.

The results of the South African innovation survey closely match the results of the EU-27 profile on questions such as the factors hampering innovation and the most important outcomes of innovation for enterprises. This potentially means that South Africa can share lessons and experiences on policies and instruments for supporting innovation with the EU, countries on the African continent and other regions of the world.

Direct comparisons with countries outside the EU are also critical in order to draw important lessons on the characteristics of their innovation environments and the types of policies they implement to strengthen innovation and competitiveness. This would require that a dedicated project be undertaken to provide the necessary context for comparisons with countries such as India and China that have recorded tremendous achievements in building their national innovation capacities and economic development. At the continental level, the ongoing work on the production of innovation indicators among African countries under the auspices of NEPAD's (New Partnership for Africa's Development) African Science, Technology and Innovation Indicators (ASTII) initiative serves as an important reference point. It is clear that the results of the South African 2008 Innovation Survey have deep local relevance and can provide insight into many of the issues that concern policymakers, such as the apparent lack of collaboration in innovation between public institutions and private enterprises.



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APPENDICES

Appendix 1

The Community Innovation Survey 2006
Methodological recommendations

(In accordance with section 7 of the annex to the Commission Regulation on innovation statistics No 1450/2004)
Final version 27 April 2006

0. Introduction

The Commission Regulation No 1450/2004, implementing Decision No 1608/2003/EC of the European Parliament and of the Council concerning the production and development of Community statistics on innovation (= Commission Regulation on innovation statistics), puts innovation statistics on a statutory basis and makes compulsory the delivery of certain variables. This document, which outlines the harmonized methodology to be used for CIS 2006, is related to section 7, paragraph 3 of the annex of this Commission Regulation on innovation.

1. Target population

The target population of the CIS 2006 shall be the total population of enterprises related to market activities (NACE activities C to K).

1.1. NACE

Core coverage

In accordance with section 2 of the annex of the Commission Regulation on innovation statistics, the following industries shall be included in the core target population of the CIS 2006:

- mining and quarrying (NACE 10-14)
- manufacturing (NACE 15-37)
- electricity, gas and water supply (NACE 40-41)
- wholesale trade (NACE 51)
- transport, storage and communication (NACE 60-64)
- financial intermediation (NACE 65-67)
- computer and related activities (NACE 72)
- architectural and engineering activities (NACE 74.2)
- technical testing and analysis (NACE 74.3)

Additional coverage, in order of descending priority (to be done on a voluntary basis):

- research and development (NACE 73)
- construction (NACE 45)
- motor trade (NACE 50)
- retail trade (NACE 52)
- legal, accounting, market research, consultancy and management services (NACE 74.1)
- advertising (NACE 74.4)
- labour recruitment and provision of personnel (NACE 74.5)
- investigation and security activities (NACE 74.6)
- industrial cleaning services (NACE 74.7)
- miscellaneous business activities n.e.c. (NACE 74.8)
- real estate activities (NACE 70)
- hotels and restaurants (NACE 55)
- renting of machinery and equipment without an operator (NACE 71)

These economic activities should be regarded as "non-core" and do not necessarily have to meet the same quality requirements as for the core coverage e.g. for item and unit non-response (i.e. a non-response survey does not have to be carried out in respect of these NACE industries) or the required level of precision.

1.2 Size-classes

It is recommended that **all** enterprises be included in the target population. However, the minimum coverage shall be all enterprises with **10 employees or more**.

1.3. Statistical units

The main statistical unit for the CIS 2006 shall be the enterprise, as defined in the Council Regulation 696/1993 on statistical units or as defined in the national statistical business register. EU Regulation 2186/1993 requires that Member States set up and maintain a register of enterprises, as well as associated legal units and local units.

In the Council Regulation 696/1993[1], the enterprise is defined as "the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision making, especially for the allocation of its current resources. It may carry out one or more activities at one or more locations and it may be a combination of legal units, one legal unit or part of a legal unit."

In general, innovation activities and decisions usually take place at the enterprise level, which leads to the enterprise being used as the statistical unit. If the use of the enterprise as a statistical unit is not feasible, other units such as the division of the enterprise group, the kind of activity unit (KAU), the local kind of activity unit (LKAU) or the enterprise group may be used instead.

[1] Council Regulation (EEC) N° 696/1993 of 15 March 1993, OJ N° L76 of the 3 March on the statistical units for the observation and analysis of the production system in the Community.

1.4 The observation period

The observation period to be covered by the survey shall be 2004-2006 inclusive i.e. the three-year period from the beginning of 2004 to the end of 2006. The reference period of the CIS 2006 shall be the year 2006.

2. Survey methodology

2.1. Sampling frame

The **official, up-to-date, statistical business register[2] of the country** should be used.

2.2 Census or sample survey

Data should be collected through a census, sample survey or a combination of both.

2.3 Stratification

The target population shall be broken down into similar structured subgroups or strata (which should be as homogeneous as possible and form mutually exclusive groups). Appropriate stratification will normally give results with smaller sampling errors than a non-stratified sample of the same size and will make it possible to ensure that there are enough units in the respective domains[3] to produce results of acceptable quality.

The stratification variables to be used for the CIS 2006, i.e. the characteristics used to break down the sample into similarly structured groups, should be:

- The economic activities (in accordance with NACE)[4].

  In accordance with the requirements of section 5, paragraph 2 of the annex of the Commission Regulation on innovation statistics, stratification by NACE should be done at least at two-digit (division) level, except for NACE 74. Here the three digit sections NACE 74.2 and 74.3 should be treated as separate NACE categories while NACE 74.1 and 74.4 to 74.8 should be treated as a single NACE category.

- Enterprise size according to the number of employees[5].

  The size-classes used should at least be the following:

  - 0-9 employees
  - 10-49 employees

[2] Council Regulation (EEC) N° 2186/1993 of 22 July 1993.
[3] Domains are defined as strata or combinations or strata, for which results will be published.
[4] The NACE code to use for stratification should be that of the enterprise at the end of the reference period 2006.
[5] The enterprise size to use for stratification should be the number of employees at the end of the reference period 2006.

- 50-249 employees
- 250+ employees.

More detailed breakdown by size classes may also be used, but, whatever size-classes are chosen, they should fit into the above size groups.

- Regional aspects:

In accordance with section 7, paragraph 2 of the annex of the Commission Regulation on innovation statistics, the methodology will include regional aspects. Therefore, the regional allocation of the sample shall be taken into consideration when sampling.

2.4. Sample size

There is no minimum sample size needed, as long as the sample size chosen will meet the precision levels required (see section 4.6). However, if a particular stratum has less than 6 enterprises, then all the enterprises in this stratum should be selected for the survey.

The expected response rate should be borne in mind i.e. the sample size should take into account the non-response rates experienced in CIS 4 and compensate accordingly. Finally, there should be no replacement of deleted or not-relevant units. The sample size should be large enough to compensate for any of these types of units.

2.5 Sample selection and allocation

The selection of the sample should be based on random sampling techniques, with known selection probabilities, applied to strata. It is recommended to use simple random sampling without replacement within each stratum.

Different allocation schemes can be used, depending on the structure of the population. It is recommended to use optimum allocation, taking into account the need to "compromise" the allocation, in order to obtain the required levels of precision for all indicators and domains.

The variance in each stratum to be used for sample selection can be based on previous CIS 4 results, if there is reliable information available. If not, one can either use the CIS 4 national average or assume that a problem stratum will be close to a stratum for which reliable results are available. If new sectors of the economy are added for the CIS 2006, one can either use the national average for the CIS 4 or assume that the new sector will be close to a sector that has been sampled previously.

Member States are free to use whatever sampling methods they prefer, as long as the quality thresholds for the results are achieved. However, in accordance with section 7, paragraph 4 of the annex of the Commission Regulation on innovation statistics, Eurostat should be informed of the method of sampling and allocation scheme being used.

3. Collecting and processing of data

3.1 SAS programs for processing the data

The SAS programs which were used for CIS 4 will be updated for use for the CIS 2006 and will be provided free (along with user documentation) to those Member States that want to use them[6]. There will be some user support for these programs once the CIS 2006 starts. The program rules will also be provided.

3.2 Survey questionnaire

The CIS 2006 will be based on a harmonised survey questionnaire for all NACE sectors that is taken over from the CIS 4. The questionnaire shall cover the main themes listed in the Oslo Manual. This harmonised questionnaire shall be used in all national innovation surveys.

3.3 Data collection

The CIS 2006, like the previous innovation surveys, shall be mainly based on mail surveys. These provide a relatively inexpensive means of gathering information from a widely dispersed sample. Other data collection methods, such as internet surveying or personal interviews may also be used, as long as data quality is assured.

Member States may combine the CIS 2006 questionnaire with other surveys, **as long as this does not negatively affect the quality of the output of the CIS 2006**.

3.4. Data editing

Throughout the processing cycle, there should be a systematic and sustained follow up with the responding enterprises to make sure that the data provided is of good quality and passes all edit checks. Data quality checks have to be done at micro- and macro-level by Member States before the results are finally processed and sent to Eurostat. The checking routines of the SAS programs will be delivered to the Member States.

Of course, the SAS edits can be adapted for other computer systems and Member States can also develop their own checks and edits, i.e. the CIS 2006 data could be linked with other national data or be compared with R&D survey data.

4. Data quality

[6] There are also now procedures available in SAS such as PROC SURVEYSELECT, PROC SURVEYMEANS and PROC SURVEYREG that can perform statistical procedures for complex sample surveys.

4.1. Response rates

The units that do not respond to the CIS 2006 survey questionnaire may have different characteristics than those that do respond. Therefore, all efforts shall be made to minimise unit (and item) non-response.

The recommended technique to elicit response is to send at least two reminder letters to the sampled enterprise. These should be sent out within an acceptable period after the sending of the original questionnaire. In some cases, timely telephone reminders may also prove useful.

4.2 Unit non-response and non-response survey

If non-respondents, as an un-weighted percentage of all relevant enterprises in the sampling frame, exceed 30%, then a simple random sample of **at least** 10% of the non-respondents (excluding non-relevant enterprises) should be selected. The form to be used for this non-response survey is to be specified. It shall include some of the questions of the standard CIS 2006 questionnaire, in order to determine if the non-respondent is an innovator or not. If non-response is not equally distributed across strata, Member States may use a stratified non-response sample.

The non-response survey should have a very high response rate. This non-response survey should be carried out for at least the core target NACE population.

If the results from the non-response analysis indicate that there is a difference between respondents and non-respondents for a certain type of enterprise, this information should be used when calculating the weighting factors (see section 4.5). Member States shall describe how the information from the non-response survey has been used to reduce eventual bias in the estimates.

4.3 Item non response

Item non-response should be kept at a minimum by asking the enterprises for the additional information needed. Item non-response for general variables on the enterprises should not exist, as this information should be available in the business register or from other sources. Some respondents may return questionnaires that have some items filled in, but these cases should only be counted as respondents if they are usable in the processing stage.

Before carrying out automatic imputation, Member States should, as far as possible, make use of administrative, historical (e.g. the CIS 4 survey) or other available data sources such as R&D surveys.

4.4 Imputation

To correct for item non-response (after every attempt is made to get the information from the enterprises concerned) imputations shall be done. Imputed values should be flagged as this enables proper non-response analysis to be done.

The SAS software package (see section 3.1) will impute metric (or measurement) variables separately from ordinal (or ranking) variables, as was done for the CIS 4.

(1) Metric variables

A weighted mean of each metric variable, by NACE and size class, is calculated and applied as a ratio to the enterprises with the missing values, within the stratum concerned.

(2) Ordinal, nominal and percentage variables

This imputation shall be done after the metric estimation. The technique used is nearest-neighbour hot decking using entropy[7]. This technique will use data from clean records (a donor with a record not violating any error check), in order to copy the missing data. The donors are chosen in such a way that the distance between the donor and recipient be minimised[8].

Member States may also use other reliable methods of imputation, as long as the quality of results is at least identical.

4.5 Weighting and calibration

The survey results should be weighted in order to adjust for the sampling design and for unit non-response to produce valid results for the target population. Additional auxiliary information should also be incorporated, if it is considered that this will enhance the accuracy of the estimates.

The basic method for adjusting for different probabilities of selection used in the sampling process is to use the inverse of the sampling fraction i.e. using the number of enterprises or employees. This would be based on the figure N_h/n_h where N_h is the total number of enterprises/employees in stratum h of the population and n_h is the number of enterprises/employees in the **realised** sample in stratum h of the population, assuming that each unit in the stratum had the same inclusion probability. This will automatically adjust the sample weights of the respondents to compensate for unit non-response.

However, if a non-response analysis is carried out (and the results indicate that there is a difference between respondents and non-respondents), then the results of the non-response analysis should also be used when calculating the final weighting factors. One approach is to divide each stratum into a number of response homogeneity groups with (assumed) equal response probabilities within groups. A second approach could be to use auxiliary information at the estimation stage for reducing the non-response bias.

If the frame contains auxiliary information about the sampling units i.e. variables that are correlated with at least some of the measurement variables of interest, this information should

[7] Cold deck imputation, on the other hand, makes use of a fixed set of values, which covers all of the data items. These values can be constructed with the use of historical data, subject-matter expertise, etc. A 'perfect' questionnaire is created in order to answer complete or partial imputation requirements.

[8] Nearest neighbour imputation: In this case a criteria is developed to determine which responding unit is 'most like' the unit with the missing value in accordance with the predetermined characteristics. The closest unit to the missing value is then used as the donor.

be used to improve the estimation further[9]. In general, the variables to use for calibration are turnover and the number of enterprises, both by NACE and size classes but others can also be used.

Various software packages are available to do the calculations needed to derive calibrated weights. These include:

- CLAN. This was developed by Statistics Sweden and it is a suite of SAS-macro commands.
- CALMAR (Calibration on Margins). This is another SAS macro developed by INSEE in France.
- CALJACK. This is also a SAS macro developed by Statistics Canada.

Several different sets of weights may be produced, depending on the variables of interest. In practice however, there will probably be only up to three different weights produced.

Member States are free to use whatever calibration technique they prefer but, in accordance with section 7, paragraph 4 of the annex to the Commission Regulation on innovation statistics, they should provide information about the calibration methods used.

4.6 Precision of results

The CIS 2006 should be carried out in order to achieve a certain level of precision for the total population concerning the following indicators:

1. Percentage of innovation active enterprises.
2. Percentage of innovators that introduced new or improved products to the market.
3. New or improved products, as a percentage of total turnover.
4. Percentage of innovation active enterprises involved in innovation cooperation.

These variables are listed in section 1 of the annex of the Commission Regulation No 1450/2004 on innovation statistics. In addition, the CIS 2006 should also achieve a certain level of precision for the total population with regard to the following indicator:

5. Total turnover per employee.

Article 6 of the Commission Regulation on innovation statistics states that quality evaluation shall be carried out by Member States. Therefore, after processing the data,

the 95% confidence intervals[10] for the first three indicators should be $\hat{\theta} \pm 0.05$, for indicator 4 the 95% confidence interval should be $\hat{\theta} \pm 0.10$, and for indicator 5 the confidence interval should be ± 10% of the estimate $\hat{\theta}$.

[9] It can be done for balancing purposes (in the sense that after calibration, "the sample looks like the population") or for improved consistency of estimates (in production systems, each sampled unit is given a unique final weight as part of the calibration process; as a result, estimates are consistent in the sense that the parts add up to the totals).

[10] The confidence interval for the parameter, $\hat{\theta}$, with approximate confidence level of 95%, is given by:

In accordance with section 7, paragraph 4 of the annex of the Regulation No 1450/2004 on innovation statistics, Member States shall transmit these quality results to Eurostat.

5. Transmission of data

5.1 Data to be transmitted

Article 5 of the Commission Regulation on innovation statistics lays down two types of data to be transmitted to Eurostat. The first set refers to aggregated statistics that will be transmitted on a compulsory basis while the second refers to individual data records that will be transmitted on a voluntary basis.

The annex to the Regulation says that, beyond the statistics listed in section 1 of the annex, additional tabulated statistics will be decided in close cooperation with Member States. Eurostat will provide the tabulation scheme as well as the transmission format to be used for both data sets (the micro-data set and the tabulated dataset) to Member States.

Aggregated statistics shall be treated in accordance with the standard confidentiality rules at national level (including secondary confidentiality), before transmission to Eurostat. Confidential tabulated data may also however be transmitted, in accordance with Council Regulation 1588/1990[11], article 3.

In accordance with section 7, paragraph 4 of the annex of the Commission Regulation No 1450/2004 on innovation statistics, metadata (which Eurostat will specify) should also be sent. This will include key quality indicators such as non-response rates, coefficient of variation, etc.

The individual data records will be submitted to quality checks. This data will also be used for the compilation of an anonymized micro data set and be made available for further scientific research, according to the procedures laid down in Commission Regulation 831/2002. [12]

5.2 Output tabulation

In accordance with section 5, paragraphs 1 and 2 of the annex of the Commission Regulation No 1450/2004 on innovation statistics, results will be broken down by economic activity and employment size classes. The output tabulation (which will be produced in accordance with annex 1 of the Commission Regulation on innovation statistics) will be based on the tabulation used for the CIS 4.

$$\hat{\theta} \pm 1.96 \cdot \sqrt{Variance(\hat{\theta})}$$

[11] Council Regulation 1588/1990 on the transmission of data subject to statistical confidentiality to the Statistical Office of the European Communities.

[12] Commission Regulation 831/2002 mentions the Community Innovation Survey as one of the surveys where anonymised micro data may be made available to researchers under specific conditions (controlled access).

However, with regard to regional data, the tabulation scheme will also contain results broken down by:

- NUTS 2 level by industry (NACE C to E) and services (NACE G to K).
- NUTS 2 level by size classes (as listed in section 2.3).

5.3 Transmission tools

CIS 2006 data shall be transmitted to Eurostat via STADIUM. This safe, secure procedure guarantees a method of tracking transmission. All necessary steps should be taken to ensure that the STADIUM system is working at national level.

5.4 Deadlines

The deadlines for data transmission listed in the annex of the Commission Regulation No 1450/2004 on innovation statistics should be respected. These deadlines are:

- Transmission of tabulated data – at the latest by 30th June 2008. This will be the main source for data dissemination.
- Transmission of micro data - at the latest by 30th June 2008.

This deadline should also be respected with regard to the transmission of the information related to section 7, paragraph 4 of the annex of the Commission Regulation on innovation statistics i.e. information concerning the methodology used in the national innovation survey.

Annex 1: Target population changes

The following are situations where the target population may change or cause difficulty during the survey:

- Subsidiaries of multinationals requesting contact with the parent organization. While the subsidiaries may get the information from abroad, the information should only relate to the particular national subsidiary. There is a general difficulty with getting multi-national organizations to report information at national level but they will have to make every effort to delineate their data for national units at least. Only domestic units of multi-national corporations should be included in the survey.

- Companies under liquidation or that were liquidated during the observation period (2004-2006 inclusive). Companies that were liquidated before the period should not be considered as part of the target population. Companies that were liquidated during the period should also be deleted from the sample and target population, unless it is decided that their liquidation was so late in the survey period that they should be included in the target population.

- New companies created during the observation period. These should be added to the population.

- Enterprises changing NACE section. These should be recoded accordingly and considered as part of the new NACE section rather than the old one.

- Two or more enterprises combine to form one enterprise. If this happened before or at the beginning of the survey period (and one or more of the units is in the sample) then the new unit should respond with a single form for both (or more) enterprises. Additionally the population should be changed to delete the two (or more) individual units and to include the new unit only. If neither unit was in the sample then the population should simply be amended to reflect the changes.

  If the merger happened late in the survey period, then the original units can be treated as they are, i.e. separately, and ignore the merger. Care will have to be taken however that neither unit returns information for more than its' original elements and they do not send in responses covering the other merged elements as well.

- Enterprises that split to form new units. If this happened early in the survey period then the target population should be amended to reflect the new units. Any such enterprise that is part of the sample should return forms for each new unit separately. If the split happens late in the survey period or if the enterprise cannot supply information on each new element separately, keep the unit as it was before the split.

- Enterprises that are outside the target population, i.e. in NACE sections not covered by CIS 2006. These should be excluded from all processing if they are in the sample. In addition, the target population should be adjusted before the calculation of weights, in order to exclude these and other types of non-relevant enterprises.

Annex 2: Sample size calculation and allocation[13]

Generally, the factors that affect precision of the results are:

- Size of the population
- Variability of characteristics in the population
- Sample plan and estimators
- Non- response
- Cost and time
- Operational constraints (like training of staff etc.)

I. Estimation of parameters

Consider a set of variables $y_1,\ldots,y_a,\ldots..,y_A$ and let $y_a(k)$ be the value of variable y_a for unit k in the finite population U. Also, consider a partitioning of U into D possibly overlapping domains $U_1 \ldots U_2 \ldots U_D$. For each one of the A^xD possible combinations of variables and domains, a number of parameters θ of interest can be defined for the whole population or for different domains.

II. Sample design

The sample is drawn as stratified sample with simple random sampling without replacement within strata. The stratification is according to section 2.3, taking into account the study-domains for the output tabulation in section 5.2.

III. Sample size in domains of study

Each domain is considered as a population, which is divided into one or more strata. The sample size, n_D , in domain D is calculated as:

$$n_D = \frac{\left(\sum_{h=1}^{H} W_h \cdot S_h\right)^2}{V\left(\hat{\theta}_D\right) + \frac{1}{N_D}\sum_{h=1}^{H} W_h \cdot S_h^2} \qquad (2.1)$$

where $V\left(\hat{\theta}_D\right)$ is the variance for the estimated parameter; H is number of strata in domain D; $W_h = N_h / N_D$, where N_h is the number of enterprises in stratum h; N_D is the number of enterprises in domain D; and S_h^2 is the stratum variance for the variable, y_a.

[13] For general information on sampling, see Cochran W. G. (1977) Sampling Techniques, third edition, John Wiley.

$$S_h^2 = \frac{1}{N_h - 1} \sum_{k \in a_h} \left(y_a(k) - \frac{1}{N_h} \sum_{k \in a_h} y_a(k) \right)^2 \qquad (2.2)$$

The expression in (2.1) is obtained by considering the cost to be equal for all strata, e.g. $c_h = c$ for all h, as in formulae (5.25) in section 5.5 in Cochran[14].

IV. Precision
The confidence interval for the parameter, θ, with approximate confidence level of 95%, is given by:

$$\hat{\theta}_D \pm 1.96 \cdot \sqrt{V(\hat{\theta}_D)} \qquad (2.3)$$

The precision, α_D, in terms of the length of the confidence interval:

$$\alpha_D = 1.96 \cdot \sqrt{V(\hat{\theta}_D)} \qquad (2.4)$$

From (2.4) the variance, $V(\hat{\theta}_D)$, can be expressed as:

$$V(\hat{\theta}_D) = \left(\frac{\alpha_D}{1.96} \right)^2 \qquad (2.5)$$

By combining (2.1) and (2.5), the sample size in domain D is given by:

$$n_D = \frac{\left(\sum_{h=1}^{H} W_h \cdot S_h \right)^2}{\left(\frac{\alpha_D}{1.96} \right)^2 + \frac{1}{N_D} \sum_{h=1}^{H} W_h \cdot S_h^2} \qquad (2.6)$$

Note

1. To calculate n_D, the true variances in each stratum, S_h^2, is needed and the precision, α_D.
2. In practice, the standard deviations for each stratum, S_h, are not known. Therefore, the CIS 4 or other sources might have to be used, but these estimates might be rather unreliable.
3. The above-described sample size calculation will ensure that the sampling error of a specific variable does not exceed the predetermined value. However, in section 4.6

[14] Cochran W. G. (1977), Sampling Techniques, third edition, John Wiley; section 5.5 (Optimum Allocation)

there are 5 indicators for which a certain level of precision should be attained. The sample size thus needs to be calculated for each indicator and the largest sample size should be used.

II. Allocation

If the cost per unit is the same in all strata, then the *Neymann allocation* can be used. The total sample size in the domain, *D*, is distributed among strata, e.g. the sample size in stratum *h*, n_h, is given by:

$$n_h = n_D \cdot \frac{N_h \cdot S_h}{\sum_{h=1}^{H} N_h \cdot S_h}. \qquad (2.7)$$

Note

1. The determination of an optimum allocation is often an iterative process. The first step may yield, in some strata, a sample size larger than the number of enterprises in the population. The usual procedure is to take all enterprises in those strata as part of the sample and subsequently reduce the total sample size and recalculate n_h again for the remaining strata.

2. The above-described allocation is optimal for a specific variable. It might not be the case when allocating the sample for other variables and "compromise" allocation schemes are needed. For the CIS 2006 the sample has to be allocated in order to meet the precision criteria for the 5 indicators for which a certain level of precision of results is required (see section 4.6).

3. Several different such schemes can be used. A simple procedure for multivariate allocation is to compute the average sample sizes for each stratum but methods that are more sophisticated may also be used.

Annex 3: Data editing

The types of checks being done in the SAS programmes are:

- Completeness checks. This is where the questionnaire is not fully completed. Contact should be made with the reporting unit to get the information as soon as possible after receipt of the incomplete form.

- Out of scope units. These are units which do not belong to the target population i.e. wrong NACE, wrong size etc. If this is the case, i.e. if the units are not part of the target population, then they will be dropped from further data processing.

- Data validation checks. This tests whether answers are permissible i.e. the answer is within the range of answers allowed. If a validation error occurs then the answer must be amended (by getting further information from the enterprise for example) to bring it into line with the range allowed.

- Relational checks. This checks that the relationship between two variables is within specific bounds i.e. innovation expenditure should equal the total given. These errors may be "hard" (a violation of the rule indicates that something is incorrect) or "soft" (just a warning that something might be wrong). The hard errors will have to be corrected while the soft errors should be confirmed with the enterprise (and corrected if the information is actually wrong).

- Routing errors. This tests whether all questions that should have been answered have been answered, i.e. innovators answered questions on effects of innovation. An error here indicates that the respondent did not understand the sequencing of questions. They should be contacted to correct the information.

A more complete description of the data editing (and also imputation, estimation etc.) procedure will be provided with the updated SAS programs.

Annex 4: Total Design Method

The Total Design Method (Dillman, D. (1978): The Total Design Method, Wiley) consists of a combination of actions (or moments) that have proven effective in reducing non-response when using mail questionnaires.

The theory underlying the TDM is social exchange, which suggests that the likelihood that individuals will respondent to a survey questionnaire is a function of how much effort is required to respond, and what they feel they are likely to get in exchange for completing the questionnaire.

The TDM was originally developed for individual and household surveys. An adaptation for the business environment is described in Tailored Design Method (Dillman, 2000) and Moore & Baxter (Moore, D. and Baxter, R. 1993) in "Increasing Mail Questionnaire Completion for Business Populations: The Effects of Personalization and a Telephone Follow-up Procedure as Elements of the Total Design Method".

Five main actions that can be used to improve response rates in business surveys are:

Have a respondent-friendly questionnaire. This should be easy and clear to understand, have a relevant question order and a comprehensible, "user-friendly" layout.

There should be up to five contacts with the potential respondent. A pre-notice letter (sent to respondents a few days prior to the questionnaire), the questionnaire (sent a few days to a week after the pre-notice letter, a thank you/reminder postcard (sent about one week after the questionnaire). If necessary, there should also be a replacement questionnaire (sent to non-respondents between 2-4 weeks after questionnaire was mailed) and a final contact (made a week after the replacement questionnaire was sent out.

In all cases where mail response is requested, the use of a real stamp on return envelopes can increase the response rates (It represents something of value and is something the respondent is less likely to throw away).

Personalised correspondence could be used by using real stationery, real names and real signatures.

Finally, a small token or financial incentive can significantly improve response rates. However, incentives can have modest and, in some cases, no effect at all.

Other references that can be consulted for more information are:

Paxson, M.C.; Dillman, D.A.; Tarnai, J.: Improving Response to Business Mail surveys.
Dillman, D.A.: Mail & Internet Surveys: The Tailored Design Method. Wiley, 2000

Annex 5: Testing the non-response survey

The aim of this analysis is to sample a selection of non-respondents and find out if they have a different behaviour than that of the original respondents.

If a non-response survey has been carried out (as it should be if the non-response rate is above 30%, i.e. 30% or more of relevant enterprises did not respond to the survey), a statistical test has to be carried out to check whether the population of non-respondents is significantly different from the populations of respondents.

Test for the equality of two proportions:

H_0: $P_R = P_{NR}$ or $P_R - P_{NR} = 0$ where $\mathbf{P_R}$ is the weighted percentage of innovators in the respondent population and $\mathbf{P_{NR}}$ is the weighted percentage of innovators in the non-respondent population.

H_1: $P_R \neq P_{NR}$

Test statistic:

$$Z = \frac{(\hat{P}_R - \hat{P}_{NR})}{\sqrt{S^2(\hat{P}_R) + S^2(\hat{P}_{NR})}}$$

$S^2(\hat{P}_R)$ is the estimated variance of the proportion of innovators in the original, realised sample, calculated after weighting for sampling fractions while $S^2(\hat{P}_{NR})$ is the estimated variance of the proportion of innovators in the non-response sample.

If a simple random sample or a stratified sample of the non-respondents is drawn then the variance , $S^2(\hat{P}_{NR})$, would be calculated as:

$$S^2(\hat{P}_{NR}) = \sum \left(\frac{N_h(1-r_h)}{N(1-r)} \right)^2 \left(\frac{\hat{P}_{NRh}(1-\hat{P}_{NRh})}{n_{NRh}} \right) \left(1 - \frac{n_{NRh}}{N_h(1-r_{h)}} \right)$$

Where $\left(\frac{N_h(1-r_h)}{N(1-r)} \right)$ is the weight of stratum *h*.

$\hat{P}_{NRh}$ is the percentage of innovators in the non-response sample in stratum *h*
N_h is the total number of units in the frame population in stratum *h*
n_{NRh} is the number of units in the non-response sample in stratum *h*
r_h is the response rate of the original sample in stratum *h*

With large enough sample sizes, the Z-statistics will be approximately normally distributed. Therefore, if the test statistic is in the critical region (usually defined as greater than 1.96 or less than -1.96, for a 95% confidence interval) then H_0 can be rejected i.e. there is a statistically significant difference between the two proportions[15].

[15]For further information, see Wonnacott, H., and Wonnacott, J. R., Introductory Statistics, 5th Edition, John Wiley, 1990, chapter 9.

Annex 6: Imputation procedures

The SAS program documentation for CIS 2006 describes the process of imputation in more detail. However, a brief description is given here.

Metric imputation

Metric imputation shall take the "clean" data set, estimate the missing items and create a complete metric data set.

The steps involved are:

- Detect and exclude outliers from calculations of the mean.
- Impute the weighted ratio mean, taking into account the amount of missing values within each stratum.

The key factors affecting metric imputation are:

- Values of the three parameters (factor1, factor2 and remout) which control the process
- Amount of item non-response

Factor1 is the outlier value used to remove extreme values from the dataset (of responses for that variable) before imputation. By default, this is 1.5 (or 1.5 times of the inter-quartile range). In a skewed distribution, this might lead to too many records being rejected. This criterion is checked by the value of the Remout variable. By default this is 30, i.e. do not use factor1 where its use leads to the rejection of 30% or more of the records. If the remout value is exceeded, then the imputation procedure moves onto factor2. By default this is set at 3.0 i.e. use all records within 3.0 times of the inter-quartile range.

The three variables controlling the imputation procedure can be amended within the SAS program but, for comparability purposes, it is important that the values used should be as close to the default values as possible. Therefore, the first step to improve item non-response should be to improve response rates. It is very important that item non-response should be kept to a minimum.

After this has been done, if the variables controlling imputation have to be changed (because records are still not being imputed), start off by increasing the remout value little by little until the imputation procedure improves (for example reduce from 30% to 25% to 20%). If this does not work increase factor2 and remout (from its original value) until the imputation procedure produces acceptable results.

If item non-response within a stratum is higher than 50% then the stratum is merged with a neighbouring size class in the same NACE class. If the proportion of non-missing values is still lower than 50% for all size groups within the NACE class the imputation is implemented within subsections of NACE or ultimately by using the whole population. Where strata have non-response rates higher than 50%, every effort should be made to improve the results for these critical strata.

Ordinal and nominal imputation

After the metric estimation comes the Ordinal estimation. The objective of this process step is to estimate nominal and ordinal variables (and in some cases metric variables). As for the metric estimation, it is the amount and structure of the item non-response that is the main factor influencing the outcome of the imputation process.

The basic method is:

- Metric variables are broken down into classes. Respondents are partitioned into classes such that the elements in the same class are considered similar. The variables used here are NACE and size class.
- Metric and ordinal variables are used to estimate nominal variables.

The key factors affecting the ordinal imputation are:

- Values of one parameter (classl) which controls the process
- Amount of item non-response

ClassL determines how much data to include for each variable in the imputation process. If ClassL=2 then only one class is created around the median, excluding large proportions of the data (outliers). ClassL=5 includes more data and creates 4 classes etc.

If there is still item non-response after ordinal estimation, there might be several reasons for this:

- Item response is very low, too low for some strata. This should be addressed by trying to improve response rates in these critical strata at least.
- The setting of ClassL is too strict, reducing the critical mass of data for the estimation procedure. Therefore, increase ClassL to include more data.

However, as for metric estimation, it is important that the final setting is as close to the benchmark (set for each variable in the SAS programs) as possible, in order to maintain comparability of data.

ANNEX 3

EUROPEAN COMMISSION
EUROSTAT

Directorate A: Statistical information systems; research and data analysis; technical cooperation with Phare and Tacis countries
Unit A-4: Research and development, methods and data analysis

Luxembourg, 5 March 2001
ESTAT/A-4/FF/INNO

To
Non-EU Member States

Subject: Third Community Innovation Survey – core questionnaire and survey methodology

Please find the final version of the core questionnaire for the third Community Innovation Survey. In addition you will find the survey methodology that will be used.

This survey will be launched in the EEA Member States in 2001. In case you plan to launch an innovation survey in your country we would appreciate that you used the core questionnaire and the survey methodology as basis for your national survey. This would improve the comparability of innovation indicators between regions and economies worldwide.

Harald Sonnberger
Head of Unit A4

Person to contact: Frank Foyn (+352 4301 33037/ frank.foyn@cec.eu.int)

Appendix 3

South African National
Innovation Survey 2008

Mining, Manufacturing and Services

In line with the European Union (EU) Fifth Community Innovation Survey (CIS5), this survey is being undertaken in all EU and numerous other countries.

science & technology
Department: Science and Technology
REPUBLIC OF SOUTH AFRICA

In association with Statistics South Africa

Statistics South Africa

HSRC
Human Sciences Research Council

PLEASE NOTE
In order to be able to compare enterprises with and without innovation activities, we request ALL enterprises to respond to ALL questions, unless otherwise instructed.

Please change address label if necessary

South African National Innovation Survey 2008

page 2 of 12

About this survey: This survey collects information about product and process innovation as well as organisational and marketing innovation during the three-year period 2005 to 2007 inclusive.

Scope: The statistical unit for the survey is the enterprise as defined by Statistics South Africa. An enterprise refers to a business, company or firm and can range from a very small concern with only one or two employees to a much larger and more formal business or firm.

Authority: The Department of Science and Technology (DST), as a component of the National Statistics System, commissions the HSRC to perform this survey.

Confidentiality: All information gathered by this survey will be held in strictest confidence. Under no circumstances will the HSRC, DST or Statistics South Africa publish, release or disclose any information on, or identifiable with, individual firms or business units.

If you have any problems in completing this form and/or meeting the due date, please do not hesitate to contact the staff listed below for assistance:

Staff member	Sector of responsibility	Telephone	E-mail
Karen Heath	Wholesale and Retail Trade	021 466 7830	kheath@hsrc.ac.za
Nombongo Mongo	Mining & Quarrying, Transport, Storage and Communication	021 466 7813	nmongo@hsrc.ac.za
Mtembukazi Sibindlana	Wholesale Trade	021 466 7815	msibindlana@hsrc.ac.za
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Michelle Reddy	Electricity, Gas & Water, Financial Intermediation and Engineering	021 466 7840	mreddy@hsrc.ac.za
Aeysha Semaar	Manufacturing (Food, Beverages, Textiles and Wood Products)	021 466 7800	asemaar@hsrc.ac.za
For general or specific enquiries please call			
Cheryl Moses	Researcher	021 466 7843	cmoses@hsrc.ac.za
Weziwe Sikaka	Researcher	021 466 7839	wsikaka@hsrc.ac.za
William Blankley	Director	021 466 7806	wblankley@hsrc.ac.za

For any general queries by e-mail: innovation@hsrc.ac.za

Person completing this questionnaire:

Name:

Job title:

Phone:

E-mail:

South African National Innovation Survey 2008

1. General information about the enterprise, business, company or firm

1. Short description of your main business activity:

1.1 Is your enterprise part of a larger group?
A group consists of two or more legally defined enterprises under common ownership. Each enterprise in the group may serve different markets, as with national or regional subsidiaries, or serve different product markets. The head office is also part of an enterprise group.

Yes ☐ No ☐

In which country is the head office of your group located?

If your enterprise is part of an enterprise group, please answer all further questions only for your enterprise in South Africa. Do not include results for subsidiaries or parent enterprises outside of South Africa.

1.2 In which geographic markets did your enterprise sell goods or services during the three years 2005 to 2007?

- South Africa (only some provinces) ☐
- South Africa (national) ☐
- Rest of Africa ☐
- Europe ☐
- United States ☐
- Asia ☐
- Other countries ☐

1.3 What was your enterprise's total number of employees in 2005 and 2007?
Annual average number of employees, both full-time and part-time. If not available, give the number of employees at the end of each year.

2005 ☐☐☐☐☐☐
2007 ☐☐☐☐☐☐

1.3.1 Approximately what percentage of your total employees had a university or technikon degree or diploma in 2007?

☐☐☐ %

1.4 What was your enterprise's approximate total turnover for 2005 and 2007?
Turnover is defined as the market sales of goods and services (Include all taxes except VAT).
Please give turnover in Thousands ('000s) of Rand e.g. One million Rand or R1 000 000 should be entered as 1 000: ☐1 0 0 0 000 = R1m.

Rand thousand

2005 ☐☐☐ ☐☐☐ ☐☐☐ 000
2007 ☐☐☐ ☐☐☐ ☐☐☐ 000

South African National Innovation Survey 2008

2. Product (goods or services) innovation

A product innovation is the introduction to market of a new good or service or a significantly improved good or service with respect to its capabilities, such as improved user-friendliness, components, software or sub-systems. The innovation (new or improved) must be new to your enterprise, but it does not need to be new to your industry sector or market. It does not matter if the innovation was originally developed by your enterprise or by other enterprises.

Please note: The latest terminology classifies "products" as consisting of both "goods" and "services". For example a firm in the financial services sector may talk of a "new financial product". The provision of innovative services is of increasing importance in competitive economies and the survey aims to cover both manufacturing and services orientated firms.

2.1 During the three years 2005 to 2007, did your enterprise introduce:

→ New or significantly improved goods.
Exclude the simple resale of new goods purchased from other enterprises and minor changes that only alter the appearance of the product.

Yes ☐ No ☐

→ New or significantly improved services.

Yes ☐ No ☐

↳ If no to **both** questions, please go to question **3.1**

2.2 By whom were these product (goods and services) innovations developed?

→ Mainly your enterprise or enterprise group ☐

→ Your enterprise together with other enterprises or institutions ☐

→ Mainly other enterprises or institutions ☐

Select the single most appropriate option only

2.2.1 Did these innovations originate mainly in South Africa or abroad?

South Africa ☐ Abroad ☐

2.3 Were any of your goods and service innovations during the three years 2005 to 2007 new to your market or new to your firm?

→ New to your market?
Your enterprise introduced a new or significantly improved good or service onto your market before your competitors (it may have already been available in other markets).

Yes ☐ No ☐

→ Only new to your firm?
Your enterprise introduced a new or significantly improved good or service that was already available from your competitors in your market.

Yes ☐ No ☐

2.4 Using the definitions above, please estimate the percentage of your total turnover in 2007:

2007 TURNOVER DISTRIBUTION

→ Goods and service innovations introduced during 2005 to 2007 that were new to your market ☐☐☐ %

→ Goods and service innovations introduced during 2005 to 2007 that were only new to your firm ☐☐☐ %

→ Goods and services that were unchanged or only marginally modified during 2005 to 2007 ☐☐☐ %
Include the resale of new goods or services purchased from other enterprises.

Total turnover in 2007 = 100% 1 0 0 %

South African National Innovation Survey 2008

3. Process innovation

Process innovation is the use of new or significantly improved methods for the production or supply of goods and services. The innovation (new or improved) must be new to your enterprise, but it does not need to be new to your industry sector or market. It does not matter if the innovation was originally developed by your enterprise or by other enterprises. Exclude purely organisational innovations such as changes in firm structure or management practice – these are covered in question 10.

3.1 During the three years 2005 to 2007, did your enterprise introduce any:

	Yes	No
→ New or significantly improved methods of manufacturing or producing goods or services?	☐	☐
→ New or significantly improved logistics, delivery or distribution methods for your inputs, goods or service?	☐	☐
→ New or significantly improved supporting activities for your processes, such as maintenance and operating systems for purchasing, accounting or computing?	☐	☐

↳ If no to **all** questions, please go to section **4**

3.2 By whom were these process innovations developed?

→ Mainly your enterprise or enterprise group ☐
→ Your enterprise together with other enterprises or institutions ☐
→ Mainly other enterprises or institutions ☐

Select the single most appropriate option only

3.2.1 Did these innovations originate mainly in South Africa or abroad?

South Africa	Abroad
☐	☐

4. Ongoing or abandoned innovation activities

Innovation activities include the acquisition of machinery, equipment, software, licenses, engineering and development work, training, marketing and research and experimental development (R&D) when they are specifically undertaken to develop and/or implement a product or process innovation.

4.1 Did your enterprise have any innovation activities to develop product or process innovations that were abandoned during 2005 to 2007 or still ongoing by the end of 2007?

	Yes	No
Abandoned	☐	☐
Still ongoing	☐	☐

↳ If your enterprise also had no product or process innovations or innovation activity during 2005 to 2007 (no to **ALL** options in questions 2.1, 3.1, and 4.1), please go to question **8.2**. Otherwise, please proceed to question 5.1.

South African National Innovation Survey 2008

5. Innovation activities and expenditures

5.1 During the three years 2005 to 2007, did your enterprise engage in the following innovation activities?

	Yes	No
A. Intramural (in-house) Research and Experimental Development (R&D) Creative work undertaken on a systematic basis within your enterprise to increase the stock of knowledge and its use to devise new and improved products and processes (including software development).	☐	☐
B. Extramural or outsourced R&D Same activities as above, but purchased by your enterprise and performed by other companies (including other enterprises within your group) or by public or private research organisations.	☐	☐
C. Acquisition of machinery, equipment and software Acquisition of advanced machinery, equipment and computer hardware or software to produce new or significantly improved products and processes.	☐	☐
D. Acquisition of other external knowledge Purchase or licensing of patents and non-patented inventions, know-how, and other types of knowledge from other enterprises or organisations.	☐	☐
E. Training Internal or external training for your personnel specifically for the development and/or introduction of new or significantly improved products and processes.	☐	☐
F. Market introduction of innovations Activities for the market introduction of your new or significantly improved goods and services, including market research and launch advertising.	☐	☐
G. Other activities (including design) Procedures and technical preparations, including design, to implement new or significantly improved products and processes that are not covered elsewhere.	☐	☐

If yes, did your firm perform R&D during 2005 to 2007: Continuously ☐ Occasionally ☐

South African National Innovation Survey 2008

5.2 Please estimate the amount of expenditure in 2007 only for the first four innovation activities mentioned in 5.1 (A to D).

Include personnel and related costs.

Please provide expenditure in thousands of Rands e.g. Five hundred thousand Rand or R500 000 should be entered as 500 in the box provided: 5 0 0 000 = R500 000.

Please enter 0 in the category box if your enterprise had no expenditures in 2007.

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Please report for 2007 only

A.	Intramural (in-house) R&D in 2007. *Include labour costs, capital expenditures on buildings and equipment specifically for R&D.*	000
B.	Extramural or outsourced R&D.	000
C.	Acquisition of machinery, equipment and software. *Exclude expenditures on equipment for R&D.*	000
D.	Acquisition of other external knowledge.	000
	Total of these four innovation expenditure categories (A+B+C+D)	000

5.3 During the three years 2005 to 2007, did your enterprise receive any public financial support for innovation activities from the following levels of government?

Include financial support via tax credits or deductions, grants, subsidised loans, and loan guarantees.

Exclude research and other innovation activities conducted entirely for the public sector under contract.

	Yes	No
→ Metros and municipalities		
→ Provincial government		
→ National government		
→ National funding agencies (such as NRF, MRC, IDC)		
→ Foreign government / public sources (e.g. European Commission)		

South African National Innovation Survey 2008

6. Sources of information and co-operation for innovation activities

6.1 During the three years 2005 to 2007, how important to your enterprise's innovation activities were each of the following information sources?

Please identify information sources that provided information for new innovation projects or contributed to the completion of existing innovation projects.

INFORMATION SOURCE		DEGREE OF IMPORTANCE *Tick 'not used' if no information was obtained from a source.*			
		High	Medium	Low	Not used
Internal sources	Sources within your enterprise or enterprise group				
External sources					
Market resources	Suppliers of equipment, materials, components or software				
	Clients or customers				
	Competitors or other enterprises in your sector				
	Consultants, commercial labs or private R&D institutes				
Institutional sources	Universities / higher education institutions				
	Government or public research institutes				
Other sources	Conferences, trade fairs, exhibitions				
	Scientific journals and trade/technical publications				
	Professional and industry associations				

6.2 During the three years 2005 to 2007, did your enterprise co-operate on any of your innovation activities with other enterprises or institutions?

Innovation co-operation is active participation with other enterprises or non-commercial institutions on innovation activities. Both partners do not need to benefit commercially.

Exclude pure contracting out of work with no active co-operation.

Yes ☐ No ☐

↳ If no, please go to question 7.1

South African National Innovation Survey 2008

6.3 Please indicate the type of co-operation partner and their location. *Tick all that apply.*

TYPE OF CO-OPERATION PARTNER	South Africa	Rest of Africa	Europe	USA	Asia	Other countries
A. Other enterprises within your enterprise group	☐	☐	☐	☐	☐	☐
B. Suppliers of equipment, materials, components or software	☐	☐	☐	☐	☐	☐
C. Clients or customers	☐	☐	☐	☐	☐	☐
D. Competitors or other enterprises in your sector	☐	☐	☐	☐	☐	☐
E. Consultants, commercial labs or private R&D institutes	☐	☐	☐	☐	☐	☐
F. Universities / higher education institutions	☐	☐	☐	☐	☐	☐
G. Government or public research institutes (e.g. CSIR)	☐	☐	☐	☐	☐	☐

6.4 Which type of co-operation partner was the most valuable for your enterprise's innovation activities?
Give corresponding letter from 6.3. For example, customers = G ☐

7. Effects of innovation during 2005 to 2007

7.1 How successful were each of the following types of outcomes for your products (goods or services) and process innovations introduced during the three years 2005 to 2007? *Tick "Not relevant" if there were no innovation outcomes.*

		LEVEL OF SUCCESS OF OUTCOMES			
		High	Medium	Low	Not relevant
Product outcomes	Increased range of goods or services	☐	☐	☐	☐
	Entered new markets or increased market share	☐	☐	☐	☐
	Improved quality of goods or services	☐	☐	☐	☐
Process outcomes	Improved flexibity of production or service provision	☐	☐	☐	☐
	Increased capacity of production or service provision	☐	☐	☐	☐
	Reduced labour costs per unit output	☐	☐	☐	☐
	Reduced materials and energy per unit output	☐	☐	☐	☐
Other outcomes	Reduced environmental impacts or improved health and safety	☐	☐	☐	☐
	Met governmental regulatory requirements	☐	☐	☐	☐

South African National Innovation Survey 2008

8. Factors hampering innovation activities

8.1 During the three years 2005 to 2007, were any of your innovation activities or projects:

	Yes	No
→ Abandoned in the concept stage	☐	☐
→ Abandoned after the activity or project was begun	☐	☐
→ Seriously delayed	☐	☐

QUESTIONS 8.2, 9 and 10 TO BE ANSWERED BY ALL ENTERPRISES:

8.2 During the three years 2005 to 2007, how important were the following factors in hampering your innovation activities or projects or influencing a decision not to innovate? *Please also indicate particular factors that were not experienced.*

		DEGREE OF IMPORTANCE			
		High	Medium	Low	Factor not experienced
Cost factors	Lack of funds within your enterprise or group	☐	☐	☐	☐
	Lack of finance from sources outside your enterprise	☐	☐	☐	☐
	Innovation costs too high	☐	☐	☐	☐
Knowledge factors	Lack of qualified personnel	☐	☐	☐	☐
	Lack of information on technology	☐	☐	☐	☐
	Lack of information on markets	☐	☐	☐	☐
	Difficulty in finding co-operation partners for innovation	☐	☐	☐	☐
Market factors	Market dominated by established enterprises	☐	☐	☐	☐
	Uncertain demand for innovative goods or services	☐	☐	☐	☐
Reasons not to innovate	No need due to prior innovations	☐	☐	☐	☐
	No need because of no demand for innovations	☐	☐	☐	☐

9. Intellectual property rights

9.1 During the three years 2005 to 2007, did your enterprise:

	Yes	No
→ Secure a patent in South Africa?		
→ Apply for a patent outside of South Africa?		
→ Register an industrial design?		
→ Register a trademark?		
→ Claim copyright?		
→ Grant a licence on any intellectual property rights resulting from innovation?		

10. Organisational and marketing innovations

An organisational innovation is the implementation of new or significant changes in firm structure or management methods that are intended to improve your firm's use of knowledge, the quality of your goods and services, or the efficiency of work flows.

A marketing innovation is the implementation of new or significantly improved designs or sales methods to increase the appeal of your goods and services or to enter new markets.

10.1 During the three years 2005 to 2007, did your enterprise introduce:

	Yes	No
Organisational innovations		
→ New or significantly improved knowledge management systems to better use or exchange information, knowledge and skills within your enterprise *Exclude routine upgrades.*		
→ Major changes to the organisation of work within your enterprise, such as changes in the management structure or integrating different departments or activities		
→ New or significant changes in your external relations with other firms or public institutions, such as through alliances, partnerships, outsourcing or sub-contracting		
Marketing innovations		
→ Significant changes to the design or packaging of a good or service *Exclude routine/seasonal changes such as clothing fashions.*		
→ New or significantly changed sales or distribution methods, such as internet sales, franchising, direct sales or distribution licenses.		

South African National Innovation Survey 2008

10.2 If your enterprise introduced an organisational innovation during the three years 2005 to 2007, how important were each of the following results?

	IMPORTANCE OF RESULTS			
	High	Medium	Low	Not relevant
→ Improved market share				
→ Reduced time to respond to customer or supplier needs				
→ Improved quality of your goods or services				
→ Reduced costs per unit output				
→ Improved employee satisfaction and/or reduced rates of employee turnover				

11. Specific Innovations by your enterprise

11.1 During the three years 2005 to 2007, were any of your new or significantly improved products or processes

	Yes	No	Don't know
A first in South Africa?			
A world first?			

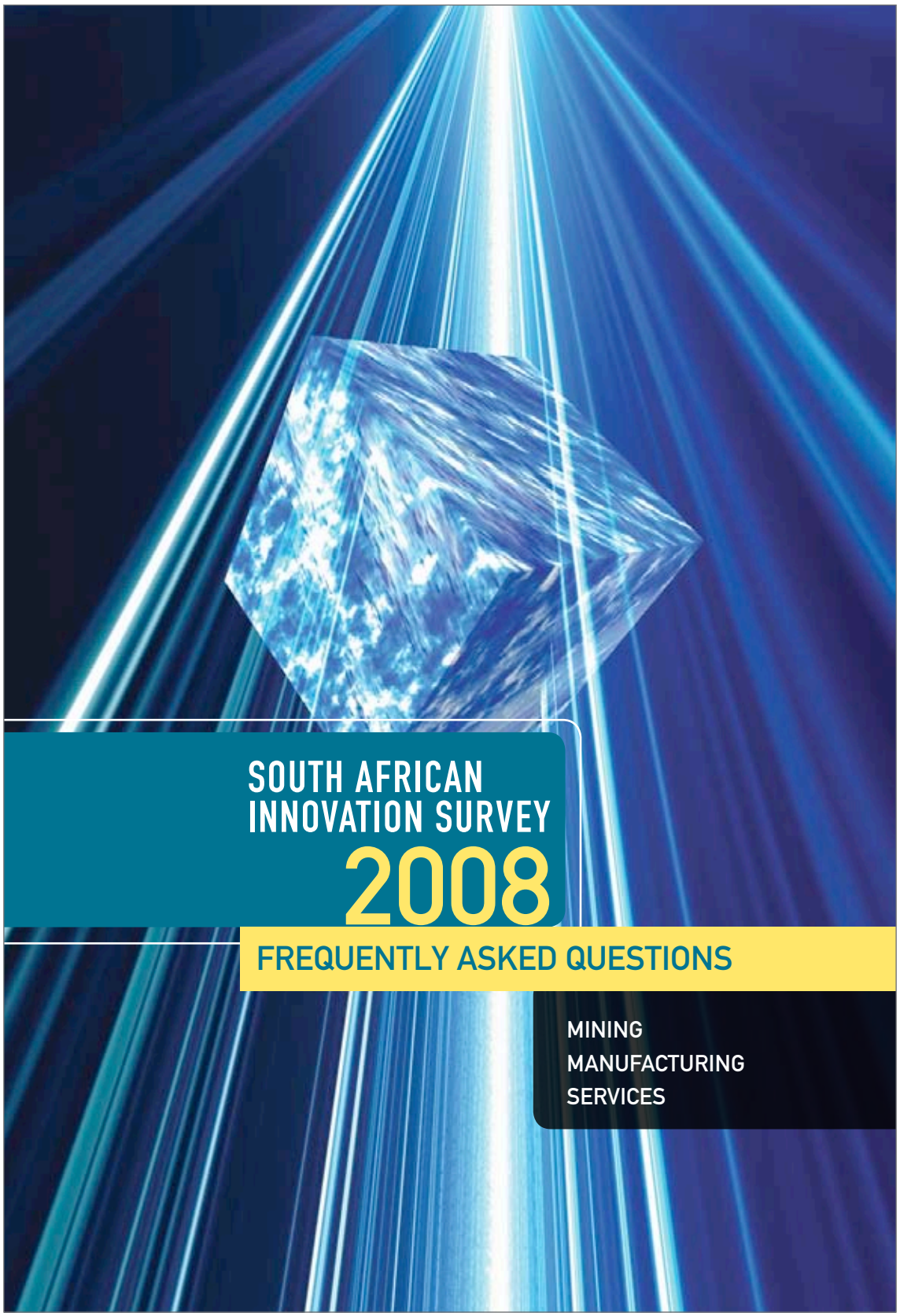
11.2 If your answer to Question 11.1 was yes then please give short descriptions of these innovations (or attach separate pages or promotional brochures)

11.3 Please list other significant examples of innovations in your enterprise in the last three years (or attach separate pages or promotional brochures, etc.)

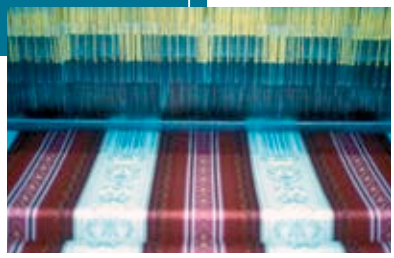
- Thank you for your participation. It is sincerely appreciated.
- Please make a copy of this questionnaire for your records and internal use which may also be referenced if we need to follow-up with any specific issues.
- Please return the completed questionnaire to the HSRC in the enclosed stamped, addressed envelope.
- Our postal address: Centre for Science, Technology and Innovation Indicators (CeSTII), Knowledge Systems Group
  Human Sciences Research Council, Private Bag X2, Vlaeberg, 8018

E-mail : innovation@hsrc.ac.za Website : www.hsrc.ac.za

Appendix 4


SOUTH AFRICAN
INNOVATION SURVEY
2008
FREQUENTLY ASKED QUESTIONS
MINING
MANUFACTURING
SERVICES

GENERAL QUESTIONS ABOUT THE SURVEY



1 | What is the purpose of this survey?

The Innovation Survey will provide an internationally comparable report on innovation activities in the mining, manufacturing and services (including wholesale and retail trade) sectors of South Africa. The Department of Science and Technology has commissioned the survey and will use the results to improve policy and support measures for innovation in the economy.

2 | What will my business gain from completing the survey?

The published results of the Innovation Survey will offer your enterprise the opportunity to benchmark your activities against those of other enterprises in your sector or industry, both nationally and internationally. Such benchmarking is a valuable measure of the overall position of your company. The added benefit of completing the survey is the opportunity for an internal evaluation of potential development areas that might otherwise not have been explored. The collective benefit is thus twofold. In short, the survey highlights internal development needs that could secure a stronger relative position for your business in its sector.

3 | Why has my company been selected?

For the survey on innovation, Statistics South Africa has drawn a random sample of firms from the official business register in accordance with the Memorandum of Agreement on official national statistics with the Department of Science and Technology. This sample consists of a variety of businesses, ranging from very small to very large firms, that operate in the services, mining and manufacturing sectors.

4 | What will my company information be used for?

The Innovation Survey collects data from the individual firms that have been randomly selected. The data provided by each firm will become part of the overall aggregated result for the sector. Only these aggregated results will be published, and no data on individual firms will be made public or disclosed to a third party in any way.

Your firm is one of the firms included in this random sample.

5 | What if I need someone who speaks my mother tongue to assist me in answering the questions?

A survey call centre has been established to support this survey. Survey call centre staff are in place to deal with the questions and concerns of respondents.

innovation 1 SURVEY

Should you need to speak to one of the call centre staff in your mother tongue regarding the survey, they will gladly assist you in any of the following languages: English, Afrikaans, IsiXhosa, Sesotho, IsiZulu, Northern Sotho or Setswana.

6 | What if I do not wish to participate?

The Innovation Survey falls within the scope of the Memorandum of Agreement between Statistics South Africa and the Department of Science and Technology and is therefore an official survey. The Innovation Survey is being undertaken in such a way that the results will be comparable with those of European Union and other countries. In order for South Africa to achieve such comparability, the response rate for the survey must be at least 71%. It is extremely important that we are able to compare our economic status with those of other countries, and we are doing our utmost to ensure that we achieve the 71% response rate. The main function of the survey call centre is to boost the response rate by following up each targeted respondent and ensuring that each survey questionnaire is returned, complete with all the data requested.

7 | What are the criteria for deciding whether a change is an innovation?

In deciding whether an activity should be considered an innovation, two central criteria must be considered:
– Does the product or activity represent significant change or improvement?

AND/OR

– Is the activity or product new to the firm?

If the change meets either of these criteria, it can be considered an innovation.

8 | I own a very small business. Is this survey intended for me?

Yes, the Innovation Survey aims to cover the

GENERAL QUESTIONS REGARDING INNOVATION

innovation activities of small, medium and large enterprises in each of the sectors. It is very important for the outcome of the survey that small businesses complete the questionnaire.

9 | What do these criteria mean?

With the above two criteria in mind, it is clear that a given change could be an innovation for one firm, while the same change may not be an innovation for another firm. Each firm thus has to decide for itself whether any particular change is new to the firm and/or whether the product, process or service has been significantly changed.

10 | How many types of innovation are there, and what are they?

- The Innovation Survey recognises four types of innovation in firms:
- Product innovation (comprising both goods and services)
- Process innovation
- Organisational innovation
- Marketing innovation.

11 | When does an innovation belong to my firm?

An enterprise can consider an innovation to be its own under the following circumstances:

- When the enterprise has implemented a new or significantly improved change, which may have originated elsewhere, such as your head office or a subsidiary company, another company, sector or country
- When your enterprise has internally developed and implemented its own significant changes
- When your enterprise has significantly improved or modified existing products, processes, services, methods or delivery processes, either by internal development or by introducing a new idea from external sources.

In short, an innovation belongs to your enterprise when the change is new or significantly improved.

INNOVATION EXPENDITURE

12 | How do I report expenditure data?

We request that you provide financial data for the financial year 2007/08. However, if financial data are not available for 2007, please provide estimates of the financial data for the latest financial year.

All financial data that you provide must be based on only one financial year.

We also remind you that all data provided in this section are kept strictly confidential and not made public in any way. All survey staff have signed strict agreements on the confidentiality of the data.

FOUR TYPES OF INNOVATION

1 PRODUCT INNOVATION

13 | What is a 'product innovation'?

Product innovation relates to both goods and services. When a good or service is introduced to the firm and:

– Is new to that firm

OR

– Shows significant improvement with respect to the capabilities or planned uses, then the change represents a product innovation. This may include significant changes in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics of the good or service.

14 | What are some examples of product innovations that relate to goods and services in my sector?

MINING:

Goods:

– Improved purity of final mining product

Services:

– New information technology applications in serving mine clients

MANUFACTURING:

Goods:

– Change of materials in goods, e.g. breathable textiles
– New type of paper for specific printers

Services:

– Introduction of lifelong guarantees on new or used products
– Remote maintenance

SERVICES:

Goods:

– Introduction of central cards that enable direct clearance with hospitals
– Anti-fraud software that profiles and tracks individual transactions

FOUR TYPES OF INNOVATION

1 PRODUCT INNOVATION

Services:
- New or significantly improved insurance services
- Introduction of modular life insurance concepts
- Ticket automation for cash or pay cards
- Remote software maintenance

WHOLESALE AND RETAIL TRADE:

Goods:
- Including eco-friendly products in the products range
- Introduction of client or loyalty cards

Services:
- New kinds of certification services
- Combining solutions, e.g. technical and consulting services in one
- Introducing client card systems
- Sales via the Internet or direct sales to end-user

15 | What, for example, would not be considered a product innovation?

- Design changes that do not alter the function or technical characteristics of a good or service
- Routine upgrades
- Minor changes or improvements
- Customisation for a single client that does not include significantly different attributes compared to products made for other clients

2 PROCESS INNOVATION

16 | What is a 'process innovation'?

For the purpose of this survey, a process innovation relates to improvements in production methods, delivery methods or distribution methods. For these improvements to be considered innovations, they must be:
- New to the firm

OR
- Significantly improved.

These significant changes include those that relate to:
- Specific techniques
- Equipment and/or software
- Changes that are intended to improve the quality, efficiency or flexibility of a production or supply activity or logistics
- Changes that reduce environmental or safety hazards

17 | What are some examples of process innovations for my sector?

MINING:
- Introducing clean technology applications in ore extraction
- New methods that significantly reduce hazardous environmental waste

Table A1.1 Number and percentage of enterprises, 2005 - 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Type of product innovation										
All enterprises	***22 849***	**12 399**	214	12 094	91	**10 450**	8 685	1 296	89	379
Enterprises with innovation activity	***14 934***	**8 530**	118	8 358	54	**6 404**	5 386	740	29	249
Product only innovators	***2 031***	**945**	0	945	0	**1 086**	1 033	8	0	45
Process only innovators	***2 356***	**562**	61	501	0	**1 794**	1 521	257	0	16
Product and process innovators	***1 815***	**1 086**	0	1 086	0	**729**	661	45	1	22
Enterprises with on-going and/or abandoned innovations	***8 731***	**5 937**	57	5 825	54	**2 795**	2 172	430	28	166
Enterprises without innovation activity	***7 915***	**3 869**	96	3 736	36	**4 046**	3 299	557	60	131
Percentage of enterprises (%)										
Type of product innovation										
All enterprises	***100.0***	**100.0**	100.0	100.0	100.0	**100.0**	100.0	100.0	100.0	100.0
Enterprises with innovation activity	***65.4***	**68.8**	55.0	69.1	59.9	**61.3**	62.0	57.1	32.5	65.6
Product only innovators	***8.9***	**7.6**	0.0	7.8	0.0	**10.4**	11.9	0.6	0.0	11.8
Process only innovators	***10.3***	**4.5**	28.4	4.1	0.0	**17.2**	17.5	20.1	0.0	4.3
Product and process innovators	***7.9***	**8.8**	0.0	9.0	0.0	**7.0**	7.6	3.5	1.3	5.7
Enterprises with on-going and/or abandoned innovations	***38.2***	**47.9**	26.6	48.2	59.9	**26.7**	25.0	32.9	31.1	43.8
Enterprises without innovation activity	***34.6***	**31.2**	45.0	30.9	40.1	**38.7**	38.0	42.9	67.5	34.4

Table A1.2 Summary of number and percentage of enterprises, 2005 - 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
All enterprises	***22 849***	**12 399**	214	12 094	91	**10 450**	8 685	1 296	89	379
Enterprises with innovation activity	***14 934***	**8 530**	118	8 358	54	**6 404**	5 386	740	29	249
Enterprises without innovation activity	***7 915***	**3 869**	96	3 736	36	**4 046**	3 299	557	60	131
Percentage of enterprises (%)										
All enterprises	***100.0***	**100.0**	100.0	100.0	100.0	**100.0**	100.0	100.0	100.0	100.0
Enterprises with innovation activity	***65.4***	**68.8**	55.0	69.1	59.9	**61.3**	62.0	57.1	32.5	65.6
Enterprises without innovation activity	***34.6***	**31.2**	45.0	30.9	40.1	**38.7**	38.0	42.9	67.5	34.4

Table A1.3 Innovation activities , 2005 - 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Type of innovation										
Goods Innovation	***8 703***	**5 947**	14	5 882	51	**2 756**	2 543	87	18	109
Services Innovation	***7 794***	**4 343**	12	4 317	14	**3 451**	2 886	341	23	201
Product Innovation	***11 612***	**7 205**	18	7 133	54	**4 407**	3 820	349	24	214
Process Innovation	***11 352***	**6 415**	118	6 249	48	**4 937**	4 022	731	28	156
Percentage of innovative enterprises (%)										
Type of innovation										
Goods Innovation	***58.3***	***69.7***	12.1	70.4	93.9	***43.0***	47.2	11.7	61.8	43.6
Services Innovation	***52.2***	***50.9***	10.3	51.7	26.2	***53.9***	53.6	46.1	78.3	80.8
Product Innovation	***77.8***	***84.5***	15.1	85.3	100.0	***68.8***	70.9	47.2	82.4	86.1
Process Innovation	***76.0***	***75.2***	100.0	74.8	88.8	***77.1***	74.7	98.9	95.9	62.6

Table A2 Number and percentage of employees, 2007 (year specific question)

Number of employees	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
All enterprises	***3 520 608***	**1 734 769**	301 839	1 415 839	17 091	**1 785 839**	846 407	794 336	130 707	14 390
Enterprises with innovation activity	***3 249 997***	**1 574 340**	293 452	1 265 214	15 673	**1 675 657**	757 692	775 568	130 104	12 293
Enterprises without innovation activity	***270 611***	**160 429**	8 387	150 625	1 418	**110 182**	88 715	18 767	603	2 096
Percentage of all employees (%)										
All enterprises	***100.0***	**100.0**	100.0	100.0	100.0	**100.0**	100.0	100.0	100.0	100.0
Enterprises with innovation activity	***92.3***	**90.8**	97.2	89.4	91.7	**93.8**	89.5	97.6	99.5	85.4
Enterprises without innovation activity	***7.7***	**9.2**	2.8	10.6	8.3	**6.2**	10.5	2.4	0.5	14.6

Table A3 Turnover, 2007 (year specific question)

	Total	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Turnover (R millions)										
All enterprises	***3 311 201***	**1 508 326**	194 883	1 299 604	13 840	**1 802 875**	1 135 114	529 070	131 266	7 424
Enterprises with innovation activity	***2 825 081***	**1 259 965**	193 688	1 053 622	12 654	**1 565 116**	986 631	446 425	125 794	6 267
Enterprises without innovation activity	***486 120***	**248 362**	1 195	245 982	1 185	**237 758**	148 483	82 645	5 472	1 158
Percentage of total turnover (%)										
All enterprises	***100.0***	**100.0**	100.0	100.0	100.0	**100.0**	100.0	100.0	100.0	100.0
Enterprises with innovation activity	***85.3***	**83.5**	99.4	81.1	91.4	**86.8**	86.9	84.4	95.8	84.4
Enterprises without innovation activity	***14.7***	**16.5**	0.6	18.9	8.6	**13.2**	13.1	15.6	4.2	15.6

Table A4.1 Enterprises with innovation activities: expenditure on innovation, 2007 (year specific question)

	Total	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Type of expenditure (R millions)										
Intramural (in-house) R&D in 2007	***12 098***	**6 719**	292	6 376	50	**5 379**	1 283	3 088	54	954
Extramural or outsourced R&D	***6 479***	**2 240**	99	2 135	6	**4 239**	735	3 481	2	22
Acquisition of machinery, equipment and software	***33 920***	**17 520**	3 486	13 820	215	**16 400**	13 027	3 192	140	41
Acquisition of other external knowledge	***4 461***	**538**	23	511	3	**3 923**	1 630	2 283	2	8
Total Expenditure	***56 959***	**27 018**	3 901	22 842	275	**29 941**	16 675	12 043	198	1 025
Type of expenditure (%)										
Intramural (in-house) R&D in 2007	***21.2***	**24.9**	7.5	27.9	18.3	**18.0**	7.7	25.6	27.5	93.0
Extramural or outsourced R&D	***11.4***	**8.3**	2.5	9.3	2.3	**14.2**	4.4	28.9	0.9	2.1
Acquisition of machinery, equipment and software	***59.6***	**64.8**	89.4	60.5	78.1	**54.8**	78.1	26.5	70.8	4.0
Acquisition of other external knowledge	***7.8***	**2.0**	0.6	2.2	1.2	**13.1**	9.8	19.0	0.8	0.8

Table A4.2 Number and percentage of innovative enterprises having engaged in specific innovation expenditure, 2007 (year specific question)

	Total	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Type of expenditure (number of innovative enterprises)										
Intramural (in-house) R&D in 2007	***6 735***	**4 588**	23	4 522	44	**2 147**	1 875	113	27	132
Extramural or outsourced R&D	***2 680***	**1 904**	20	1 874	9	**776**	641	88	12	34
Acquisition of machinery, equipment and software	***9 805***	**6 101**	109	5 954	38	**3 704**	3 358	169	21	156
Acquisition of other external knowledge	***2 598***	**2 114**	35	2 069	9	**484**	308	61	7	108
Type of expenditure (% of innovative enterprises)										
Intramural (in-house) R&D in 2007	***45.1***	**53.8**	19.1	54.1	80.6	**33.5**	34.8	15.3	91.8	53.1
Extramural or outsourced R&D	***17.9***	**22.3**	17.2	22.4	17.3	**12.1**	11.9	11.9	42.3	13.8
Acquisition of machinery, equipment and software	***65.7***	**71.5**	92.9	71.2	69.3	**57.8**	62.3	22.9	74.2	62.6
Acquisition of other external knowledge	***17.4***	**24.8**	30.0	24.8	17.3	**7.6**	5.7	8.2	24.8	43.5

Table A5.1 Product (goods and services) innovators: number breakdown of turnover by product type, 2007 (year specific question)

	Total	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Turnover breakdown (R millions)										
All Product innovators	***2 471 036***	**1 050 252**	**60 020**	**977 577**	**12 654**	**1 420 784**	**895 556**	**434 985**	**84 667**	**5 577**
Innovations new to the market	***209 505***	**94 834**	847	91 669	2 318	**114 671**	85 671	1 783	26 420	797
Innovations new to the firm	***160 466***	**46 498**	2 855	41 657	1 986	**113 968**	88 812	8 067	16 055	1 034
Unchanged or marginally modified	***2 101 065***	**908 920**	56 318	844 251	8 351	**1 192 145**	721 072	425 136	42 191	3 746

Product only innovators	***59 515***	**32 352**	**0**	**32 352**	**0**	**27 164**	**26 439**	**84**	**0**	**641**
Innovations new to the market	***11 074***	**9 981**	0	9 981	0	**1 093**	1 018	50	0	25
Innovations new to the firm	***8 610***	**4 263**	0	4 263	0	**4 346**	4 235	25	0	86
Unchanged or marginally modified	***39 832***	**18 108**	0	18 108	0	**21 724**	21 186	8	0	530
Product and Process innovators	***263 892***	**60 657**	**0**	**60 657**	**0**	**203 235**	**200 267**	**1 228**	**1 519**	**221**
Innovations new to the market	***15 762***	**7 370**	0	7 370	0	**8 393**	6 892	90	1 367	44
Innovations new to the firm	***17 857***	**5 213**	0	5 213	0	**12 645**	12 540	94	0	11
Unchanged or marginally modified	***230 273***	**48 075**	0	48 075	0	**182 197**	180 835	1 044	152	166

Table A5.2 Product (goods and services) innovators: percentage breakdown of turnover by product type, 2007 (year specific question)

	Total	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Turnover breakdown (% of total turnover)										
All Product innovators	***100.0***	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Innovations new to the market	***8.5***	**9.0**	1.4	9.4	18.3	**8.1**	9.6	0.4	31.2	14.3
Innovations new to the firm	***6.5***	**4.4**	4.8	4.3	15.7	**8.0**	9.9	1.9	19.0	18.5
Unchanged or marginally modified	***85.0***	**86.5**	93.8	86.4	66.0	**83.9**	80.5	97.7	49.8	67.2
Product only innovators	***100.0***	**100.0**	**0.0**	**100.0**	**0.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Innovations new to the market	***18.6***	**30.9**	0.0	30.9	0.0	**4.0**	3.8	60.0	**0.0**	3.9
Innovations new to the firm	***14.5***	**13.2**	0.0	13.2	0.0	**16.0**	16.0	30.0	0.0	13.4
Unchanged or marginally modified	***66.9***	**56.0**	0.0	56.0	0.0	**80.0**	80.1	10.0	0.0	82.7
Product and Process innovators	***100.0***	**100.0**	**0.0**	**100.0**	**0.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Innovations new to the market	***6.0***	**12.1**	0.0	12.1	0.0	**4.1**	3.4	7.3	90.0	19.8
Innovations new to the firm	***6.8***	**8.6**	0.0	8.6	0.0	**6.2**	6.3	7.7	0.0	4.9
Unchanged or marginally modified	***87.3***	**79.3**	0.0	79.3	0.0	**89.6**	90.3	85.0	10.0	75.3

Table A6 Innovative enterprises: responsibility for the development of product innovations, 2005 - 2007

Total number of innovative enterprises	***Total***	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Responsibility for development of product innovation										
All Innovative enterprises	***11 612***	**7 205**	18	7 133	54	**4 407**	3 820	349	24	214
Mainly own enterprise	***7 409***	**4 872**	7	4 820	45	**2 537**	2 136	257	18	126
Own enterprise in collaboration with other enterprises or institutions	***1 862***	**1 042**	9	1 023	9	**820**	708	52	5	56
Other enterprises or institution	***2 342***	**1 292**	2	1 290	0	**1 050**	976	41	1	32
Enterprises which did not respond to the question	***0***	**0**	0	0	0	**0**	0	0	0	0
Percentage of innovative enterprises (%)										
Responsibility for development of product innovation										
All innovative enterprises	***100.0***	**100.0**	100.0	100.0	100.0	**100.0**	100.0	100.0	100.0	100.0
Mainly own enterprise	***63.8***	**67.6**	37.1	67.6	82.7	**57.6**	55.9	73.4	75.0	59.0
Own enterprise in collaboration with other enterprises or institutions	***16.0***	**14.5**	53.0	14.3	17.3	**18.6**	18.5	14.8	20.0	26.1
Other enterprises or institution	***20.2***	**17.9**	9.9	18.1	0.0	**23.8**	25.5	11.8	5.0	14.9
Enterprises which did not respond to the question	***0.0***	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0

Table A7 Origin of product innovation, 2005 - 2007

Number of innovative enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Origin of innovation										
All innovative enterprises	***11 612***	**7 205**	18	7 133	54	**4 407**	3 820	349	24	214
South Africa	***8 823***	**5 600**	18	5 539	43	**3 223**	2 782	263	21	157
Abroad	***2 783***	**1 605**	0	1 594	11	**1 178**	1 031	87	2	57
No response	***6***	**0**	0	0	0	**6**	6	0	0	0
Percentage of innovative enterprises (%)										
Origin of innovation										
All innovative enterprises	***100.0***	**100.0**	100.0	100.0	100.0	**100.0**	100.0	100.0	100.0	100.0
South Africa	***76.0***	**77.7**	100.0	77.7	79.9	**73.1**	72.8	75.2	90.0	73.3
Abroad	***24.0***	**22.3**	0.0	22.3	20.1	**26.7**	27.0	24.8	10.0	26.7
No response	***0.1***	**0.0**	0.0	0.0	0.0	**0.1**	0.2	0.0	0.0	0.0

Table A8.1 'Highly important' effects of innovation on outcomes for enterprises (number), 2005 - 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Product Outcomes										
Increased range of goods and services	***4 664***	**2 999**	12	2 958	28	**1 665**	1 252	303	25	85
Entered new markets or increased market share	***2 540***	**2 151**	8	2 119	23	**389**	268	36	17	68
Improved quality of goods or services	***4 579***	**2 471**	14	2 419	37	**2 108**	1 691	306	11	100
Process outcomes										
Improved flexibility of production or service provision	***2 356***	**1 719**	7	1 696	17	**636**	509	26	21	81
Increased capacity of production or service provision	***3 829***	**2 982**	24	2 942	17	**847**	725	26	17	79
Reduced labour costs per unit output	***1 325***	**1 000**	2	982	17	**325**	278	19	2	25
Reduced materials and energy per unit output	***1 722***	**1 076**	2	1 054	20	**646**	626	10	1	9
Other Outcomes										
Reduced environmental impacts or improved health and safety	***938***	**540**	17	520	3	**398**	342	24	1	31
Met governmental regulatory requirements	***2 348***	**1 415**	7	1 399	8	**933**	769	84	18	63

Table A8.2 'Highly important' effects of innovation on oucomes for enterprises (%), 2005 - 2007

Percentage of enterprises (%)	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Product Outcomes										
Increased range of goods and services	***31.2***	**35.2**	10.6	35.4	52.0	**26.0**	23.2	40.9	87.6	34.0
Entered new markets or increased market share	***17.0***	**25.2**	7.1	25.4	43.1	**6.1**	5.0	4.9	57.7	27.2
Improved quality of goods or services	***30.7***	**29.0**	12.1	28.9	68.6	**32.9**	31.4	41.4	38.2	40.3
Process Outcomes										
Improved flexibility of production or service provision	***15.8***	**20.2**	5.9	20.3	30.7	**9.9**	9.4	3.5	71.2	32.4
Increased capacity of production or service provision	***25.6***	**35.0**	20.2	35.2	30.7	**13.2**	13.5	3.6	57.7	31.7
Reduced labour costs per unit output	***8.9***	**11.7**	1.5	11.7	30.7	**5.1**	5.2	2.6	8.2	10.1
Reduced materials and energy per unit output	***11.5***	**12.6**	1.5	12.6	36.7	**10.1**	11.6	1.3	4.1	3.7
Other Outcomes										
Reduced environmental impacts or improved health and safety	***6.3***	**6.3**	14.0	6.2	6.1	**6.2**	6.3	3.3	4.1	12.3
Met governmental regulatory requirements	***15.7***	**16.6**	6.2	16.7	15.0	**14.6**	14.3	11.3	61.8	25.2

Table A9.1 Enterprises with innovation activity: number of enterprises that introduced new goods or services, 2005 - 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
All Product Innovators										
Introduced new goods	***8 703***	**5 947**	14	5 882	51	**2 756**	2 543	87	18	109
Introduced new services	***7 794***	**4 343**	12	4 317	14	**3 451**	2 886	341	23	201
Product only innovators										
Introduced new goods	***1 828***	**1 040**	0	1 034	6	**788**	733	8	1	46
Introduced new services	***2 533***	**1 407**	0	1 407	0	**1 126**	1 032	0	1	93
Product and process innovators										
Introduced new goods	***6 874***	**4 907**	14	4 847	45	**1 968**	1 810	79	17	62
Introduced new services	***5 261***	**2 936**	12	2 910	14	**2 325**	1 854	341	21	108

Table A9.2 Enterprises with innovation activity: percentage of enterprises that introduced new goods or services, 2005 - 2007

Proportion of enterprises (%)	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
All Product Innovators										
Introduced new goods	***58.3***	**69.7**	12.1	70.4	93.9	**43.0**	47.2	11.7	61.8	43.6
Introduced new services	***52.2***	**50.9**	10.3	51.7	26.2	**53.9**	53.6	46.1	78.3	80.8
Product only innovators										
Introduced new goods	***12.2***	**12.2**	0.0	12.4	11.0	**12.3**	13.6	1.1	3.5	18.5
Introduced new services	***17.0***	**16.5**	0.0	16.8	0.0	**17.6**	19.2	0.0	3.5	37.4
Product and process innovators										
Introduced new goods	***46.0***	**57.5**	12.1	58.0	82.7	**30.7**	33.6	10.6	57.7	25.0
Introduced new services	***35.2***	**34.4**	10.3	34.8	26.2	**36.3**	34.4	46.1	74.2	43.4

Table A10.1 Innovative enterprises that received financial support for innovation activities from government sources (number), 2005 - 2007

Number of innovative enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Enterprises with innovation activity	***574***	**418**	5	404	9	**156**	124	10	1	21
Successful innovators	***43***	**26**	0	26	0	**17**	13	4	0	0
Enterprises with only on-going and/or abandoned innovations	***533***	**392**	5	377	9	**142**	114	6	1	21

Table A10.2 Innovative enterprises that received financial support for innovation activities from government sources (%), 2005 – 2007

Percentage of innovative enterprises (%)	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Enterprises with innovation activity	***3.8***	**4.9**	4.3	4.8	17.3	**2.4**	2.3	1.4	4.1	8.3
Successful innovators	***0.3***	**0.3**	0.0	0.3	0.0	**0.3**	0.2	0.5	0.0	0.0
Enterprises with only on-going and/or abandoned innovations	***3.6***	**4.6**	4.3	4.5	17.3	**2.2**	2.1	0.8	4.1	8.3

Table A11.1 Sources of information for innovation rates as 'highly important' by innovative enterprises (number) 2005 - 2007

Number of innovative enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Internal Sources										
Sources within your enterprise or enterprise group	***6 234***	**3 740**	27	3 676	37	**2 494**	2 233	119	17	125
External - Market Resources										
Suppliers of equipment, materials, components or software	***3 180***	**1 528**	14	1 496	17	**1 652**	1 334	302	10	7
Clients or customers	***6 159***	**3 560**	31	3 490	39	**2 598**	2 186	321	23	69
Competitors or other enterprises in your sector	***1 704***	**986**	13	965	8	**718**	441	258	4	15
Consultants, commercial labs or private R&D institutes	***687***	**586**	7	576	3	**101**	49	8	1	43
External - Institutional Sources										
Universities and Technikons	***306***	**263**	5	255	3	**43**	13	2	5	24
Government and Public Research institutes	***228***	**191**	0	188	3	**36**	31	5	0	0
External - Other Sources										
Conferences, trade fairs, exhibitions	***1 993***	**1 094**	7	1 077	9	**899**	856	26	1	15
Scientific journals and trade/ technical publications	***1 507***	**1 399**	2	1 394	3	**108**	65	31	2	9
Professional and industry associations	***841***	**721**	7	704	9	**120**	85	10	4	22

Table A11.2 Sources of information for innovation rates as 'highly important' by innovative enterprises (%) 2005 - 2007										
Percentage of innovative enterprises (%)	***Total***	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Internal Sources										
Sources within your enterprise or enterprise group	***41.7***	**43.8**	22.6	44.0	68.6	**39.0**	41.5	16.1	58.8	50.2
External - Market Resources										
Suppliers of equipment, materials, components or software	***21.3***	**17.9**	12.0	17.9	31.9	**25.8**	24.8	40.8	34.1	2.7
Clients or customers	***41.2***	**41.7**	26.7	41.8	71.5	**40.6**	40.6	43.3	79.4	27.7
Competitors or other enterprises in your sector	***11.4***	**11.6**	11.0	11.5	15.0	**11.2**	8.2	34.9	12.4	6.2
Consultants, commercial labs or private R&D institutes	***4.6***	**6.9**	5.8	6.9	6.1	**1.6**	0.9	1.1	4.1	17.3
External - Institutional Sources										
Universities and Technikons	***2.1***	**3.1**	4.5	3.0	6.1	**0.7**	0.2	0.2	17.6	9.5
Government and Public Research institutes	***1.5***	**2.2**	0.0	2.2	6.1	**0.6**	0.6	0.7	0.0	0.0
External - Other Sources										
Conferences, trade fairs, exhibitions	***13.3***	**12.8**	6.2	12.9	17.3	**14.0**	15.9	3.5	4.1	6.2
Scientific journals and trade/ technical publications	***10.1***	**16.4**	1.5	16.7	6.1	**1.7**	1.2	4.2	8.2	3.7
Professional and industry associations	***5.6***	**8.4**	6.2	8.4	17.3	**1.9**	1.6	1.4	12.4	8.6

Table A12 Enterprises with innovation activity citing problems with their innovation activity, 2005 - 2007

	Total	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Problems cited										
Abandoned in the concept stage	***2 583***	**1 387**	21	1 361	6	**1 195**	1 045	83	6	61
Abandoned after the activity or project was begun	***1 444***	**1 121**	17	1 075	30	**323**	218	50	5	50
Seriously delayed	***2 585***	**1 694**	15	1 659	20	**891**	736	78	15	63
Percentage of innovative enterprises (%)										
Problems cited										
Abandoned in the concept stage	***17.3***	**16.3**	17.6	16.3	11.2	**18.7**	19.4	11.2	20.6	24.5
Abandoned after the activity or project was begun	***9.7***	**13.1**	14.2	12.9	54.4	**5.0**	4.0	6.8	16.5	20.2
Seriously delayed	***17.3***	**19.9**	12.9	19.8	37.4	**13.9**	13.7	10.5	50.5	25.1

Table A13.1 'Highly important' factors that hampered innovation activities on innovative enterprises (number), 2005 -2007

Number of innovative enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Cost Factors										
Lack of funds within your enterprise or group	***4 281***	**3 198**	7	3 180	11	**1 083**	823	146	19	95
Lack of finance from sources outside your enterprise	***2 452***	**1 978**	2	1 965	11	**474**	26	379	0	69
Innovation costs too high	***3 970***	**2 872**	59	2 802	11	**1 098**	972	43	13	70
Knowledge Factors										
Lack of qualified personnel	***2 609***	**1 932**	2	1 921	9	**677**	536	59	5	78
Lack of information on technology	***1 144***	**997**	0	997	0	**147**	13	118	0	16
Lack of information of markets	***1 432***	**976**	0	976	0	**457**	315	132	1	9
Difficulty in finding cooperation partners	***1 462***	**1 106**	4	1 093	9	**357**	308	4	12	33
Market Factors										
Market dominated by established enterprises	***2 904***	**1 520**	21	1 462	37	**1 384**	960	353	2	69
Uncertain demand for innovative goods or services	***1 421***	**1 313**	0	1 299	14	**108**	32	24	4	49
Reasons not to innovate										
No need due to prior innovations	***315***	**253**	0	253	0	**62**	39	6	0	17
No need because of no demand for innovations	***274***	**245**	0	245	0	**30**	18	11	0	0

Table A13.2 'Highly important' factors that hampered innovation activities on innovative enterprises (%), 2005 -2007

Percentage of enterprises (%)	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Cost Factors										
Lack of funds within your enterprise or group	***28.7***	**37.5**	6.2	38.0	20.1	**16.9**	15.3	19.7	67.0	38.1
Lack of finance from sources outside your enterprise	***16.4***	**23.2**	1.5	23.5	20.1	**7.4**	0.5	51.2	0.0	27.8
Innovation costs too high	***26.6***	**33.7**	50.4	33.5	20.1	**17.1**	18.0	5.8	45.3	28.1
Knowledge Factors										
Lack of qualified personnel	***17.5***	**22.6**	1.5	23.0	17.3	**10.6**	9.9	7.9	16.5	31.3
Lack of information on technology	***7.7***	**11.7**	0.0	11.9	0.0	**2.3**	0.2	16.0	0.0	6.4
Lack of information of markets	***9.6***	**11.4**	0.0	11.7	0.0	**7.1**	5.8	17.9	4.1	3.5
Difficulty in finding cooperation partners	***9.8***	**13.0**	3.0	13.1	17.3	**5.6**	5.7	0.5	41.2	13.2
Market Factors										
Market dominated by established enterprises	***19.4***	**17.8**	17.6	17.5	68.6	**21.6**	17.8	47.7	8.2	27.8
Uncertain demand for innovative goods or services	***9.5***	**15.4**	0.0	15.5	25.5	**1.7**	0.6	3.2	12.4	19.6
Reasons not to innovate										
No need due to prior innovations	***2.1***	**3.0**	0.0	3.0	0.0	**1.0**	0.7	0.8	0.0	6.8
No need because of no demand for innovations	***1.8***	**2.9**	0.0	2.9	0.0	**0.5**	0.3	1.5	0.0	0.0

Table A13.3 'Highly important' factors that hampered innovation activities on non-innovative enterprises (number), 2005 – 2007

Number of non-innovative enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Cost Factors										
Lack of funds within your enterprise or group	***2 067***	**1 184**	13	1 160	12	**883**	685	180	9	9
Lack of finance from sources outside your enterprise	***1 077***	**762**	0	753	9	**315**	240	54	9	13
Innovation costs too high	***1 466***	**945**	12	918	14	**521**	451	32	9	29
Knowledge Factors										
Lack of qualified personnel	***999***	**639**	8	622	8	**360**	6	334	0	21
Lack of information on technology	***546***	**330**	0	328	3	**216**	3	201	4	9
Lack of information of markets	***294***	**149**	0	145	4	**145**	104	32	0	9
Difficulty in finding cooperation partners	***464***	**332**	0	328	4	**131**	107	15	9	0
Market Factors										
Market dominated by established enterprises	***1 988***	**1 080**	14	1 056	9	**909**	828	76	0	4
Uncertain demand for innovative goods or services	***1 412***	**730**	14	714	3	**681**	607	54	0	21
Reasons not to innovate										
No need due to prior innovations	***915***	**427**	14	410	3	**488**	454	17	0	17
No need because of no demand for innovations	***4 622***	**2 111**	51	2 041	19	**2 511**	1 976	434	34	67

Table A13.4 'Highly important' factors that hampered innovation activities on non-innovative enterprises (%), 2005 - 2007

Percentage of non-innovative enterprises (%)	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Cost Factors										
Lack of funds within your enterprise or group	***26.1***	**30.6**	13.3	31.0	32.1	**21.8**	20.8	32.4	14.2	6.5
Lack of finance from sources outside your enterprise	***13.6***	**19.7**	0.0	20.2	25.7	**7.8**	7.3	9.6	14.2	10.0
Innovation costs too high	***18.5***	**24.4**	12.9	24.6	39.3	**12.9**	13.7	5.8	14.2	22.4
Knowledge Factors										
Lack of qualified personnel	***12.6***	**16.5**	8.7	16.7	22.5	**8.9**	0.2	59.9	0.0	16.2
Lack of information on technology	***6.9***	**8.5**	0.0	8.8	7.2	**5.3**	0.1	36.2	5.9	6.5
Lack of information of markets	***3.7***	**3.9**	0.0	3.9	11.3	**3.6**	3.2	5.8	0.0	6.5
Difficulty in finding cooperation partners	***5.9***	**8.6**	0.0	8.8	11.3	**3.2**	3.3	2.8	14.2	0.0
Market Factors										
Market dominated by established enterprises	***25.1***	**27.9**	14.4	28.3	26.1	**22.5**	25.1	13.7	0.0	3.4
Uncertain demand for innovative goods or services	***17.8***	**18.9**	14.4	19.1	7.2	**16.8**	18.4	9.6	0.0	16.2
Reasons not to innovate										
No need due to prior innovations	***11.6***	**11.0**	14.4	11.0	7.2	**12.1**	13.8	3.1	0.0	13.1
No need because of no demand for innovations	***58.4***	**54.6**	52.9	54.6	53.5	**62.1**	59.9	78.0	56.8	51.1

Table A14.1 Number of innovative and non-innovative enterprises that introduced organisational or marketing innovations, 2005 - 2007

Enterprises with innovation activity	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Organisational Innovations										
Knowledge management systems to better use or exchange information	***6 426***	**2 974**	73	2 881	20	**3 452**	2 932	325	27	169
Major changes to the organisation of work	***5 881***	**3 698**	43	3 634	22	**2 183**	1 893	141	25	124
External relations with other firms or public institutions	***3 676***	**2 343**	67	2 261	15	**1 333**	689	498	16	130
Marketing Innovations										
Design or packaging of a good or service	***4 108***	**2 314**	9	2 270	34	**1 794**	1 434	242	25	93
Sales or distribution methods	***3 721***	**1 083**	6	1 054	23	**2 638**	2 094	484	18	43
Enterprises without innovation activity										
Organisational Innovations										
Knowledge management systems to better use or exchange information	***710***	**331**	9	314	8	**379**	310	44	0	25
Major changes to the organisation of work	***1 167***	**573**	13	555	5	**594**	498	61	4	30
External relations with other firms or public institutions	***614***	**420**	18	400	2	**195**	141	23	0	31
Marketing Innovations										
Design or packaging of a good or service	***318***	**207**	0	207	0	**111**	25	77	0	9
Sales or distribution methods	***436***	**287**	0	286	1	**149**	122	17	0	10

Table A14.2 Percentage of innovative and non-innovative enterprises that introduced organisational or marketing innovations, 2005 - 2007

Proportion of enterprises with innovation activities (%)	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Organisational Innovations										
Knowledge management systems to better use or exchange information	***43.0***	**34.9**	61.8	34.5	37.4	**53.9**	54.4	43.9	91.8	68.0
Major changes to the organisation of work	***39.4***	**43.4**	36.3	43.5	39.8	**34.1**	35.2	19.0	87.6	49.8
External relations with other firms or public institutions	***24.6***	**27.5**	56.6	27.1	28.5	**20.8**	12.8	67.3	54.7	52.2
Marketing Innovations										
Design or packaging of a good or service	***27.5***	**27.1**	7.7	27.2	63.3	**28.0**	26.6	32.7	87.6	37.3
Sales or distribution methods	***24.9***	**12.7**	4.7	12.6	43.1	**41.2**	38.9	65.4	61.9	17.3
Proportion of enterprises without innovation activities										
Organisational Innovations										
Knowledge management systems to better use or exchange information	***9.0***	**8.6**	9.2	8.4	21.9	**9.4**	9.4	7.9	0.0	19.3
Major changes to the organisation of work	***14.7***	**14.8**	13.8	14.9	12.7	**14.7**	15.1	11.0	7.4	22.7
External relations with other firms or public institutions	***7.8***	**10.9**	18.4	10.7	4.7	**4.8**	4.3	4.1	0.0	23.4
Marketing Innovations										
Design or packaging of a good or service	***4.0***	**5.3**	0.0	5.5	0.0	**2.7**	0.8	13.8	0.0	6.5
Sales or distribution methods	***5.5***	**7.4**	0.0	7.6	4.0	**3.7**	3.7	3.1	0.0	7.5

Table A15.1 Number of enterprises that secured a patent in SA or applied for at least one patent outside SA, 2005 – 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Number of enterprises that secured a patent in SA										
All enterprises	***614***	**506**	11	487	9	**107**	94	3	0	10
Enterprises with innovation activity	***556***	**454**	11	437	6	**102**	89	3	0	10
Enterprises without innovation activity	***57***	**52**	0	49	3	**5**	5	0	0	0
Number of enterprises that applied for a patent outside SA										
All enterprises	***394***	**316**	2	305	9	**78**	68	5	1	5
Enterprises with innovation activity	***339***	**264**	2	256	6	**76**	65	5	1	5
Enterprises without innovation activity	***55***	**52**	0	49	3	**3**	3	0	0	0

Table A15.2 Percentage of enterprises that secured a patent in SA or applied for at least one patent outside SA, 2005 – 2007

Percentage of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Proportion of enterprises that secured a patent in SA (%)										
All enterprises	***2.7***	**4.1**	5.0	4.0	9.6	**1.0**	1.1	0.3	0.0	2.7
Enterprises with innovation activity	***3.7***	**5.3**	9.0	5.2	11.2	**1.6**	1.6	0.4	0.0	4.1
Enterprises without innovation activity	***0.7***	**1.3**	0.0	1.3	7.2	**0.1**	0.2	0.0	0.0	0.0
Proportion of enterprises that applied for a patent outside SA (%)										
All enterprises	***1.7***	**2.5**	0.8	2.5	9.6	**0.8**	0.8	0.4	1.3	1.3
Enterprises with innovation activity	***2.3***	**3.1**	1.5	3.1	11.2	**1.2**	1.2	0.7	4.1	1.9
Enterprises without innovation activity	***0.7***	**1.3**	0.0	1.3	7.2	**0.1**	0.1	0.0	0.0	0.0

Table A16.1 Number of enterprises that made use of intellectual property rights, 2005-2007

Type of intellectual property	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Enterprises with Innovation activity (number)										
Registered an industrial design	***642***	**598**	6	586	6	**44**	32	3	0	8
Registered a trademark	***1 682***	**1 395**	6	1 378	12	**286**	209	55	4	19
Claimed copyright	***756***	**587**	2	586	0	**169**	56	36	1	75
Granted a license on any intellectual property rights resulting from innovation	***520***	**443**	2	441	0	**77**	63	3	0	11
Enterprises without innovation activity (number)										
Registered an industrial design	***5***	**0**	0	0	0	**5**	5	0	0	0
Registered a trademark	***246***	**206**	0	206	0	**40**	36	4	0	0
Claimed copyright	***50***	**46**	0	46	0	**5**	5	0	0	0
Granted a license on any intellectual property rights resulting from innovation	***5***	**0**	0	0	0	**5**	5	0	0	0

Table A16.2 Percentage of enterprises that made use of intellectual property rights, 2005-2007

Type of intellectual property	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Enterprises with Innovation activity (%)										
Registered an industrial design	***4.3***	**7.0**	4.7	7.0	11.2	**0.7**	0.6	0.4	0.0	3.4
Registered a trademark	***11.3***	**16.4**	4.7	16.5	22.5	**4.5**	3.9	7.4	12.4	7.7
Claimed copyright	***5.1***	**6.9**	1.5	7.0	0.0	**2.6**	1.0	4.9	4.1	30.2
Granted a license on any intellectual property rights resulting from innovation	***3.5***	**5.2**	1.5	5.3	0.0	**1.2**	1.2	0.4	0.0	4.6
Enterprises without innovation activity (%)										
Registered an industrial design	***0.1***	**0.0**	0.0	0.0	0.0	**0.1**	0.2	0.0	0.0	0.0
Registered a trademark	***3.1***	**5.3**	0.0	5.5	0.0	**1.0**	1.1	0.6	0.0	0.0
Claimed copyright	***0.6***	**1.2**	0.0	1.2	0.0	**0.1**	0.1	0.0	0.0	0.0
Granted a license on any intellectual property rights resulting from innovation	***0.1***	**0.0**	0.0	0.0	0.0	**0.1**	0.2	0.0	0.0	0.0

Table A17.1 Geographic distribution of goods and services sold by innovative and non-innovative enterprises (number), 2005 – 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Geographic distribution – All enterprises										
South Africa (Only some provinces)	***11 177***	**6 019**	112	5 840	67	**5 158**	4 529	378	23	228
South Africa (National)	***10 897***	**6 405**	83	6 299	23	**4 491**	3 378	920	54	139
Rest of Africa	***5 085***	**3 413**	68	3 335	10	**1 672**	1 430	137	17	89
Europe	***3 494***	**2 842**	26	2 810	6	**652**	298	304	17	33
United States	***2 172***	**2 027**	20	1 999	8	**145**	75	54	12	4
Asia	***2 132***	**1 656**	20	1 629	8	**475**	191	262	13	10
Other Countries	***2 501***	**2 066**	6	2 052	8	**435**	329	78	13	16
Geographic distribution – Enterprises with innovation activity										
South Africa (Only some provinces)	***6 010***	**3 518**	69	3 415	34	**2 492**	2 189	154	0	149
South Africa (National)	***8 460***	**5 141**	33	5 087	20	**3 319**	2 530	661	29	100.0
Rest of Africa	***4 303***	**3 066**	62	2 998	6	**1 237**	1 119	30	17	72
Europe	***3 043***	**2 677**	26	2 645	6	**366**	83	241	17	25
United States	***1 978***	**1 872**	20	1 846	6	**106**	64	26	12	4
Asia	***1 918***	**1 628**	20	1 601	6	**291**	70	207	13	1
Other Countries	***2 039***	**1 854**	6	1 842	6	**185**	107	50	13	16
Geographic distribution – Enterprises without innovation activity										
South Africa (Only some provinces)	***5 168***	**2 501**	43	2 425	33	**2 667**	2 340	224	23	79
South Africa (National)	***2 436***	**1 265**	50	1 212	3	**1 171**	848	259	25	39
Rest of Africa	***781***	**346**	5	337	4	**435**	311	107	0	17
Europe	***452***	**165**	0	165	0	**287**	215	63	0	9
United States	***195***	**156**	0	154	2	**39**	11	28	0	0
Asia	***214***	**29**	0	27	2	**185**	121	55	0	9
Other Countries	***462***	**212**	0	210	2	**250**	222	28	0	0

Table A17.2 Geographic distribution of goods and services sold by innovative and non-innovative enterprises (%), 2005 – 2007

Proportion of enterprises (%)	*Total*	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Geographic distribution – All enterprises										
South Africa (Only some provinces)	***48.9***	**48.5**	52.2	48.3	74.1	**49.4**	52.1	29.2	25.6	60.1
South Africa (National)	***47.7***	**51.7**	38.8	52.1	25.9	**43.0**	38.9	70.9	60.7	36.7
Rest of Africa	***22.3***	**27.5**	31.6	27.6	11.4	**16.0**	16.5	10.6	18.7	23.4
Europe	***15.3***	**22.9**	12.0	23.2	6.7	**6.2**	3.4	23.5	18.8	8.8
United States	***9.5***	**16.3**	9.4	16.5	8.6	**1.4**	0.9	4.2	13.4	1.0
Asia	***9.3***	**13.4**	9.4	13.5	8.6	**4.5**	2.2	20.2	14.7	2.5
Other Countries	***10.9***	**16.7**	2.9	17.0	8.6	**4.2**	3.8	6.0	14.7	4.2
Geographic distribution – Enterprises with innovation activity										
South Africa (Only some provinces)	***40.2***	**41.2**	58.9	40.9	62.6	**38.9**	40.6	20.8	0.0	60.0
South Africa (National)	***56.6***	**60.3**	28.3	60.9	37.4	**51.8**	47.0	89.3	100.0	40.0
Rest of Africa	***28.8***	**35.9**	52.7	35.9	11.2	**19.3**	20.8	4.0	57.7	28.8
Europe	***20.4***	**31.4**	21.9	31.6	11.2	**5.7**	1.5	32.6	57.7	10.0
United States	***13.2***	**21.9**	17.1	22.1	11.2	**1.7**	1.2	3.6	41.2	1.5
Asia	***12.8***	**19.1**	17.1	19.2	11.2	**4.5**	1.3	27.9	45.3	0.4
Other Countries	***13.7***	**21.7**	5.3	22.0	11.2	**2.9**	2.0	6.7	45.3	6.4
Geographic distribution – Enterprises without innovation activity										
South Africa (Only some provinces)	***65.3***	**64.6**	44.6	64.9	90.8	**65.9**	70.9	40.3	38.2	60.5
South Africa (National)	***30.8***	**32.7**	51.9	32.4	8.3	**28.9**	25.7	46.5	41.5	29.9
Rest of Africa	***9.9***	**8.9**	5.2	9.0	11.0	**10.8**	9.4	19.2	0.0	13.0
Europe	***5.7***	**4.3**	0.0	4.4	0.0	**7.1**	6.5	11.3	0.0	6.9
United States	***2.5***	**4.0**	0.0	4.1	5.5	**1.0**	0.3	5.0	0.0	0.0
Asia	***2.7***	**0.7**	0.0	0.7	5.5	**4.6**	3.7	9.9	0.0	6.9
Other Countries	***5.8***	**5.5**	0.0	5.6	5.5	**6.2**	6.7	5.0	0.0	0.0

Table A18 Innovative enterprises that introduced organisational innovation that rated results as having a 'high' level of importance, 2005 - 2007

Number of innovative enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Improved market share	***2 183***	**760**	2	758	0	**1 423**	1 227	91	21	84
Reduced time to respond to customer or supplier needs	***4 568***	**2 541**	19	2 516	6	**2 027**	1 851	81	15	80
Improved quality of your goods or services	***6 025***	**3 932**	6	3 923	3	**2 093**	1 831	95	24	144
Reduced costs per unit output	***2 397***	**1 419**	4	1 406	9	**978**	880	56	4	39
Improved employee satisfaction/ turnover	***2 509***	**823**	7	813	3	**1 686**	1 548	63	7	68
Proportion of innovative enterprises (%)										
Improved market share	***14.6***	**8.9**	1.7	9.1	0.0	**22.2**	22.8	12.3	72.6	33.8
Reduced time to respond to customer or supplier needs	***30.6***	**29.8**	16.1	30.1	11.0	**31.6**	34.4	10.9	51.8	32.1
Improved quality of your goods or services	***40.3***	**46.1**	5.1	46.9	5.5	**32.7**	34.0	12.8	82.9	57.9
Reduced costs per unit output	***16.1***	**16.6**	3.4	16.8	16.6	**15.3**	16.3	7.5	13.8	15.7
Improved employee satisfaction/ turnover	***16.8***	**9.6**	5.9	9.7	5.5	**26.3**	28.7	8.5	24.2	27.3

Table A19 Innovative enterprises that received financial support for innovation activities from government sources , 2005 - 2007

Number of innovative enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Source of financial support										
Metros and municipalities	***6***	**0**	0	0	0	**6**	6	0	0	0
Provincial government	***0***	**0**	0	0	0	**0**	0	0	0	0
National government	***174***	**62**	0	62	0	**111**	98	10	1	2
National funding agencies	***240***	**215**	5	200	9	**25**	9	0	0	16
Foreign government/public sources	***186***	**167**	0	167	0	**19**	13	0	0	6

Proportion of innovative enterprises (%)										
Source of financial support										
Metros and municipalities	***0.0***	**0.0**	0.0	0.0	0.0	**0.1**	0.1	0.0	0.0	0.0
Provincial government	***0.0***	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0
National government	***1.2***	**0.7**	0.0	0.7	0.0	**1.7**	1.8	1.4	4.1	0.8
National funding agencies	***1.6***	**2.5**	4.3	2.4	17.3	**0.4**	0.2	0.0	0.0	6.4
Foreign government/public sources	***1.2***	**2.0**	0.0	2.0	0.0	**0.3**	0.2	0.0	0.0	2.3

Table A20 Number and percentage of staff with a degree or diploma, 2007 (year specific question)

	Total	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Total number of staff										
Enterprises with innovation activity	***3 249 997***	**1 574 340**	293 452	1 265 214	15 673	**1 675 657**	757 692	775 568	130 104	12 293
Enterprises without innovation activity	***270 611***	**160 429**	8 387	150 625	1 418	**110 182**	88 715	18 767	603	2 096
Number of staff with Degree or Diploma										
Enterprises with innovation activity	***266 523***	**115 003**	15 661	97 150	2 192	**151 520**	130 669	13 398	2 051	5 402
Enterprises without innovation activity	***17 306***	**11 281**	462	10 737	82	**6 025**	4 631	914	46	433
Proportion of staff with Degree or Diploma (%)										
Enterprises with innovation activity	***8.2***	**7.3**	5.3	7.7	14.0	**9.0**	17.2	1.7	1.6	43.9
Enterprises without innovation activity	***6.4***	**7.0**	5.5	7.1	5.8	**5.5**	5.2	4.9	7.7	20.7

Table A21 Enterprises with organisational and/or marketing innovations, 2005 - 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Enterprises with organisational innovation	***11 706***	**6 516**	125	6 355	36	**5 190**	4 214	703	32	240
Enterprises with marketing innovation	***6 188***	**2 872**	15	2 822	36	**3 315**	2 568	617	28	103
Innovative enterprises with organisational and/or marketing innovation	***10 691***	**6 138**	103	5 991	44	**4 554**	3 711	613	29	201
Product Only Innovative enterprises with organisational and/or marketing innovation	***1 940***	**944**	0	938	6	**996**	915	8	1	71
Process Only Innovative enterprises with organisational and/or marketing innovation	***1 977***	**1 040**	85	956	0	**936**	648	264	5	19
Product and Process Innovative enterprises with organisational and/or marketing innovation	***6 775***	**4 153**	18	4 098	38	**2 622**	2 148	340	23	111
Non-Innovative enterprises with organisational innovation only	***1 571***	**893**	22	861	9	**678**	540	93	4	39
Non-Innovative enterprises with marketing innovation	***689***	**441**	0	439	1	**249**	145	94	0	10
Non-Innovative enterprises with organisational	***1 627***	**843**	22	813	8	**785**	613	138	4	30
Non-Innovative enterprises with organisational	***316***	**245**	0	244	1	**71**	36	25	0	10
Percentage enterprises with organizational and/ or marketing innovations (%)										
Enterprises with organisational innovation	***51.2***	**52.6**	58.3	52.5	39.6	**49.7**	48.5	54.2	36.1	63.4
Enterprises with marketing innovation	***27.1***	**23.2**	6.9	23.3	39.5	**31.7**	29.6	47.6	31.1	27.1
Innovative enterprises with organisational and/or marketing innovation	***71.6***	**72.0**	87.2	71.7	80.6	**71.1**	68.9	82.9	100.0	80.8

Product Only Innovative enterprises with organisational and/or marketing innovation	***13.0***	**11.1**	0.0	11.2	11.2	**15.5**	17.0	1.1	4.1	28.5
Process Only Innovative enterprises with organisational and/or marketing innovation	***13.2***	**12.2**	72.1	11.4	0.0	**14.6**	12.0	35.8	17.6	7.7
Product and Process Innovative enterprises with organisational and/or marketing innovation	***45.4***	**48.7**	15.1	49.0	69.3	**40.9**	39.9	46.0	78.3	44.6
Non-Innovative enterprises with organisational innovation	***19.8***	**23.1**	23.0	23.1	26.0	**16.8**	16.4	16.8	7.4	30.2
Non-Innovative enterprises with marketing innovation	***8.7***	**11.4**	0.0	11.8	4.0	**6.1**	4.4	16.9	0.0	7.5
Non-Innovative enterprises with organisational	***20.6***	**21.8**	23.0	21.8	21.9	**19.4**	18.6	24.7	7.4	22.7
Non-Innovative enterprises with organisational	***4.0***	**6.3**	0.0	6.5	4.0	**1.8**	1.1	4.5	0.0	7.5

Table A22.1 Collaborative partnerships for innovation activities by type of partner , 2005 – 2007

Number of innovative enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Collaborative partnerships										
Other enterprises within your enterprise group	***1 717***	**1 203**	13	1 186	3	**514**	426	44	6	37
Suppliers of equipment, materials, components or software	***3 529***	**2 563**	24	2 530	9	**966**	803	74	27	63
Clients or customers	***3 650***	**2 682**	19	2 654	9	**968**	787	58	21	103
Competitors or other enterprises in your sector	***2 376***	**1 580**	19	1 552	9	**796**	691	50	9	46
Consultants, commercial labs or private R&D institutes	***2 292***	**1 793**	23	1 761	9	**498**	380	50	24	44
Universities or Technikons	***1 807***	**1 379**	19	1 350	9	**429**	355	32	7	34
Government or Public Research institutes	***2 403***	**1 376**	16	1 351	9	**1 026**	951	39	9	28
Percentage of innovative enterprises										
Collaborative partnerships										
Other enterprises within your enterprise group	***11.5***	**14.1**	11.4	14.2	6.1	**8.0**	7.9	6.0	20.6	15.0
Suppliers of equipment, materials, components or software	***23.6***	**30.0**	20.0	30.3	17.3	**15.1**	14.9	10.0	91.8	25.2
Clients or customers	***24.4***	**31.4**	15.7	31.7	17.3	**15.1**	14.6	7.9	71.1	41.3
Competitors or other enterprises in your sector	***15.9***	**18.5**	16.4	18.6	17.3	**12.4**	12.8	6.8	29.9	18.7
Consultants, commercial labs or private R&D institutes	***15.3***	**21.0**	19.2	21.1	17.3	**7.8**	7.1	6.8	83.5	17.5
Universities or Technikons	***12.1***	**16.2**	16.4	16.2	17.3	**6.7**	6.6	4.4	25.8	13.7
Government or Public Research institutes	***16.1***	**16.1**	13.6	16.2	17.3	**16.0**	17.7	5.2	29.9	11.2

Table A22.2 Collaborative partnerships for innovation activities by type of partner and their location (number), 2005 – 2007

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Location of partner										
Other enterprises within your enterprise group										
South Africa	***1 177***	**1 006**	12	990	3	**171**	92	38	4	37
Rest of Africa	***49***	**17**	5	12	0	**32**	13	14	2	3
Europe	***513***	**374**	2	372	0	**140**	123	9	5	3
USA	***330***	**234**	0	234	0	**95**	78	8	4	6
Asia	***98***	**29**	0	29	0	**69**	32	35	1	0
Other Countries	***482***	**202**	1	201	0	**280**	270	6	2	1
Suppliers of equipment, materials, components or software										
South Africa	***2 679***	**2 053**	19	2 025	9	**626**	502	56	25	43
Rest of Africa	***154***	**152**	0	152	0	**2**	0	2	0	0
Europe	***1 223***	**791**	9	782	0	**432**	381	15	14	22
USA	***325***	**214**	2	213	0	**111**	83	14	1	12
Asia	***417***	**306**	2	304	0	**111**	55	39	14	2
Other Countries	***160***	**123**	7	116	0	**37**	19	0	1	16
Clients or customers										
South Africa	***3 313***	**2 371**	18	2 344	9	**942**	761	58	21	103
Rest of Africa	***470***	**365**	3	356	6	**105**	47	35	13	10
Europe	***733***	**633**	0	633	0	**100.0**	45	36	14	4
USA	***569***	**498**	0	498	0	**70**	26	27	14	3
Asia	***107***	**40**	0	40	0	**66**	26	27	13	0
Other Countries	***305***	**272**	2	270	0	**33**	13	0	13	6

Table A 22.2 continues on p 120

Table A22.2 Collaborative partnerships for innovation activities by type of partner and their location (number), 2005 – 2007 (continued from p 119)

Number of enterprises	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Competitors or other enterprises in your sector										
South Africa	***2 054***	**1 278**	15	1 253	9	**776**	671	50	9	46
Rest of Africa	***198***	**173**	1	166	6	**25**	19	3	1	1
Europe	***231***	**186**	0	186	0	**46**	34	4	2	5
USA	***225***	**195**	0	195	0	**30**	19	3	2	5
Asia	***47***	**19**	0	19	0	**28**	18	3	1	5
Other Countries	***305***	**291**	4	287	0	**14**	13	0	1	0
Consultants, commercial labs or private R&D institutes										
South Africa	***1 878***	**1 666**	18	1 638	9	**212**	125	20	24	44
Rest of Africa	***34***	**27**	0	27	0	**7**	0	7	0	0
Europe	***445***	**359**	2	357	0	**86**	50	32	1	3
USA	***271***	**182**	0	182	0	**89**	51	34	1	3
Asia	***18***	**14**	0	14	0	**3**	0	3	0	0
Other Countries	***341***	**101**	11	90	0	**240**	237	0	1	1
Universities or Technikons										
South Africa	***1 677***	**1 275**	15	1 251	9	**402**	335	31	7	29
Rest of Africa	***5***	**2**	0	2	0	**3**	0	0	0	3
Europe	***403***	**352**	2	350	0	**51**	13	29	1	8
USA	***205***	**163**	0	163	0	**42**	32	0	1	8
Asia	***7***	**7**	0	7	0	**0**	0	0	0	0
Other Countries	***115***	**101**	4	94	3	**14**	13	0	0	1
Government or Public Research institutes										
South Africa	***1 966***	**960**	12	938	9	**1 006**	938	37	9	22
Rest of Africa	***6***	**6**	0	6	0	**0**	0	0	0	0
Europe	***312***	**12**	0	12	0	**301**	289	2	0	10
USA	***199***	**174**	0	174	0	**24**	19	0	0	5
Asia	***9***	**7**	0	7	0	**2**	0	0	0	2
Other Countries	***244***	**244**	4	240	0	**0**	0	0	0	0

Table A22.3 Collaborative partnerships for innovation activities by type of partner and their location (%), 2005 – 2007										
Percentage of enterprises (%)	***Total***	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Location of partner										
Other enterprises within your enterprise group										
South Africa	***7.9***	**11.8**	10.5	11.8	6.1	**2.7**	1.7	5.1	12.4	15.0
Rest of Africa	***0.3***	**0.2**	4.3	0.1	0.0	**0.5**	0.2	1.9	8.2	1.1
Europe	***3.4***	**4.4**	1.5	4.4	0.0	**2.2**	2.3	1.2	16.5	1.1
USA	***2.2***	**2.7**	0.0	2.8	0.0	**1.5**	1.4	1.1	12.4	2.4
Asia	***0.7***	**0.3**	0.0	0.3	0.0	**1.1**	0.6	4.8	4.1	0.0
Other Countries	***3.2***	**2.4**	0.8	2.4	0.0	**4.4**	5.0	0.9	8.2	0.4
Suppliers of equipment, materials, components or software										
South Africa	***17.9***	**24.1**	16.5	24.2	17.3	**9.8**	9.3	7.6	87.6	17.1
Rest of Africa	***1.0***	**1.8**	0.0	1.8	0.0	**0.0**	0.0	0.2	0.0	0.0
Europe	***8.2***	**9.3**	7.3	9.4	0.0	**6.7**	7.1	2.1	49.5	8.8
USA	***2.2***	**2.5**	1.5	2.5	0.0	**1.7**	1.5	2.0	4.1	4.8
Asia	***2.8***	**3.6**	1.5	3.6	0.0	**1.7**	1.0	5.3	49.5	0.9
Other Countries	***1.1***	**1.4**	5.9	1.4	0.0	**0.6**	0.4	0.0	4.1	6.6
Clients or customers										
South Africa	***22.2***	**27.8**	14.9	28.0	17.3	**14.7**	14.1	7.9	71.1	41.3
Rest of Africa	***3.1***	**4.3**	2.3	4.3	11.2	**1.6**	0.9	4.8	45.3	3.9
Europe	***4.9***	**7.4**	0.0	7.6	0.0	**1.6**	0.8	4.9	49.5	1.5
USA	***3.8***	**5.8**	0.0	6.0	0.0	**1.1**	0.5	3.7	49.5	1.1
Asia	***0.7***	**0.5**	0.0	0.5	0.0	**0.0**	1.0	3.7	45.3	0.0
Other Countries	***2.0***	**3.2**	1.5	3.2	0.0	**0.5**	0.2	0.0	45.3	2.6

Table A 22.3 continues on p 122

Table A22.3 Collaborative partnerships for innovation activities by type of partner and their location (%), 2005 – 2007 (continued from p 121)

Percentage of enterprises (%)	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Competitors or other enterprises in your sector										
South Africa	***13.8***	**15.0**	12.9	15.0	17.3	**12.1**	12.5	6.8	29.9	18.7
Rest of Africa	***1.3***	**2.0**	0.8	2.0	11.2	**0.4**	0.4	0.4	4.1	0.4
Europe	***1.5***	**2.2**	0.0	2.2	0.0	**0.7**	0.6	0.6	8.2	2.0
USA	***1.5***	**2.3**	0.0	2.3	0.0	**0.5**	0.4	0.4	8.2	2.0
Asia	***0.3***	**0.2**	0.0	0.2	0.0	**0.4**	0.3	0.4	4.1	2.0
Other Countries	***2.0***	**3.4**	3.5	3.4	0.0	**0.2**	0.2	0.0	4.1	0.0
Consultants, commercial labs or private R&D institutes										
South Africa	***12.6***	**19.5**	15.7	19.6	17.3	**3.3**	2.3	2.7	83.5	17.5
Rest of Africa	***0.2***	**0.3**	0.0	0.3	0.0	**0.1**	0.0	1.0	0.0	0.0
Europe	***3.0***	**4.2**	1.5	4.3	0.0	**1.3**	0.9	4.4	4.1	1.1
USA	***1.8***	**2.1**	0.0	2.2	0.0	**1.4**	0.9	4.6	4.1	1.1
Asia	***0.1***	**0.2**	0.0	0.2	0.0	**0.1**	0.0	0.4	0.0	0.0
Other Countries	***2.3***	**1.2**	9.3	1.1	0.0	**3.7**	4.4	0.0	4.1	0.4
Universities or Technikons										
South Africa	***11.2***	**14.9**	12.9	15.0	17.3	**6.3**	6.2	4.2	25.8	11.6
Rest of Africa	***0.0***	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	1.1
Europe	***2.7***	**4.1**	1.5	4.2	0.0	**0.8**	0.2	3.9	4.1	3.3
USA	***1.4***	**1.9**	0.0	1.9	0.0	**0.7**	0.6	0.0	4.1	3.3
Asia	***0.0***	**0.1**	0.0	0.1	0.0	**0.0**	0.0	0.0	0.0	0.0
Other Countries	***0.8***	**1.2**	3.5	1.1	6.1	**0.2**	0.2	0.0	0.0	0.4
Government or Public Research institutes										
South Africa	***13.2***	**11.3**	10.1	11.2	17.3	**15.7**	17.4	5.0	29.9	9.0
Rest of Africa	***0.0***	**0.1**	0.0	0.1	0.0	**0.0**	0.0	0.0	0.0	0.0
Europe	***2.1***	**0.1**	0.0	0.1	0.0	**4.7**	5.4	0.2	0.0	4.2
USA	***1.3***	**2.0**	0.0	2.1	0.0	**0.4**	0.4	0.0	0.0	2.0
Asia	***0.1***	**0.1**	0.0	0.1	0.0	**0.0**	0.0	0.0	0.0	0.9
Other Countries	***1.6***	**2.9**	3.5	2.9	0.0	**0.0**	0.0	0.0	0.0	0.0

Table A23 Innovative enterprises performing process innovations, 2005 - 2007										
Process innovators	***Total***	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Number of process innovators	***11 352***	**6 415**	118	6 249	48	**4 937**	4 022	731	28	156
% Process innovators	***49.7***	**51.7**	55.0	51.7	53.2	**47.2**	46.3	56.4	31.1	41.0

Table A24 Innovative enterprises performing specific process innovations, 2005 - 2007										
Number of process innovators	***Total***	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Methods of manufacturing or production	***7 032***	**5 167**	48	5 071	48	**1 865**	1 684	71	27	84
Delivery or distribution methods	***3 544***	**1 692**	42	1 634	15	**1 853**	1 239	531	21	62
Supporting Activities	***7 871***	**4 082**	99	3 974	8	**3 790**	3 089	522	27	152
Percentage process innovators (%)										
Methods of manufacturing or production	***30.8***	**41.7**	22.4	41.9	53.2	**17.8**	19.4	5.5	29.8	22.1
Delivery or distribution methods	***15.5***	**13.6**	19.7	13.5	17.1	**17.7**	14.3	40.9	24.1	16.3
Supporting Activities	***34.5***	**32.9**	46.3	32.9	9.0	**36.3**	35.6	40.2	29.8	40.0

Table A25 Responsibility for process innovations, 2005-2007

Number of process innovators	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
All process innovators	***11 352***	**6 415**	118	6 249	48	**4 937**	4 022	731	28	156
Mainly yours	***6 642***	**4 278**	49	4 195	34	**2 364**	1 990	261	21	93
Yours together with others	***2 567***	**1 376**	69	1 293	14	**1 191**	979	174	7	31
Mainly others	***2 136***	**761**	0	761	0	**1 375**	1 046	297	0	32
Enterprises which did not respond to the question	***6***	**0**	0	0	0	**6**	6	0	0	0
Percentage process innovators										
All process innovators	***100.0***	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Mainly yours	***58.5***	**66.7**	41.7	67.1	70.5	**47.9**	49.5	35.7	74.2	59.5
Yours together with others	***22.6***	**21.5**	58.3	20.7	29.5	**24.1**	24.3	23.8	25.8	19.7
Mainly others	***18.8***	**11.9**	0.0	12.2	0.0	**27.9**	26.0	40.6	0.0	20.8
Enterprises which did not respond to the question	***0.1***	**0.0**	0.0	0.0	0.0	**0.1**	0.2	0.0	0.0	0.0

Table A26 Origin of process innovations, 2005-2007

Number of process innovators	*Total*	Industry	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Services	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Origin of process innovation										
All process innovators	***14 928***	**8 530**	118	8 358	54	**6 398**	5 380	740	29	249
South Africa	***9 108***	**5 308**	117	5 143	48	**3 801**	2 976	680	25	119
Abroad	***2 237***	**1 107**	1	1 106	0	**1 130**	1 039	51	2	37
Enterprises which did not respond to the question	***3 582***	**2 115**	0	2 109	6	**1 468**	1 365	8	1	93
Percentage of process innovators (%)										
Origin of process innovation										

All process innovators	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
South Africa	61.0	62.2	99.2	61.5	88.8	59.4	55.3	91.9	87.6	47.8
Abroad	15.0	13.0	0.8	13.2	0.0	17.7	19.3	6.9	8.2	14.7
Enterprises which did not respond to the question	24.0	24.8	0.0	25.2	11.2	22.9	25.4	1.1	4.1	37.4

Table A27 Enterprises which introduced new or improved products to the market or firm as a percentage of enterprises

Number of enterprises	***Total***	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
New to the market	7 199	4 556	9	4 509	38	2 644	2 395	73	23	153
New to the firm	8 546	5 630	18	5 585	28	2 916	2 462	292	20	141
Percentage enterprises (%)										
New to the market	48.2	53.4	7.4	54.0	69.3	41.3	44.5	9.8	78.3	61.5
New to the firm	57.2	66.0	15.1	66.8	50.8	45.5	45.7	39.5	70.1	56.7

Table A28 Number and percentage of enterprises that stated they were part of a larger group, 2005 - 2007

Number of enterprises	***Total***	**Industry**	Mining and quarrying	Manufacturing	Electricity, gas and water supply	**Services**	Wholesale and Retail trade	Transport, Storage and communication	Financial intermediation	Computer and related, R&D, Architectural & Engineering, Technical Testing
Enterprise group status										
Part of a larger group	***4 487***	**3 191**	98	3 084	9	**1 297**	1 081	131	21	64
Not part of a larger group	***18 361***	**9 208**	116	9 010	82	**9 153**	7 604	1 166	68	316
Percentage of enterprises (%)										
Enterprise group status										
Part of a larger group	***19.6***	**25.7**	45.8	25.5	9.8	**12.4**	12.4	10.1	24.0	16.7
Not part of a larger group	***80.4***	**74.3**	54.2	74.5	90.2	**87.6**	87.6	89.9	76.0	83.3

Table B1.1 Number and percentage of enterprises, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of enterprises																
Type of product innovation																
All enterprises	***1 675***	***4 541***	***7 813***	***8 820***	604	3 293	3 503	4 998	582	3 174	3 424	4 914	1 071	1 248	4 309	3 822
Enterprises with innovation activity	***1 256***	***3 301***	***5 112***	***5 265***	482	2 468	2 292	3 289	462	2 396	2 239	3 261	774	834	2 820	1 976
Product only innovators	***77***	***384***	***585***	***985***	16	285	263	382	16	285	263	382	62	99	322	603
Process only innovators	***168***	***259***	***830***	***1 105***	47	258	189	67	44	201	189	67	121	1	641	1 038
Product and process innovators	***180***	***448***	***442***	***745***	60	326	144	556	60	326	144	556	121	121	298	190
Enterprises with on-going and/or abandoned innovations	***830***	***2 210***	***3 255***	***2 430***	359	1 598	1 696	2 284	342	1 584	1 643	2 256	472	612	1 559	146
Enterprises without innovation activity	***419***	***1 240***	***2 701***	***3 555***	122	825	1 212	1 710	121	778	1 185	1 653	297	414	1 489	1 846
Proportion of all enterprises (%)																
Type of product innovation																
All enterprises	***100.0***	***100.0***	***100.0***	***100.0***	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Enterprises with innovation activity	***75.0***	***72.7***	***65.4***	***59.7***	79.8	74.9	65.4	65.8	79.3	75.5	65.4	66.4	72.3	66.8	65.4	51.7
Product only innovators	***4.6***	***8.5***	***7.5***	***11.2***	2.6	8.7	7.5	7.6	2.7	9.0	7.7	7.8	5.7	7.9	7.5	15.8
Process only innovators	***10.0***	***5.7***	***10.6***	***12.5***	7.8	7.8	5.4	1.3	7.6	6.3	5.5	1.4	11.3	0.1	14.9	27.2
Product and process innovators	***10.8***	***9.9***	***5.7***	***8.5***	9.9	9.9	4.1	11.1	10.3	10.3	4.2	11.3	11.3	9.7	6.9	5.0
Enterprises with on-going and/or abandoned innovations	***49.6***	***48.7***	***41.7***	***27.5***	59.4	48.5	48.4	45.7	58.7	49.9	48.0	45.9	44.0	49.1	36.2	3.8
Enterprises without innovation activity	***25.0***	***27.3***	***34.6***	***40.3***	20.2	25.1	34.6	34.2	20.7	24.5	34.6	33.6	27.7	33.2	34.6	48.3

*** Manufacturing is included in Industry, but shown here for information purposes.**

Table B1.2 Summary of number and percentage of enterprises, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of enterprises																
All enterprises	***1 675***	***4 541***	***7 813***	***8 820***	604	3 293	3 503	4 998	582	3 174	3 424	4 914	1 071	1 248	4 309	3 822
Enterprises with innovation activity	***1 256***	***3 301***	***5 112***	***5 265***	482	2 468	2 292	3 289	462	2 396	2 239	3 261	774	834	2 820	1 976
Enterprises without innovation activity	***419***	***1 240***	***2 701***	***3 555***	122	825	1 212	1 710	121	778	1 185	1 653	297	414	1 489	1 846
Proportion of enterprises (%)																
All enterprises	***100.0***	***100.0***	***100.0***	***100.0***	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Enterprises with innovation activity	***75.0***	***72.7***	***65.4***	***59.7***	79.8	74.9	65.4	65.8	79.3	75.5	65.4	66.4	72.3	66.8	65.4	51.7
Enterprises without innovation activity	***25.0***	***27.3***	***34.6***	***40.3***	20.2	25.1	34.6	34.2	20.7	24.5	34.6	33.6	27.7	33.2	34.6	48.3

Table B1.3 Innovation activities according to size class, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Type of innovation (number)																
Goods Innovation	***834***	***2 356***	***3 165***	**2 348**	394	1 808	1 604	2 141	386	1 801	1 582	2 113	440	548	1 561	207
Services Innovation	***663***	***1 835***	***2 324***	**2 973**	206	1 240	745	2 152	199	1 231	735	2 152	457	595	1 579	820
Product Innovation	***1 016***	***2 698***	***4 136***	**3 763**	413	1 866	1 984	2 942	400	1 857	1 962	2 914	603	833	2 152	820
Process Innovation	***1 113***	***2 878***	***3 741***	**3 620**	451	2 152	1 565	2 247	431	2 081	1 518	2 219	662	726	2 176	1 373
Type of innovation (%)																
Goods Innovation	***66.4***	***71.4***	***61.9***	***44.6***	81.8	73.3	70.0	65.1	83.5	75.2	70.7	64.8	56.9	65.8	55.3	10.5
Services Innovation	***52.8***	***55.6***	***45.5***	***56.5***	42.9	50.2	32.5	65.4	43.0	51.4	32.8	66.0	59.0	71.4	56.0	41.5
Product Innovation	***80.9***	***81.7***	***80.9***	***71.5***	85.7	75.6	86.6	89.5	86.5	77.5	87.6	89.4	77.8	99.9	76.3	41.5
Process Innovation	***88.6***	***87.2***	***73.2***	***68.8***	93.7	87.2	68.3	68.3	93.4	86.8	67.8	68.0	85.5	87.1	77.1	69.5

Table B2 Number and percentage of employees, 2007 (year specific question)

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of employees																
All enterprises	***2 479 748***	***733 179***	***196 595***	***111 086***	861 052	667 162	126 581	79 973	580 465	647 469	112 188	75 717	1 618 696	66 016	70 013	31 113
Enterprises with innovation activity	***2 363 586***	***683 066***	***137 259***	***66 087***	809 037	622 605	91 575	51 124	528 962	607 040	78 288	50 925	1 554 549	60 461	45 684	14 963
Enterprises without innovation activity	***116 163***	***50 112***	***59 336***	***45 000***	52 016	44 557	35 007	28 849	51 503	40 429	33 900	24 792	64 147	5 555	24 329	16 151
Proportion of all employees (%)																
All enterprises	***100.0***	***100.0***	***100.0***	***100.0***	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Enterprises with innovation activity	***95.3***	***93.2***	***69.8***	***59.5***	94.0	93.3	72.3	63.9	91.1	93.8	69.8	67.3	96.0	91.6	65.3	48.1
Enterprises without innovation activity	***4.7***	***6.8***	***30.2***	***40.5***	6.0	6.7	27.7	36.1	8.9	6.2	30.2	32.7	4.0	8.4	34.7	51.9

Table B3 Turnover 2007 (year specific question)

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Turnover (R millions)																
All enterprises	***2 969 070***	***224 591***	***88 616***	***28 923***	1 296 274	162 724	35 120	14 208	1 105 928	153 618	26 370	13 688	1 672 796	61 867	53 496	14 715
Enterprises with innovation activity	***2 566 872***	***184 744***	***57 464***	***16 002***	1 088 687	137 304	25 475	8 499	899 158	129 200	16 839	8 425	1 478 185	47 440	31 989	7 502
Enterprises without innovation activity	***402 199***	***39 847***	***31 152***	***12 922***	207 587	25 420	9 645	5 709	206 769	24 418	9 531	5 263	194 612	14 427	21 507	7 213
Percentage of total turnover (%)																
All enterprises	***100.0***	***100.0***	***100.0***	***100.0***	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Enterprises with innovation activity	***86.5***	***82.3***	***64.8***	***55.3***	84.0	84.4	72.5	59.8	81.3	84.1	63.9	61.6	88.4	76.7	59.8	51.0
Enterprises without innovation activity	***13.5***	***17.7***	***35.2***	***44.7***	16.0	15.6	27.5	40.2	18.7	15.9	36.1	38.4	11.6	23.3	40.2	49.0

Table B4.1 Enterprises with innovation activities: expenditure on innovation, 2007 (year specific question)

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Type of expenditure (R millions)																
Intramural (in-house) R&D in 2007	***10 608***	***908***	***371***	***211***	5 447	785	306	181	5 156	780	260	181	5 160	123	65	30
Extramural or outsourced R&D	***6 001***	***381***	***81***	***17***	2 051	115	57	17	1 954	113	51	17	3 950	266	23	0
Acquisition of machinery, equipment and software	***26 622***	***5 642***	***1 155***	***502***	13 190	2 917	1 058	355	9 838	2 734	892	355	13 432	2 725	96	146
Acquisition of other external knowledge	***3 824***	***587***	***21***	***30***	355	138	15	30	330	137	15	30	3 469	448	6	0
Type of expenditure (%)																
Intramural (in-house) R&D in 2007	***87.7***	***7.5***	***3.1***	***1.7***	81.1	11.7	4.6	2.7	80.9	12.2	4.1	2.8	95.9	2.3	1.2	0.6
Extramural or outsourced R&D	***92.6***	***5.9***	***1.2***	***0.3***	91.6	5.1	2.6	0.8	91.5	5.3	2.4	0.8	93.2	6.3	0.6	0.0
Acquisition of machinery, equipment and software	***78.5***	***16.6***	***3.4***	***1.5***	75.3	16.6	6.0	2.0	71.2	19.8	6.5	2.6	81.9	16.6	0.6	0.9
Acquisition of other external knowledge	***85.7***	***13.1***	***0.5***	***0.7***	66.0	25.7	2.8	5.5	64.5	26.8	2.8	5.8	88.4	11.4	0.1	0.0

Table B4.2 Number and percentage of innovative enterprises having engaged in specific innovation expenditure, 2007 (year specific question)

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Type of expenditure (number of innovative enterprises)																
Intramural (in-house) R&D in 2007	***750***	***2 424***	***2 333***	***1 229***	328	1 728	1 335	1 197	311	1 714	1 317	1 180	422	696	997	31
Extramural or outsourced R&D	***558***	***1 115***	***698***	***308***	225	1 004	372	303	205	1 000	366	303	333	112	326	5
Acquisition of machinery, equipment and software	***952***	***2 872***	***3 840***	***2 142***	388	2 074	1 901	1 739	368	2 011	1 855	1 721	565	798	1 938	403
Acquisition of other external knowledge	***457***	***681***	***429***	***1 032***	177	569	355	1 012	163	560	333	1 012	280	111	74	20
Type of expenditure (% of innovative enterprises)																
Intramural (in-house) R&D in 2007	***60.3***	***73.4***	***45.6***	***23.3***	68.0	70.0	58.3	36.4	67.3	71.6	58.8	36.2	55.4	83.5	35.4	1.6
Extramural or outsourced R&D	***44.9***	***33.8***	***13.7***	***5.9***	46.7	40.7	16.2	9.2	44.4	41.7	16.3	9.3	43.8	13.4	11.6	0.2
Acquisition of machinery, equipment and software	***76.6***	***87.0***	***75.1***	***40.7***	80.5	84.0	83.0	52.9	79.6	83.9	82.8	52.8	74.2	95.7	68.7	20.4
Acquisition of other external knowledge	***36.7***	***20.6***	***8.4***	***19.6***	36.8	23.1	15.5	30.8	35.3	23.4	14.9	31.0	36.7	13.3	2.6	1.0

Table B5.1 Product (goods and services) innovators: number breakdown of turnover by product type, 2007 (year specific question)

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Turnover breakdown (R millions)																
All Product innovators	***2 252 140***	***159 114***	***48 951***	***10 832***	**908 519**	**111 696**	**23 022**	**7 015**	**844 912**	**111 211**	**14 513**	**6 941**	**1 343 621**	**47 418**	**25 929**	**3 816**
Innovations new to the market	***177 404***	***23 264***	***7 684***	***1 153***	71 752	19 760	2 999	322	70 142	19 633	1 575	318	105 652	3 504	4 684	831
Innovations new to the firm	***128 806***	***25 631***	***5 001***	***1 027***	33 156	9 683	2 922	737	30 370	9 599	956	732	95 650	15 949	2 080	290
Unchanged or marginally modified	***1 945 930***	***110 219***	***36 266***	***8 651***	803 610	82 253	17 101	5 956	744 399	81 979	11 982	5 890	1 142 320	27 965	19 165	2 695
Product only innovators	***36 480***	***12 748***	***6 907***	***3 380***	**20 211**	**10 251**	**1 111**	**779**	**20 211**	**10 251**	**1 111**	**779**	**16 270**	**2 497**	**5 796**	**2 601**
Innovations new to the market	***9 792***	***1 049***	***217***	***16***	8 774	1 049	142	16	8 774	1 049	142	16	1 018	0	75	0

Innovations new to the firm	***5 772***	***2 395***	***264***	***179***	3 677	484	79	23	3 677	484	79	23	2 095	1 911	185	156
Unchanged or marginally modified	***20 916***	***9 304***	***6 426***	***3 185***	7 759	8 719	890	740	7 759	8 719	890	740	13 157	586	5 536	2 445
Product and Process innovators	***238 498***	***16 386***	***6 968***	***2 041***	**47 808**	**10 506**	**1 242**	**1 102**	**47 808**	**10 506**	**1 242**	**1 102**	**190 690**	**5 880**	**5 727**	**939**
Innovations new to the market	***9 950***	***4 138***	***915***	***759***	3 185	4 088	62	34	3 185	4 088	62	34	6 764	50	853	725
Innovations new to the firm	***11 272***	***5 509***	***966***	***110***	2 146	2 844	124	98	2 146	2 844	124	98	9 127	2 664	842	12
Unchanged or marginally modified	***217 276***	***6 739***	***5 087***	***1 171***	42 477	3 573	1 055	970	42 477	3 573	1 055	970	174 798	3 166	4 031	202

Table B5.2 Product (goods and services) innovators: percentage breakdown of turnover by product type, 2007 (year specific question)

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Turnover breakdown (% of total turnover)																
All Product innovators	***100.0***	***100.0***	***100.0***	***100.0***	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Innovations new to the market	***7.9***	***14.6***	***15.7***	***10.6***	7.9	17.7	13.0	4.6	8.3	17.7	10.9	4.6	7.9	7.4	18.1	21.8
Innovations new to the firm	***5.7***	***16.1***	***10.2***	***9.5***	3.6	8.7	12.7	10.5	3.6	8.6	6.6	10.5	7.1	33.6	8.0	7.6
Unchanged or marginally modified	***86.4***	***69.3***	***74.1***	***79.9***	88.5	73.6	74.3	84.9	88.1	73.7	82.6	84.9	85.0	59.0	73.9	70.6
Product only innovators	***100.0***	***100.0***	***100.0***	***100.0***	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Innovations new to the market	***26.8***	***8.2***	***3.1***	***0.5***	43.4	10.2	12.8	2.0	43.4	10.2	12.8	2.0	6.3	0.0	1.3	0.0
Innovations new to the firm	***15.8***	***18.8***	***3.8***	***5.3***	18.2	4.7	7.1	3.0	18.2	4.7	7.1	3.0	12.9	76.5	3.2	6.0
Unchanged or marginally modified	***57.3***	***73.0***	***93.0***	***94.2***	38.4	85.1	80.1	95.0	38.4	85.1	80.1	95.0	80.9	23.5	95.5	94.0
Product and Process innovators	***100.0***	***100.0***	***100.0***	***100.0***	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Innovations new to the market	***4.2***	***25.3***	***13.1***	***37.2***	6.7	38.9	5.0	3.1	6.7	38.9	5.0	3.1	3.5	0.8	14.9	77.3
Innovations new to the firm	***4.7***	***33.6***	***13.9***	***5.4***	4.5	27.1	10.0	8.9	4.5	27.1	10.0	8.9	4.8	45.3	14.7	1.2
Unchanged or marginally modified	***91.1***	***41.1***	***73.0***	***57.4***	88.8	34.0	85.0	88.0	88.8	34.0	85.0	88.0	91.7	53.8	70.4	21.5

Table B6 Innovative enterprises: responsibility for the development of product innovations, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Responsibility for development of product innovation																
Number of innovative enterprises																
All Innovative enterprises	***1 016***	***2 698***	***4 136***	***3 763***	413	1 866	1 984	2 942	400	1 857	1 962	2 914	603	833	2 152	820
Mainly own enterprise	***570***	***1 170***	***2 872***	***2 796***	284	1 011	1 409	2 167	277	1 006	1 397	2 139	286	159	1 463	629
Own enterprise in collaboration with other enterprises or institutions	***315***	***1 123***	***269***	***155***	94	564	233	150	89	561	223	150	221	558	36	5
Other enterprises or institution	***130***	***405***	***995***	***812***	35	290	341	626	33	290	341	626	96	115	653	186
Proportion of innovative enterprises (%)																
Responsibility for development of product innovation																
All innovative enterprises	***100.0***	***100.0***	***100.0***	***100.0***	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mainly own enterprise	***56.1***	***43.4***	***69.4***	***74.3***	68.8	54.2	71.0	73.6	69.4	54.2	71.2	73.4	47.5	19.1	68.0	76.7
Own enterprise in collaboration with other enterprises or institutions	***31.0***	***41.6***	***6.5***	***4.1***	22.9	30.2	11.8	5.1	22.4	30.2	11.4	5.1	36.6	67.1	1.7	0.7
Other enterprises or institution	***12.8***	***15.0***	***24.1***	***21.6***	8.4	15.6	17.2	21.3	8.2	15.6	17.4	21.5	15.9	13.8	30.4	22.7

Table B7 Origin of product innovation, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of innovative enterprises																
Origin of innovation																
All innovative enterprises	***1 016***	***2 698***	***4 136***	***3 763***	413	1 866	1 984	2 942	400	1 857	1 962	2 914	603	833	2 152	820
South Africa	***572***	***1 866***	***3 611***	***2 774***	276	1 373	1 812	2 140	262	1 369	1 796	2 112	297	493	1 799	634
Abroad	***437***	***832***	***525***	***988***	137	493	172	802	137	488	166	802	299	339	353	186
Enterprises which did not respond to the question	***6***	***0***	***0***	***0***	0	0	0	0	0	0	0	0	6	0	0	0
Percentage of innovative enterprises (%)																
Origin of innovation																
All innovative enterprises	***100.0***	***100.0***	***100.0***	***100.0***	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
South Africa	***56.4***	***69.2***	***87.3***	***73.7***	66.7	73.6	91.3	72.7	65.6	73.7	91.5	72.5	49.3	59.2	83.6	77.3
Abroad	***43.0***	***30.8***	***12.7***	***26.3***	33.3	26.4	8.7	27.3	34.4	26.3	8.5	27.5	49.7	40.8	16.4	22.7
Enterprises which did not respond to the question	***0.6***	***0.0***	***0.0***	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0

Table B8.1 'Highly important' effects of innovation on outcomes for enterprises (number), 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Product Outcomes																
Increased range of goods and services	***517***	***1 270***	***1 681***	***1 195***	214	779	1 273	733	206	773	1 263	716	304	491	408	461
Entered new markets or increased market share	***426***	***520***	***1 192***	***402***	151	495	1 124	381	145	492	1 118	363	275	26	67	21
Improved quality of goods or services	***496***	***1 524***	***1 094***	***1 466***	206	856	387	1 022	196	853	377	994	290	668	707	444
Process outcomes																
Improved flexibility of production or service provision	***336***	***488***	***980***	***552***	151	449	588	531	149	448	578	520	185	39	391	21
Increased capacity of production or service provision	***441***	***729***	***1 649***	***1 010***	227	699	1 254	803	224	697	1 229	792	215	30	395	207
Reduced labour costs per unit output	***145***	***527***	***135***	***518***	76	295	116	513	74	295	110	502	68	232	19	5
Reduced materials and energy per unit output	***147***	***510***	***458***	***606***	72	286	116	601	67	286	110	591	74	224	342	5
Other Outcomes																
Reduced environmental impacts or improved health and safety	***252***	***500***	***113***	***73***	117	273	83	67	103	272	79	67	135	227	30	5
Met governmental regulatory requirements	***350***	***635***	***839***	***523***	138	621	154	502	128	616	154	502	212	15	686	21

Table B8.2 'Highly important' effects of innovation on outcomes for enterprises (%), 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Product Outcomes																
Increased range of goods and services	***41.6***	***38.5***	***32.9***	***22.7***	44.3	31.6	55.5	22.3	44.7	32.3	56.4	22.0	39.9	58.9	14.5	23.4
Entered new markets or increased market share	***34.2***	***15.8***	***23.3***	***7.6***	31.3	20.0	49.1	11.6	31.4	20.5	49.9	11.1	36.1	3.1	2.4	1.1
Improved quality of goods or services	***39.9***	***46.2***	***21.4***	***27.8***	42.8	34.7	16.9	31.1	42.4	35.6	16.8	30.5	38.0	80.2	25.1	22.5
Process Outcomes																
Improved flexibility of production or service provision	***27.0***	***14.8***	***19.2***	***10.5***	31.4	18.2	25.7	16.1	32.3	18.7	25.8	16.0	24.3	4.7	13.9	1.1
Increased capacity of production or service provision	***35.5***	***22.1***	***32.3***	***19.2***	47.0	28.3	54.7	24.4	48.5	29.1	54.9	24.3	28.2	3.6	14.0	10.5
Reduced labour costs per unit output	***11.6***	***16.0***	***2.6***	***9.8***	15.8	11.9	5.1	15.6	16.1	12.3	4.9	15.4	9.0	27.9	0.7	0.3
Reduced materials and energy per unit output	***11.8***	***15.5***	***9.0***	***11.5***	15.0	11.6	5.1	18.3	14.6	11.9	4.9	18.1	9.8	26.9	12.1	0.3
Other Outcomes																
Reduced environmental impacts or improved health and safety	***20.2***	***15.1***	***2.2***	***1.4***	24.2	11.1	3.6	2.0	22.2	11.3	3.5	2.1	17.7	27.2	1.1	0.3
Met governmental regulatory requirements	***28.1***	***19.2***	***16.4***	***9.9***	28.7	25.2	6.7	15.3	27.6	25.7	6.9	15.4	27.8	1.7	24.3	1.1

Table B9.1 Enterprises with innovation activity: number of enterprises that introduced new goods or services, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of enterprises																
All Product innovators																
Introduced new goods	***834***	***2 356***	***3 165***	***2 348***	394	1 808	1 604	2 141	386	1 801	1 582	2 113	440	548	1 561	207
Introduced new services	***663***	***1 835***	***2 324***	***2 973***	206	1 240	745	2 152	199	1 231	735	2 152	457	595	1 579	820
Product only innovators																
Introduced new goods	***113***	***377***	***957***	***381***	30	282	347	381	30	282	341	381	83	95	610	0
Introduced new services	***72***	***150***	***755***	***1 557***	10	42	401	954	10	42	401	954	62	108	354	603
Product and process innovators																
Introduced new goods	***721***	***1 979***	***2 208***	***1 967***	364	1 526	1 257	1 760	355	1 519	1 241	1 732	357	453	950	207
Introduced new services	***592***	***1 685***	***1 569***	***1 416***	197	1 198	344	1 198	189	1 189	333	1 198	395	487	1 225	217

Table B9.2 Enterprises with innovation activity: percentage of enterprises that introduced new goods or services, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Proportion of enterprises (%)																
All Product innovators																
Introduced new goods	***9.6***	***27.1***	***36.4***	***27.0***	6.6	30.4	27.0	36.0	6.6	30.6	26.9	35.9	16.0	19.9	56.6	7.5
Introduced new services	***8.5***	***23.5***	***29.8***	***38.1***	4.8	28.5	17.2	49.6	4.6	28.5	17.0	49.9	13.2	17.2	45.8	23.8
Product only innovators																
Introduced new goods	***6.2***	***20.6***	***52.4***	***20.8***	2.9	27.1	33.4	36.6	2.9	27.3	33.0	36.8	10.5	12.1	77.4	0.0
Introduced new services	***2.8***	***5.9***	***29.8***	***61.5***	0.7	3.0	28.5	67.8	0.7	3.0	28.5	67.8	5.5	9.6	31.4	53.6
Product and process innovators																
Introduced new goods	***10.5***	***28.8***	***32.1***	***28.6***	7.4	31.1	25.6	35.9	7.3	31.3	25.6	35.7	18.1	23.0	48.3	10.5
Introduced new services	***11.2***	***32.0***	***29.8***	***26.9***	6.7	40.8	11.7	40.8	6.5	40.9	11.5	41.2	17.0	21.0	52.7	9.3

Table B10.1 Innovative enterprises that received financial support for innovation activities from government sources (number), 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of innovative enterprises																
Enterprises with innovation activity	***122***	***437***	***12***	***4***	74	338	6	0	66	338	0	0	47	99	6	4
Successful innovators	***20***	***19***	***0***	***4***	7	19	0	0	7	19	0	0	13	0	0	4
Enterprises with only on-going and/or abandoned innovations	***104***	***418***	***12***	***0***	67	319	6	0	59	319	0	0	37	99	6	0

Table B10.2 Innovative enterprises that received financial support for innovation activities from government sources (%), 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Percentage of innovative enterprises (%)																
Enterprises with innovation activity	***21.2***	***76.1***	***2.0***	***0.7***	13.0	58.8	1.1	0.0	11.5	58.8	0.0	0.0	8.2	17.3	1.0	0.7
Successful innovators	***47.2***	***43.8***	***0.0***	***9.0***	17.2	43.8	0.0	0.0	17.2	43.8	0.0	0.0	30.0	0.0	0.0	9.0
Enterprises with only on-going and/or abandoned innovations	***19.6***	***78.7***	***2.2***	***0.0***	12.6	60.0	1.1	0.0	11.0	60.0	0.0	0.0	7.0	18.7	1.1	0.0

Table B11.1 Sources of information for innovation rates as 'highly important' by innovative enterprises (number) 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of innovative enterprises																
Internal Sources																
Sources within your enterprise or enterprise group	***818***	***1 929***	***2 237***	***1 250***	327	1 309	1 239	864	311	1 300	1 229	836	490	619	999	386
External - Market Resources																
Suppliers of equipment, materials, components or software	***341***	***819***	***718***	***1 302***	131	586	365	446	118	584	365	429	210	234	353	856
Clients or customers	***475***	***1 566***	***2 700***	***1 418***	169	979	1 455	957	163	968	1 430	929	306	587	1 245	461
Competitors or other enterprises in your sector	***147***	***653***	***376***	***528***	61	567	79	279	52	555	79	279	85	86	298	249
Consultants, commercial labs or private R&D institutes	***115***	***457***	***110***	***5***	57	450	79	0	49	448	79	0	58	7	31	5
External - Institutional Sources																
Universities and Technikons	***41***	***158***	***102***	***5***	26	158	79	0	19	157	79	0	15	0	23	5
Government and Public Research institutes	***43***	***74***	***110***	***0***	7	74	110	0	4	74	110	0	36	0	0	0
External - Other Sources																
Conferences, trade fairs, exhibitions	***157***	***870***	***413***	***553***	75	545	107	368	64	545	101	368	82	325	306	186
Scientific journals and trade/ technical publications	***146***	***239***	***967***	***155***	46	239	965	150	41	239	965	150	99	0	3	5
Professional and industry associations	***137***	***444***	***106***	***154***	42	444	85	150	33	442	79	150	95	0	22	4

Table B11.2 Sources of information for innovation rates as 'highly important' by innovative enterprises (%) 2005 - 2007																
Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Percentage of innovative enterprises (%)																
Internal Sources																
Sources within your enterprise or enterprise group	***65.8***	***58.4***	***43.8***	***23.7***	68.0	53.1	54.1	26.3	67.3	54.3	54.9	25.6	64.4	74.3	35.4	19.6
External - Market Resources																
Suppliers of equipment, materials, components or software	***27.4***	***24.8***	***14.0***	***24.7***	27.1	23.7	15.9	13.6	25.6	24.4	16.3	13.2	27.6	28.0	12.5	43.3
Clients or customers	***38.2***	***47.4***	***52.8***	***26.9***	35.1	39.7	63.5	29.1	35.4	40.4	63.9	28.5	40.2	70.4	44.1	23.3
Competitors or other enterprises in your sector	***11.8***	***19.8***	***7.4***	***10.0***	12.7	23.0	3.4	8.5	11.3	23.1	3.5	8.6	11.2	10.3	10.6	12.6
Consultants, commercial labs or private R&D institutes	***9.3***	***13.8***	***2.1***	***0.1***	11.9	18.2	3.4	0.0	10.6	18.7	3.5	0.0	7.6	0.8	1.1	0.3
External - Institutional Sources																
Universities and Technikons	***3.3***	***4.8***	***2.0***	***0.1***	5.4	6.4	3.4	0.0	4.2	6.5	3.5	0.0	1.9	0.0	0.8	0.3
Government and Public Research institutes	***3.5***	***2.2***	***2.2***	***0.0***	1.4	3.0	4.8	0.0	0.8	3.1	4.9	0.0	4.8	0.0	0.0	0.0
External - Other Sources																
Conferences, trade fairs, exhibitions	***12.6***	***26.4***	***8.1***	***10.5***	15.6	22.1	4.7	11.2	13.9	22.7	4.5	11.3	10.7	39.0	10.9	9.4
Scientific journals and trade/ technical publications	***11.7***	***7.2***	***18.9***	***2.9***	9.6	9.7	42.1	4.6	8.9	10.0	43.1	4.6	13.1	0.0	0.1	0.3
Professional and industry associations	***11.0***	***13.4***	***2.1***	***2.9***	8.7	18.0	3.7	4.6	7.2	18.5	3.5	4.6	12.5	0.0	0.8	0.2

Table B12 Enterprises with innovation activity citing problems with their innovation activity, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of innovative enterprises																
Problems cited																
Abandoned in the concept stage	***301***	***1 080***	***1 119***	***83***	139	726	450	73	125	718	444	73	162	354	670	9
Abandoned after the activity or project was begun	***316***	***622***	***127***	***378***	161	501	91	368	150	495	79	351	155	122	36	10
Seriously delayed	***472***	***895***	***514***	***704***	211	861	113	509	200	849	101	509	261	33	401	195
Percentage of innovative enterprises (%)																
Problems cited																
Abandoned in the concept stage	***24.2***	***32.7***	***21.9***	***1.6***	28.8	29.4	19.6	2.2	27.1	30.0	19.8	2.2	21.3	42.5	23.7	0.5
Abandoned after the activity or project was begun	***25.4***	***18.9***	***2.5***	***7.2***	33.5	20.3	4.0	11.2	32.5	20.7	3.5	10.8	20.3	14.6	1.3	0.5
Seriously delayed	***38.0***	***27.1***	***10.1***	***13.4***	43.8	34.9	4.9	15.5	43.3	35.4	4.5	15.6	34.3	4.0	14.2	9.9

Table B13.1 'Highly important' factors that hampered innovation activities on innovative enterprises (number), 2005 -2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of innovative enterprises																
Cost Factors																
Lack of funds within your enterprise or group	***135***	***1 437***	***667***	***2 043***	84	1 097	306	1 712	82	1 087	299	1 712	51	340	362	331
Lack of finance from sources outside your enterprise	***89***	***376***	***395***	***1 592***	61	362	340	1 216	61	355	333	1 216	28	15	55	376
Innovation costs too high	***193***	***768***	***1 913***	***1 096***	87	414	1 292	1 079	86	351	1 286	1 079	106	354	621	17
Knowledge Factors																
Lack of qualified personnel	***265***	***1 331***	***74***	***938***	148	839	6	938	143	839	0	938	117	492	68	0
Lack of information on technology	***54***	***59***	***205***	***826***	41	59	189	708	41	59	189	708	13	0	16	118
Lack of information of markets	***68***	***183***	***418***	***764***	28	175	132	640	28	175	132	640	40	8	286	124
Difficulty in finding cooperation partners	***78***	***508***	***420***	***457***	52	501	116	436	49	498	110	436	26	6	303	21
Market Factors																
Market dominated by established enterprises	***203***	***382***	***1 023***	***1 295***	71	253	210	986	62	253	189	958	133	129	813	309
Uncertain demand for innovative goods or services	***104***	***405***	***226***	***686***	63	384	189	676	60	384	189	666	41	21	37	9
Reasons not to innovate																
No need due to prior innovations	***63***	***1***	***95***	***157***	18	0	79	157	18	0	79	157	45	1	16	0
No need because of no demand for innovations	***28***	***0***	***85***	***161***	10	0	79	157	10	0	79	157	18	0	6	5

Table B13.2 'Highly important' factors that hampered innovation activities on innovative enterprises (%), 2005 -2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Percentage of innovative enterprises																
Cost Factors																
Lack of funds within your enterprise or group	***10.9***	***43.5***	***13.1***	***38.8***	17.4	44.5	13.3	52.1	17.8	45.3	13.4	52.5	6.7	40.7	12.8	16.7
Lack of finance from sources outside your enterprise	***7.2***	***11.4***	***7.7***	***30.2***	12.7	14.7	14.8	37.0	13.3	14.8	14.9	37.3	3.7	1.7	2.0	19.0
Innovation costs too high	***15.6***	***23.3***	***37.4***	***20.8***	18.1	16.8	56.4	32.8	18.7	14.6	57.4	33.1	13.9	42.4	22.0	0.9
Knowledge Factors																
Lack of qualified personnel	***21.3***	***40.3***	***1.5***	***17.8***	30.8	34.0	0.3	28.5	31.0	35.0	0.0	28.8	15.3	59.1	2.4	0.0
Lack of information on technology	***4.3***	***1.8***	***4.0***	***15.7***	8.5	2.4	8.3	21.5	8.9	2.4	8.4	21.7	1.7	0.0	0.6	6.0
Lack of information of markets	***5.5***	***5.6***	***8.2***	***14.5***	5.8	7.1	5.8	19.5	6.1	7.3	5.9	19.6	5.2	0.9	10.1	6.3
Difficulty in finding cooperation partners	***6.3***	***15.4***	***8.2***	***8.7***	10.8	20.3	5.1	13.3	10.6	20.8	4.9	13.4	3.4	0.8	10.8	1.1
Market Factors																
Market dominated by established enterprises	***16.4***	***11.6***	***20.0***	***24.6***	14.7	10.2	9.2	30.0	13.4	10.5	8.4	29.4	17.4	15.5	28.8	15.6
Uncertain demand for innovative goods or services	***8.4***	***12.3***	***4.4***	***13.0***	13.1	15.6	8.3	20.6	13.0	16.0	8.4	20.4	5.4	2.5	1.3	0.5
Reasons not to innovate																
No need due to prior innovations	***5.0***	***0.0***	***1.9***	***3.0***	3.7	0.0	3.4	4.8	3.8	0.0	3.5	4.8	5.9	0.1	0.6	0.0
No need because of no demand for innovations	***2.2***	***0.0***	***1.7***	***3.1***	2.0	0.0	3.4	4.8	2.1	0.0	3.5	4.8	2.4	0.0	0.2	0.2

Table B13.3 'Highly important' factors that hampered innovation activities on non-innovative enterprises (number), 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of non-innovative enterprises																
Cost Factors																
Lack of funds within your enterprise or group	***58***	***259***	***774***	***977***	21	243	414	506	0	9	4	0	37	15	360	471
Lack of finance from sources outside your enterprise	***16***	***203***	***371***	***487***	1	184	319	258	0	184	319	250	14	20	52	229
Innovation costs too high	***63***	***246***	***370***	***787***	21	239	327	358	19	229	319	351	42	8	43	429
Knowledge Factors																
Lack of qualified personnel	***42***	***105***	***324***	***520***	13	96	324	206	12	91	319	200	29	9	0	314
Lack of information on technology	***21***	***46***	***236***	***240***	4	46	228	53	4	46	228	50	17	0	9	188
Lack of information of markets	***21***	***53***	***73***	***147***	4	46	47	53	4	46	46	50	17	8	26	94
Difficulty in finding cooperation partners	***13***	***61***	***192***	***197***	0	46	184	103	0	46	182	100.0	13	15	9	94
Market Factors																
Market dominated by established enterprises	***51***	***241***	***818***	***878***	12	236	370	461	12	229	365	451	40	4	448	417
Uncertain demand for innovative goods or services	***34***	***212***	***737***	***429***	12	187	323	208	12	183	319	200	22	24	414	220
Reasons not to innovate																
No need due to prior innovations	***59***	***96***	***270***	***490***	27	96	95	208	27	91	91	200	32	0	175	282
No need because of no demand for innovations	***65***	***158***	***211***	***482***	23	150	46	200	35	412	592	1 002	42	8	166	282

Table B13.4 'Highly important' factors that hampered innovation activities on non-innovative enterprises (%), 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Percentage of non-innovative enterprises																
Cost Factors																
Lack of funds within your enterprise or group	***4.6***	***7.8***	***15.1***	***18.6***	4.3	9.8	18.1	15.4	0.0	0.4	0.2	0.0	4.8	1.9	12.8	23.8
Lack of finance from sources outside your enterprise	***1.3***	***6.2***	***7.2***	***9.3***	0.3	7.4	13.9	7.9	0.0	7.7	14.2	7.7	1.9	2.4	1.8	11.6
Innovation costs too high	***5.0***	***7.5***	***7.2***	***15.0***	4.3	9.7	14.3	10.9	4.2	9.6	14.2	10.8	5.5	0.9	1.5	21.7
Knowledge Factors																
Lack of qualified personnel	***3.4***	***3.2***	***6.3***	***9.9***	2.7	3.9	14.2	6.3	2.5	3.8	14.2	6.1	3.8	1.1	0.0	15.9
Lack of information on technology	***1.7***	***1.4***	***4.6***	***4.6***	0.8	1.9	9.9	1.6	0.8	1.9	10.2	1.5	2.2	0.0	0.3	9.5
Lack of information of markets	***1.7***	***1.6***	***1.4***	***2.8***	0.8	1.9	2.1	1.6	0.8	1.9	2.0	1.5	2.3	0.9	0.9	4.8
Difficulty in finding cooperation partners	***1.1***	***1.9***	***3.8***	***3.7***	0.0	1.9	8.0	3.1	0.0	1.9	8.1	3.1	1.8	1.9	0.3	4.8
Market Factors																
Market dominated by established enterprises	***4.1***	***7.3***	***16.0***	***16.7***	2.4	9.6	16.1	14.0	2.5	9.6	16.3	13.8	5.2	0.5	15.9	21.1
Uncertain demand for innovative goods or services	***2.7***	***6.4***	***14.4***	***8.1***	2.4	7.6	14.1	6.3	2.5	7.6	14.2	6.1	2.9	2.9	14.7	11.2
Reasons not to innovate																
No need due to prior innovations	***4.8***	***2.9***	***5.3***	***9.3***	5.6	3.9	4.2	6.3	5.9	3.8	4.1	6.1	4.2	0.0	6.2	14.3
No need because of no demand for innovations	***5.2***	***4.8***	***4.1***	***9.2***	4.8	6.1	2.0	6.1	7.6	17.2	26.5	30.7	5.5	0.9	5.9	14.3

Table B14.1 Number of innovative and non-innovative enterprises that introduced organisational or marketing innovations, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Enterprises with innovation activity																
Organisational Innovations																
Knowledge management systems to better use or exchange information	***821***	***2 115***	***2 376***	***1 114***	286	1 331	450	907	272	1 268	434	907	535	785	1 926	207
Major changes to the organisation of work	***775***	***1 478***	***2 341***	***1 288***	310	1 162	1 336	890	293	1 152	1 298	890	465	315	1 005	398
External relations with other firms or public institutions	***551***	***739***	***898***	***1 488***	174	723	588	858	162	666	576	858	377	15	311	630
Marketing Innovations																
Design or packaging of a good or service	***518***	***1 223***	***1 382***	***985***	230	746	556	781	226	735	544	764	288	477	826	203
Sales or distribution methods	***410***	***791***	***1 860***	***660***	121	560	384	17	116	560	378	0	289	231	1 475	643
Enterprises without innovation activity																
Organisational Innovations																
Knowledge management systems to better use or exchange information	***101***	***130***	***312***	***167***	27	102	47	155	27	91	46	150	74	28	265	12
Major changes to the organisation of work	***107***	***187***	***420***	***452***	33	150	138	252	31	137	137	250	75	37	282	200
External relations with other firms or public institutions	***87***	***125***	***245***	***158***	31	109	228	52	31	91	228	50	56	15	17	106
Marketing Innovations																
Design or packaging of a good or service	***41***	***15***	***134***	***127***	16	0	91	100	16	0	91	100	25	15	43	27
Sales or distribution methods	***33***	***238***	***164***	***0***	12	137	138	0	12	137	137	0	22	101	26	0

Table B14.2 Percentage of innovative and non-innovative enterprises that introduced organisational or marketing innovations, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Proportion of enterprises with innovation activities (%)																
Organisational Innovations																
Knowledge management systems to better use or exchange information	***66.0***	***64.1***	***46.5***	***21.2***	59.4	53.9	19.6	27.6	58.8	52.9	19.4	27.8	70.2	94.1	68.3	10.5
Major changes to the organisation of work	***62.3***	***44.8***	***45.8***	***24.5***	64.3	47.1	58.3	27.1	63.5	48.1	58.0	27.3	61.0	37.8	35.7	20.1
External relations with other firms or public institutions	***44.3***	***22.4***	***17.6***	***28.3***	36.2	29.3	25.7	26.1	35.1	27.8	25.7	26.3	49.5	1.9	11.0	31.9
Marketing Innovations																
Design or packaging of a good or service	***41.7***	***37.0***	***27.0***	***18.7***	47.7	30.2	24.3	23.8	49.0	30.7	24.3	23.4	37.8	57.2	29.3	10.3
Sales or distribution methods	***33.0***	***24.0***	***36.4***	***12.5***	25.2	22.7	16.8	0.5	25.1	23.4	16.9	0.0	37.9	27.7	52.3	32.5
Proportion of enterprises without innovation activities (%)																
Organisational Innovations																
Knowledge management systems to better use or exchange information	***24.1***	***10.5***	***11.6***	***4.7***	22.3	12.4	3.9	9.0	22.6	11.8	3.8	9.1	24.9	6.7	17.8	0.7
Major changes to the organisation of work	***25.6***	***15.1***	***15.6***	***12.7***	26.7	18.2	11.4	14.7	25.8	17.6	11.5	15.2	25.2	8.8	19.0	10.8
External relations with other firms or public institutions	***20.8***	***10.1***	***9.1***	***4.4***	25.5	13.2	18.8	3.0	25.8	11.8	19.2	3.0	18.8	3.7	1.1	5.7
Marketing Innovations																
Design or packaging of a good or service	***9.8***	***1.2***	***5.0***	***3.6***	12.7	0.0	7.5	5.9	12.9	0.0	7.7	6.1	8.6	3.7	2.9	1.5
Sales or distribution methods	***8.0***	***19.2***	***6.1***	***0.0***	9.6	16.6	11.4	0.0	9.7	17.6	11.5	0.0	7.3	24.4	1.7	0.0

Table B15.1 Number of enterprises that secured a patent in SA or applied for at least one patent outside SA, 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of enterprises that secured a patent in SA																
All enterprises	***208***	***349***	***54***	***3***	109	342	52	3	99	342	46	0	98	6	3	0
Enterprises with innovation activity	***198***	***349***	***9***	***0***	106	342	6	0	95	342	0	0	93	6	3	0
Enterprises without innovation activity	***9***	***0***	***46***	***3***	4	0	46	3	4	0	46	0	5	0	0	0
Number of enterprises that applied for a patent outside SA																
All enterprises	***170***	***167***	***54***	***3***	94	167	52	3	93	167	46	0	76	0	3	0
Enterprises with innovation activity	***163***	***167***	***9***	***0***	91	167	6	0	89	167	0	0	73	0	3	0
Enterprises without innovation activity	***7***	***0***	***46***	***3***	4	0	46	3	4	0	46	0	3	0	0	0

Table B15.2 Percentage of enterprises that secured a patent in SA or applied for at least one patent outside SA, 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Proportion of enterprises that secured a patent in SA (%)																
All enterprises	***33.8***	***56.8***	***8.9***	***0.4***	17.8	55.8	8.4	0.4	16.1	55.8	7.4	0.0	16.0	1.0	0.5	0.0
Enterprises with innovation activity	***35.7***	***62.7***	***1.6***	***0.0***	19.0	61.6	1.1	0.0	17.1	61.6	0.0	0.0	16.7	1.1	0.5	0.0
Enterprises without innovation activity	***16.1***	***0.0***	***79.3***	***4.6***	6.8	0.0	79.3	4.6	6.8	0.0	79.3	0.0	9.4	0.0	0.0	0.0
Proportion of enterprises that applied for a patent outside SA (%)																
All enterprises	***43.1***	***42.4***	***13.8***	***0.7***	24.0	42.4	13.1	0.7	23.5	42.4	11.6	0.0	19.2	0.0	0.7	0.0
Enterprises with innovation activity	***48.2***	***49.2***	***2.6***	***0.0***	26.7	49.2	1.8	0.0	26.2	49.2	0.0	0.0	21.5	0.0	0.8	0.0
Enterprises without innovation activity	***12.0***	***0.0***	***83.2***	***4.8***	7.1	0.0	83.2	4.8	7.1	0.0	83.2	0.0	4.9	0.0	0.0	0.0

Table B16.1 Number of enterprises that made use of intellectual property rights, 2005-2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Type of intellectual property																
Enterprises with innovation activity (number)																
Registered an industrial design	***128***	***508***	***6***	***0***	90	501	6	0	85	501	0	0	38	6	0	0
Registered a trademark	***424***	***571***	***393***	***293***	170	555	377	293	165	555	365	293	254	17	16	0
Claimed copyright	***177***	***222***	***203***	***154***	85	220	132	150	84	220	132	150	92	2	71	4
Granted a license on any intellectual property rights resulting from innovation	***124***	***394***	***3***	***0***	56	387	0	0	54	387	0	0	68	7	3	0
Enterprises without innovation activity																
Registered an industrial design	***5***	***0***	***0***	***0***	0	0	0	0	0	0	0	0	5	0	0	0
Registered a trademark	***59***	***0***	***137***	***50***	19	0	137	50	19	0	137	50	40	0	0	0
Claimed copyright	***5***	***0***	***46***	***0***	0	0	46	0	0	0	46	0	5	0	0	0
Granted a license on any intellectual property rights resulting from innovation	***5***	***0***	***0***	***0***	0	0	0	0	0	0	0	0	5	0	0	0

Table B16.2 Percentage of enterprises that made use of intellectual property rights, 2005-2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Type of intellectual property																
Enterprises with innovation activity (%)																
Registered an industrial design	***10.3***	***15.4***	***0.1***	***0.0***	18.7	20.3	0.3	0.0	18.3	20.9	0.0	0.0	4.9	0.8	0.0	0.0
Registered a trademark	***34.1***	***17.3***	***7.7***	***5.6***	35.4	22.5	16.5	8.9	35.7	23.2	16.3	9.0	33.3	2.0	0.6	0.0
Claimed copyright	***14.2***	***6.7***	***4.0***	***2.9***	17.7	8.9	5.8	4.6	18.1	9.2	5.9	4.6	12.0	0.3	2.5	0.2
Granted a license on any intellectual property rights resulting from innovation	***9.9***	***11.9***	***0.1***	***0.0***	11.6	15.7	0.0	0.0	11.7	16.2	0.0	0.0	8.9	0.8	0.1	0.0

Enterprises without innovation activity (%)																
Registered an industrial design	***1.3***	***0.0***	***0.0***	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0
Registered a trademark	***14.1***	***0.0***	***5.1***	***1.4***	15.9	0.0	11.3	2.9	16.1	0.0	11.5	3.0	13.4	0.0	0.0	0.0
Claimed copyright	***1.2***	***0.0***	***1.7***	***0.0***	0.0	0.0	3.8	0.0	0.0	0.0	3.8	0.0	1.6	0.0	0.0	0.0
Granted a license on any intellectual property rights resulting from innovation	***1.3***	***0.0***	***0.0***	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0

Table B17.1 Geographic distribution of goods and services sold by innovative and non-innovative enterprises (number), 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of enterprises																
Geographic distribution – All enterprises																
South Africa (Only some provinces)	***465***	***1 741***	***3 807***	***5 163***	116	1 366	1 439	3 098	107	1 292	1 416	3 026	349	375	2 368	2 066
South Africa (National)	***1 154***	***2 816***	***3 945***	***2 981***	457	2 003	2 045	1 901	445	1 958	2 008	1 888	697	814	1 900	1 081
Rest of Africa	***645***	***1 608***	***1 828***	***1 004***	306	1 246	1 306	555	303	1 184	1 298	550	339	363	522	449
Europe	***322***	***985***	***1 548***	***638***	196	931	1 308	407	188	929	1 287	407	126	54	240	232
United States	***203***	***565***	***983***	***420***	115	551	953	408	110	551	931	407	88	14	30	12
Asia	***248***	***460***	***1 289***	***135***	136	446	1 073	2	133	444	1 052	0	112	14	216	133
Other Countries	***337***	***704***	***1 132***	***328***	189	567	1 101	208	184	565	1 095	207	148	136	30	120
Geographic distribution – Enterprises with innovation activity																
South Africa (Only some provinces)	***293***	***1 278***	***2 003***	***2 437***	87	983	697	1 751	79	925	687	1 723	205	295	1 306	686
South Africa (National)	***927***	***2 148***	***3 088***	***2 298***	372	1 652	1 580	1 538	359	1 638	1 552	1 538	556	496	1 508	760
Rest of Africa	***510***	***1 406***	***1 543***	***844***	252	1 152	1 213	449	249	1 092	1 207	449	258	254	330	394
Europe	***265***	***978***	***1 477***	***323***	177	931	1 262	306	168	929	1 241	306	88	47	214	17
United States	***174***	***565***	***920***	***318***	108	551	907	306	102	551	886	306	66	14	13	12
Asia	***183***	***460***	***1 264***	***12***	109	446	1 073	0	106	444	1 052	0	74	14	191	12
Other Countries	***276***	***557***	***1 023***	***183***	166	522	1 010	157	161	520	1 004	157	111	36	13	26

Table B17.1 continues on p 150

Table B17.1 Geographic distribution of goods and services sold by innovative and non-innovative enterprises (number), 2005 – 2007 *(continued from p 149)*

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Geographic distribution – Enterprises without innovation activity																
South Africa (Only some provinces)	***172***	***464***	***1 805***	***2 726***	29	383	742	1 346	27	366	729	1 302	143	81	1 062	1 380
South Africa (National)	***227***	***669***	***857***	***684***	86	351	465	363	86	320	456	351	141	318	392	320
Rest of Africa	***135***	***203***	***284***	***160***	54	94	93	106	54	91	91	100.0	81	109	192	54
Europe	***57***	***8***	***71***	***315***	19	0	46	100.0	27	0	0	188	38	8	26	215
United States	***29***	***0***	***63***	***102***	8	0	46	102	8	0	46	100.0	22	0	17	0
Asia	***65***	***0***	***26***	***123***	27	0	0	2	27	0	0	0	38	0	26	121
Other Countries	***61***	***147***	***108***	***146***	23	46	91	52	23	46	91	50	38	101	17	94

Table B17.2 Geographic distribution of goods and services sold by innovative and non-innovative enterprises (%), 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Proportion of enterprises (%)																
Geographic distribution – All enterprises																
South Africa (Only some provinces)	***27.7***	***38.3***	***48.7***	***58.5***	19.2	41.5	41.1	62.0	18.3	40.7	41.4	61.6	32.6	30.1	55.0	54.1
South Africa (National)	***68.9***	***62.0***	***50.5***	***33.8***	75.7	60.8	58.4	38.0	76.4	61.7	58.6	38.4	65.0	65.2	44.1	28.3
Rest of Africa	***38.5***	***35.4***	***23.4***	***11.4***	50.7	37.8	37.3	11.1	52.1	37.3	37.9	11.2	31.6	29.1	12.1	11.7
Europe	***19.2***	***21.7***	***19.8***	***7.2***	32.5	28.3	37.3	8.1	32.2	29.3	37.6	8.3	11.7	4.4	5.6	6.1
United States	***12.1***	***12.5***	***12.6***	***4.8***	19.1	16.7	27.2	8.2	18.9	17.4	27.2	8.3	8.2	1.2	0.7	0.3
Asia	***14.8***	***10.1***	***16.5***	***1.5***	22.6	13.5	30.6	0.0	22.8	14.0	30.7	0.0	10.4	1.2	5.0	3.5
Other Countries	***20.1***	***15.5***	***14.5***	***3.7***	31.3	17.2	31.4	4.2	31.7	17.8	32.0	4.2	13.9	10.9	0.7	3.1
Geographic distribution – Enterprises with innovation activity																
South Africa (Only some provinces)	***23.5***	***38.7***	***39.2***	***46.3***	18.1	39.8	30.4	53.3	17.2	38.6	30.7	52.9	27.0	35.3	46.3	34.7
South Africa (National)	***74.6***	***65.1***	***60.4***	***43.6***	77.1	66.9	68.9	46.7	77.8	68.4	69.3	47.1	72.9	59.5	53.5	38.5
Rest of Africa	***41.0***	***42.6***	***30.2***	***16.0***	52.3	46.7	52.9	13.7	53.9	45.6	53.9	13.8	33.9	30.5	11.7	20.0

Europe	***21.3***	***29.6***	***28.9***	***6.1***	36.7	37.7	55.1	9.3	36.4	38.8	55.4	9.4	11.6	5.6	7.6	0.8
United States	***14.0***	***17.1***	***18.0***	***6.0***	22.3	22.3	39.6	9.3	22.2	23.0	39.6	9.4	8.7	1.7	0.5	0.6
Asia	***14.7***	***13.9***	***24.7***	***0.2***	22.6	18.1	46.8	0.0	22.9	18.5	47.0	0.0	9.7	1.7	6.8	0.6
Other Countries	***22.2***	***16.9***	***20.0***	***3.5***	34.4	21.1	44.1	4.8	34.9	21.7	44.8	4.8	14.5	4.3	0.5	1.3

Geographic distribution – Enterprises without innovation activity

South Africa (Only some provinces)	***41.1***	***37.4***	***66.8***	***76.7***	23.5	46.4	61.3	78.8	22.6	47.1	61.5	78.8	48.3	19.5	71.3	74.8
South Africa (National)	***54.1***	***54.0***	***31.7***	***19.2***	70.1	42.5	38.4	21.2	71.0	41.1	38.5	21.2	47.5	76.8	26.3	17.4
Rest of Africa	***32.3***	***16.4***	***10.5***	***4.5***	44.6	11.4	7.6	6.2	45.2	11.8	7.7	6.1	27.2	26.2	12.9	2.9
Europe	***13.6***	***0.6***	***2.6***	***8.9***	15.9	0.0	3.8	5.9	22.4	0.0	0.0	11.4	12.7	1.9	1.7	11.6
United States	***7.0***	***0.0***	***2.3***	***2.9***	6.4	0.0	3.8	6.0	6.5	0.0	3.8	6.1	7.2	0.0	1.2	0.0
Asia	***15.5***	***0.0***	***1.0***	***3.5***	22.3	0.0	0.0	0.1	22.6	0.0	0.0	0.0	12.7	0.0	1.7	6.6
Other Countries	***14.6***	***11.8***	***4.0***	***4.1***	19.1	5.5	7.5	3.0	19.4	5.9	7.7	3.0	12.7	24.4	1.2	5.1

Table B18 Innovative enterprises that introduced organisational innovation that rated results as having a'high' level of importance, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	*Medium*	*Small*	*Very Small*	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of innovative enterprises																
Improved market share	***500***	***762***	***818***	***331***	164	497	170	123	164	495	170	123	336	265	648	208
Reduced time to respond to customer or supplier needs	***504***	***1 515***	***2 121***	***688***	183	929	1 124	497	181	928	1 101	497	320	586	997	191
Improved quality of your goods or services	***622***	***1 705***	***2 517***	***1 454***	220	1 203	1 488	1 229	214	1 196	1 488	1 229	402	502	1 029	226
Reduced costs per unit output	***391***	***579***	***794***	***830***	190	564	198	626	185	560	192	626	201	15	596	203
Improved employee satisfaction/ turnover	***363***	***616***	***1 290***	***492***	144	283	314	274	135	281	314	274	218	333	976	218
Proportion of innovative enterprises (%)																
Improved market share	***22.9***	***34.9***	***37.5***	***15.2***	7.5	22.8	7.8	5.7	7.5	22.7	7.8	5.7	15.4	12.1	29.7	9.5
Reduced time to respond to customer or supplier needs	***11.0***	***33.2***	***46.5***	***15.1***	4.0	20.4	24.6	10.9	4.0	20.3	24.1	10.9	7.0	12.8	21.8	4.2
Improved quality of your goods or services	***10.3***	***28.3***	***41.8***	***24.2***	3.7	20.0	24.7	20.4	3.6	19.9	24.7	20.4	6.7	8.3	17.1	3.7
Reduced costs per unit output	***16.3***	***24.2***	***33.2***	***34.7***	7.9	23.6	8.3	26.2	7.7	23.4	8.0	26.2	8.4	0.6	24.9	8.5
Improved employee satisfaction/ turnover	***14.5***	***24.6***	***51.5***	***19.6***	5.8	11.3	12.5	10.9	5.4	11.2	12.5	10.9	8.7	13.3	38.9	8.7

Table B19 Innovative enterprises that received financial support for innovation activities from government sources, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	*Medium*	*Small*	*Very Small*	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of innovative enterprises																
Source of financial support																
Metros and municipalities	***6***	***0***	***0***	***0***	0	0	0	0	0	0	0	0	6	0	0	0
Provincial government	***0***	***0***	***0***	***0***	0	0	0	0	0	0	0	0	0	0	0	0
National government	***75***	***94***	***0***	***4***	54	8	0	0	54	8	0	0	21	86	0	4
National funding agencies	***47***	***184***	***9***	***0***	38	170	6	0	30	170	0	0	9	13	3	0
Foreign government/public sources	***13***	***167***	***6***	***0***	0	167	0	0	0	167	0	0	13	0	6	0

Proportion of innovative enterprises (%)																
Source of financial support																
Metros and municipalities	***0.5***	***0.0***	***0.0***	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Provincial government	***0.0***	***0.0***	***0.0***	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
National government	***6.1***	***2.9***	***0.0***	***0.1***	11.2	0.3	0.0	0.0	11.7	0.3	0.0	0.0	2.8	10.3	0.0	0.2
National funding agencies	***3.8***	***5.6***	***0.2***	***0.0***	7.9	6.9	0.3	0.0	6.4	7.1	0.0	0.0	1.2	1.6	0.1	0.0
Foreign government/public sources	***1.0***	***5.1***	***0.1***	***0.0***	0.0	6.8	0.0	0.0	0.0	7.0	0.0	0.0	1.7	0.0	0.2	0.0

Table B20 Number and percentage of staff with a degree or diploma, 2007 (year specific question)

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Total number of staff																
Enterprises with innovation activity	***2 363 586***	***683 066***	***137 259***	***66 087***	809 037	622 605	91 575	51 124	528 962	607 040	78 288	50 925	1 554 549	60 461	45 684	14 963
Enterprises without innovation activity	***116 163***	***50 112***	***59 336***	***45 000***	52 016	44 557	35 007	28 849	51 503	40 429	33 900	24 792	64 147	5 555	24 329	16 151
Number of staff with Degree or Diploma																
Enterprises with innovation activity	***214 933***	***33 533***	***11 180***	***6 877***	81 192	26 294	2 706	4 811	5 761	17 803	11 001	47 515	133 740	7 239	8 475	2 066
Enterprises without innovation activity	***10 035***	***2 073***	***2 507***	***2 690***	6 886	1 594	1 377	1 424	1 493	2 881	7 427	14 575	3 149	479	1 130	1 266
Proportion of staff with Degree or Diploma (%)																
Enterprises with innovation activity	***9.1***	***4.9***	***8.1***	***10.4***	10.0	4.2	3.0	9.4	2.9	7.1	21.9	58.8	8.6	12.0	18.6	13.8
Enterprises without innovation activity	***8.6***	***4.1***	***4.2***	***6.0***	13.2	3.6	3.9	4.9	1.1	2.9	14.1	93.3	4.9	8.6	4.6	7.8

Table B21 Enterprises with organisational and/or marketing innovations, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of enterprises																
Enterprises with organisational innovation	***1 198***	***2 782***	***4 478***	***3 247***	436	1 918	1 953	2 209	414	1 822	1 914	2 204	762	864	2 525	1 038
Enterprises with marketing innovation	***769***	***1 550***	***2 317***	***1 552***	294	957	740	882	285	946	727	864	475	593	1 577	670
Innovative enterprises with organisational and/or marketing innovation	***1 115***	***2 619***	***3 896***	***3 062***	436	1 799	1 679	2 224	416	1 728	1 641	2 206	678	820	2 217	838
Product Only Innovative enterprises with organisational and/or marketing innovation	***102***	***372***	***858***	***608***	22	271	229	422	22	271	223	422	80	101	629	186
Process Only Innovative enterprises with organisational and/or marketing innovation	***200***	***482***	***580***	***714***	66	481	214	279	60	418	199	279	134	1	367	435
Product and Process Innovative enterprises with organisational and/or marketing innovation	***813***	***1 765***	***2 458***	***1 739***	348	1 047	1 236	1 522	335	1 039	1 219	1 505	464	717	1 222	217
Non-Innovative enterprises with organisational innovation	***181***	***252***	***583***	***555***	56	207	275	355	54	183	273	351	125	44	308	200
Non-Innovative enterprises with marketing innovation	***49***	***116***	***151***	***127***	4	0	91	100.0	19	137	182	100.0	45	116	60	27
Non-Innovative enterprises with organisational	***140***	***215***	***590***	***682***	44	70	273	455	43	46	273	451	96	145	317	227
Non-Innovative enterprises with organisational	***53***	***145***	***118***	***0***	16	137	93	0	16	137	91	0	38	8	26	0
Percentage enterprises with organizational and/ or marketing innovations (%)																
Enterprises with organisational innovation	***71.5***	***61.3***	***57.3***	***36.8***	72.2	58.2	55.7	44.2	71.1	57.4	55.9	44.9	71.2	69.3	58.6	27.2
Enterprises with marketing innovation	***45.9***	***34.1***	***29.7***	***17.6***	48.7	29.0	21.1	17.6	48.9	29.8	21.2	17.6	44.3	47.5	36.6	17.5

Innovative enterprises with organisational and/or marketing innovation	***89.7***	***79.3***	***76.2***	***58.2***	90.6	72.9	73.2	67.6	90.2	72.1	73.3	67.7	89.1	98.4	78.6	42.4
Product Only Innovative enterprises with organisational and/or marketing innovation	***8.2***	***11.3***	***16.8***	***11.6***	4.5	11.0	10.0	12.8	4.7	11.3	10.0	13.0	10.5	12.2	22.3	9.4
Process Only Innovative enterprises with organisational and/or marketing innovation	***16.1***	***14.6***	***11.4***	***13.6***	13.7	19.5	9.3	8.5	12.9	17.5	8.9	8.6	17.6	0.1	13.0	22.0
Product and Process Innovative enterprises with organisational and/or marketing innovation	***65.4***	***53.4***	***48.1***	***33.0***	72.3	42.4	53.9	46.3	72.5	43.3	54.5	46.1	61.0	86.1	43.3	11.0
Non-Innovative enterprises with organisational innovation	***43.3***	***20.3***	***21.6***	***15.6***	45.8	25.1	22.7	20.8	45.2	23.5	23.1	21.2	42.2	10.7	20.7	10.8
Non-Innovative enterprises with marketing innovation	***11.7***	***9.4***	***5.6***	***3.6***	3.2	0.0	7.5	5.9	16.1	17.6	15.4	6.1	15.2	28.1	4.0	1.5
Non-Innovative enterprises with organisational	***33.3***	***17.4***	***21.8***	***19.2***	36.3	8.5	22.6	26.6	35.5	5.9	23.1	27.3	32.1	35.1	21.3	12.3
Non-Innovative enterprises with organisational	***12.7***	***11.7***	***4.4***	***0.0***	12.7	16.6	7.6	0.0	12.9	17.6	7.7	0.0	12.6	1.9	1.7	0.0

Table B22.1 Collaborative partnerships for innovation activities by type of partner, 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of innovative enterprises																
Collaborative partnerships																
Other enterprises within your enterprise group	***446***	***765***	***153***	***353***	197	531	122	353	180	531	122	353	249	234	31	0
Suppliers of equipment, materials, components or software	***531***	***1074***	***898***	***1025***	229	836	500	998	208	834	490	998	303	238	399	27
Clients or customers	***475***	***1217***	***933***	***1025***	208	976	500	998	193	973	490	998	266	242	433	27
Competitors or other enterprises in your sector	***304***	***743***	***544***	***785***	136	509	154	781	120	506	144	781	168	234	390	4
Consultants, commercial labs or private R&D institutes	***370***	***860***	***186***	***876***	160	624	154	855	140	622	144	855	210	235	32	21
Universities or Technikons	***300***	***817***	***177***	***513***	132	590	154	502	115	589	144	502	168	227	23	11
Government or Public Research institutes	***251***	***735***	***909***	***508***	102	508	264	502	88	506	254	502	149	227	645	5
Percentage of innovative enterprises																
Collaborative partnerships																
Other enterprises within your enterprise group	***35.8***	***23.2***	***3.0***	***6.7***	40.8	21.5	5.3	10.7	39.0	22.2	5.5	10.8	32.7	28.1	1.1	0.0
Suppliers of equipment, materials, components or software	***42.7***	***32.5***	***17.6***	***19.5***	47.4	33.9	21.8	30.3	45.2	34.8	21.9	30.6	39.8	28.5	14.1	1.3
Clients or customers	***38.2***	***36.9***	***18.3***	***19.5***	43.2	39.5	21.8	30.3	41.9	40.6	21.9	30.6	35.0	29.0	15.4	1.3
Competitors or other enterprises in your sector	***24.5***	***22.5***	***10.6***	***14.9***	28.2	20.6	6.7	23.8	26.0	21.1	6.4	24.0	22.1	28.1	13.8	0.2
Consultants, commercial labs or private R&D institutes	***29.8***	***26.0***	***3.6***	***16.6***	33.3	25.3	6.7	26.0	30.4	26.0	6.4	26.2	27.6	28.2	1.1	1.1
Universities or Technikons	***24.1***	***24.7***	***3.5***	***9.7***	27.4	23.9	6.7	15.3	25.0	24.6	6.4	15.4	22.0	27.2	0.8	0.5
Government or Public Research institutes	***20.2***	***22.3***	***17.8***	***9.6***	21.1	20.6	11.5	15.3	19.1	21.1	11.4	15.4	19.6	27.2	22.9	0.3

Table B22.2 Collaborative partnerships for innovation activities by type of partner and their location (number), 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of enterprises																
Location of partner																
Other enterprises within your enterprise group																
South Africa	***255***	***422***	***147***	***353***	119	412	122	353	103	412	122	353	136	10	25	0
Rest of Africa	***41***	***0***	***9***	***0***	17	0	0	0	12	0	0	0	24	0	9	0
Europe	***235***	***273***	***9***	***0***	102	272	0	0	100.0	272	0	0	133	1	9	0
USA	***142***	***175***	***12***	***0***	59	175	0	0	59	175	0	0	83	0	12	0
Asia	***91***	***0***	***52***	***0***	29	0	46	0	29	0	0	0	63	0	6	0
Other Countries	***65***	***414***	***6***	***0***	13	190	0	0	12	190	0	0	52	224	6	0
Suppliers of equipment, materials, components or software																
South Africa	***386***	***567***	***845***	***881***	163	561	474	855	143	559	468	855	222	6	371	27
Rest of Africa	***4***	***0***	***0***	***150***	2	0	0	150	2	0	0	150	2	0	0	0
Europe	***295***	***726***	***40***	***162***	129	491	22	150	122	489	22	150	166	235	19	12
USA	***131***	***185***	***9***	***0***	39	175	0	0	37	175	0	0	92	10	9	0
Asia	***128***	***125***	***8***	***155***	42	121	0	143	41	121	0	143	86	5	8	12
Other Countries	***33***	***108***	***20***	***0***	11	108	4	0	8	108	0	0	22	0	15	0
Clients or customers																
South Africa	***408***	***1 058***	***823***	***1 025***	167	816	389	998	152	815	379	998	241	242	433	27
Rest of Africa	***126***	***168***	***9***	***167***	41	168	6	150	39	167	0	150	84	0	3	17
Europe	***150***	***309***	***113***	***162***	73	300	110	150	73	300	110	150	76	9	3	12
USA	***113***	***292***	***3***	***162***	57	292	0	150	57	292	0	150	56	0	3	12
Asia	***95***	***0***	***0***	***12***	40	0	0	0	40	0	0	0	55	0	0	12
Other Countries	***36***	***251***	***0***	***17***	21	251	0	0	19	251	0	0	15	0	0	17

Table B22.2 continues on p 158

Table B22.2 Collaborative partnerships for innovation activities by type of partner and their location (number), 2005 – 2007 *(continued from p 157)*

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Competitors or other enterprises in your sector																
South Africa	***260***	***469***	***540***	***785***	111	235	150	781	95	233	144	781	149	234	390	4
Rest of Africa	***41***	***1***	***6***	***150***	16	1	6	150	16	0	0	150	25	0	0	0
Europe	***76***	***3***	***3***	***150***	36	0	0	150	36	0	0	150	40	3	3	0
USA	***48***	***25***	***3***	***150***	23	22	0	150	23	22	0	150	25	2	3	0
Asia	***42***	***2***	***3***	***0***	19	0	0	0	19	0	0	0	23	2	3	0
Other Countries	***27***	***274***	***4***	***0***	13	274	4	0	13	274	0	0	14	0	0	0
Consultants, commercial labs or private R&D institutes																
South Africa	***298***	***523***	***182***	***876***	150	512	150	855	129	510	144	855	148	11	32	21
Rest of Africa	***8***	***22***	***0***	***4***	5	22	0	0	5	22	0	0	3	0	0	4
Europe	***125***	***167***	***3***	***150***	42	167	0	150	40	167	0	150	83	0	3	0
USA	***101***	***167***	***3***	***0***	15	167	0	0	15	167	0	0	86	0	3	0
Asia	***18***	***0***	***0***	***0***	14	0	0	0	14	0	0	0	3	0	0	0
Other Countries	***22***	***314***	***4***	***0***	7	90	4	0	0	90	0	0	15	224	0	0
Universities or Technikons																
South Africa	***10***	***0***	***0***	***0***	7	0	0	0	106	499	144	502	3	0	0	0
Rest of Africa	***267***	***727***	***173***	***508***	123	500	150	502	2	0	0	0	144	227	23	5
Europe	***2***	***0***	***3***	***0***	2	0	0	0	25	175	0	150	0	0	3	0
USA	***70***	***175***	***3***	***155***	27	175	0	150	13	0	0	150	43	0	3	5
Asia	***47***	***0***	***3***	***155***	13	0	0	150	7	0	0	0	34	0	3	5
Other Countries	***21***	***90***	***4***	***0***	7	90	4	0	4	90	0	0	14	0	0	0
Government or Public Research institutes																
South Africa	***231***	***477***	***905***	***353***	96	251	260	353	83	249	254	353	135	227	645	0
Rest of Africa	***6***	***0***	***0***	***0***	6	0	0	0	6	0	0	0	0	0	0	0
Europe	***20***	***2***	***285***	***5***	12	0	0	0	12	0	0	0	8	2	285	5
USA	***27***	***169***	***3***	***0***	7	167	0	0	7	167	0	0	19	2	3	0
Asia	***7***	***2***	***0***	***0***	7	0	0	0	7	0	0	0	0	2	0	0
Other Countries	***0***	***90***	***4***	***150***	0	90	4	150	0	90	0	150	0	0	0	0

Table B22.3 Collaborative partnerships for innovation activities by type of partner and their location (%), 2005 – 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Percentage of enterprises (%)																
Location of partner																
Other enterprises within your enterprise group																
South Africa	***20.5***	***12.8***	***2.9***	***6.7***	24.7	16.7	5.3	10.7	22.4	17.2	5.5	10.8	17.9	1.1	0.9	0.0
Rest of Africa	***3.3***	***0.0***	***0.2***	***0.0***	3.5	0.0	0.0	0.0	2.6	0.0	0.0	0.0	3.2	0.0	0.3	0.0
Europe	***18.9***	***8.3***	***0.2***	***0.0***	21.1	11.0	0.0	0.0	21.7	11.3	0.0	0.0	17.5	0.1	0.3	0.0
USA	***11.4***	***5.3***	***0.2***	***0.0***	12.2	7.1	0.0	0.0	12.8	7.3	0.0	0.0	10.9	0.0	0.4	0.0
Asia	***7.3***	***0.0***	***1.0***	***0.0***	5.9	0.0	2.0	0.0	6.2	0.0	0.0	0.0	8.2	0.0	0.2	0.0
Other Countries	***5.3***	***12.5***	***0.1***	***0.0***	2.7	7.7	0.0	0.0	2.6	7.9	0.0	0.0	6.9	26.9	0.2	0.0
Suppliers of equipment, materials, components or software																
South Africa	***31.0***	***17.2***	***16.5***	***16.7***	33.9	22.8	20.7	26.0	31.0	23.3	20.9	26.2	29.2	0.7	13.2	1.3
Rest of Africa	***0.3***	***0.0***	***0.0***	***2.8***	0.5	0.0	0.0	4.6	0.5	0.0	0.0	4.6	0.2	0.0	0.0	0.0
Europe	***23.7***	***22.0***	***0.8***	***3.1***	26.7	19.9	0.9	4.6	26.4	20.4	1.0	4.6	21.8	28.3	0.7	0.6
USA	***10.5***	***5.6***	***0.2***	***0.0***	8.1	7.1	0.0	0.0	8.1	7.3	0.0	0.0	12.1	1.2	0.3	0.0
Asia	***10.3***	***3.8***	***0.2***	***2.9***	8.8	4.9	0.0	4.4	8.8	5.0	0.0	4.4	11.3	0.5	0.3	0.6
Other Countries	***2.6***	***3.3***	***0.4***	***0.0***	2.3	4.4	0.2	0.0	1.8	4.5	0.0	0.0	2.8	0.0	0.5	0.0
Clients or customers																
South Africa	***32.8***	***32.1***	***16.1***	***19.5***	34.7	33.1	17.0	30.3	32.9	34.0	16.9	30.6	31.6	29.0	15.4	1.3
Rest of Africa	***10.1***	***5.1***	***0.2***	***3.2***	8.5	6.8	0.3	4.6	8.5	7.0	0.0	4.6	11.1	0.0	0.1	0.9
Europe	***12.0***	***9.4***	***2.2***	***3.1***	15.2	12.1	4.8	4.6	15.9	12.5	4.9	4.6	10.0	1.1	0.1	0.6
USA	***9.1***	***8.8***	***0.1***	***3.1***	11.8	11.8	0.0	4.6	12.3	12.2	0.0	4.6	7.3	0.0	0.1	0.6
Asia	***7.6***	***0.0***	***0.0***	***0.2***	8.3	0.0	0.0	0.0	8.7	0.0	0.0	0.0	7.2	0.0	0.0	0.6
Other Countries	***2.9***	***7.6***	***0.0***	***0.3***	4.3	10.2	0.0	0.0	4.1	10.5	0.0	0.0	2.0	0.0	0.0	0.9

Table B22.3 continues on p 160

Table B22.3 Collaborative partnerships for innovation activities by type of partner and their location (%), 2005 – 2007 *(continued from p 159)*

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Competitors or other enterprises in your sector																
South Africa	***20.9***	***14.2***	***10.6***	***14.9***	23.1	9.5	6.5	23.8	20.7	9.7	6.4	24.0	19.6	28.1	13.8	0.2
Rest of Africa	***3.3***	***0.0***	***0.1***	***2.8***	3.4	0.0	0.3	4.6	3.5	0.0	0.0	4.6	3.3	0.0	0.0	0.0
Europe	***6.1***	***0.1***	***0.1***	***2.8***	7.5	0.0	0.0	4.6	7.8	0.0	0.0	4.6	5.2	0.4	0.1	0.0
USA	***3.8***	***0.7***	***0.1***	***2.8***	4.7	0.9	0.0	4.6	4.9	0.9	0.0	4.6	3.3	0.3	0.1	0.0
Asia	***3.3***	***0.1***	***0.1***	***0.0***	3.9	0.0	0.0	0.0	4.1	0.0	0.0	0.0	3.0	0.3	0.1	0.0
Other Countries	***2.2***	***8.3***	***0.1***	***0.0***	2.7	11.1	0.2	0.0	2.8	11.4	0.0	0.0	1.9	0.0	0.0	0.0
Consultants, commercial labs or private R&D institutes																
South Africa	***23.9***	***15.8***	***3.6***	***16.6***	31.0	20.7	6.5	26.0	28.0	21.3	6.4	26.2	19.4	1.3	1.1	1.1
Rest of Africa	***0.6***	***0.7***	***0.0***	***0.1***	1.0	0.9	0.0	0.0	1.0	0.9	0.0	0.0	0.4	0.0	0.0	0.2
Europe	***10.1***	***5.1***	***0.1***	***2.8***	8.8	6.8	0.0	4.6	8.8	7.0	0.0	4.6	10.9	0.0	0.1	0.0
USA	***8.1***	***5.1***	***0.1***	***0.0***	3.2	6.8	0.0	0.0	3.3	7.0	0.0	0.0	11.3	0.0	0.1	0.0
Asia	***1.4***	***0.0***	***0.0***	***0.0***	3.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Other Countries	***1.8***	***9.5***	***0.1***	***0.0***	1.4	3.6	0.2	0.0	0.0	3.8	0.0	0.0	2.0	26.9	0.0	0.0
Universities or Technikons																
South Africa	***0.8***	***0.0***	***0.0***	***0.0***	1.5	0.0	0.0	0.0	22.9	20.8	6.4	15.4	0.4	0.0	0.0	0.0
Rest of Africa	***21.4***	***22.0***	***3.4***	***9.6***	25.4	20.3	6.5	15.3	0.5	0.0	0.0	0.0	18.9	27.2	0.8	0.3
Europe	***0.2***	***0.0***	***0.1***	***0.0***	0.5	0.0	0.0	0.0	5.4	7.3	0.0	4.6	0.0	0.0	0.1	0.0
USA	***5.6***	***5.3***	***0.1***	***2.9***	5.6	7.1	0.0	4.6	2.8	0.0	0.0	4.6	5.7	0.0	0.1	0.3
Asia	***3.7***	***0.0***	***0.1***	***2.9***	2.7	0.0	0.0	4.6	1.6	0.0	0.0	0.0	4.4	0.0	0.1	0.3
Other Countries	***1.7***	***2.7***	***0.1***	***0.0***	1.5	3.6	0.2	0.0	0.8	3.8	0.0	0.0	1.8	0.0	0.0	0.0
Government or Public Research institutes																
South Africa	***18.6***	***14.5***	***17.7***	***6.7***	19.9	10.2	11.4	10.7	17.9	10.4	11.4	10.8	17.7	27.2	22.9	0.0
Rest of Africa	***0.5***	***0.0***	***0.0***	***0.0***	1.2	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Europe	***1.6***	***0.1***	***5.6***	***0.1***	2.4	0.0	0.0	0.0	2.6	0.0	0.0	0.0	1.1	0.3	10.1	0.3
USA	***2.1***	***5.1***	***0.1***	***0.0***	1.5	6.8	0.0	0.0	1.6	7.0	0.0	0.0	2.6	0.3	0.1	0.0
Asia	***0.6***	***0.1***	***0.0***	***0.0***	1.5	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Other Countries	***0.0***	***2.7***	***0.1***	***2.8***	0.0	3.6	0.2	4.6	0.0	3.8	0.0	4.6	0.0	0.0	0.0	0.0

Table B23 Innovative enterprises performing process innovations, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of process innovators	***1 113***	***2 878***	***3 741***	***3 620***	451	2 152	1 565	2 247	431	2 081	1 518	2 219	662	726	2 176	1 373
Percentage of process innovators (%)	***66.5***	***63.4***	***47.9***	***41.0***	74.8	65.4	44.7	44.9	74.1	65.6	44.3	45.2	61.8	58.2	50.5	35.9

Table B24 Innovative enterprises performing specific process innovations, 2005 - 2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of process innovators																
Methods of manufacturing or production	***647***	***1 900***	***2 510***	***1 975***	351	1 559	1 494	1 763	341	1 543	1 452	1 735	296	341	1 015	212
Delivery or distribution methods	***589***	***967***	***1 080***	***909***	175	838	232	447	170	828	189	447	414	128	848	462
Supporting Activities	***869***	***2 274***	***1 922***	***2 806***	311	1 787	551	1 433	292	1 717	532	1 433	558	487	1 371	1 373
Percentage of process innovators (%)																
Methods of manufacturing or production	***9.2***	***27.0***	***35.7***	***28.1***	5.0	22.2	21.2	25.1	4.8	21.9	20.6	24.7	4.2	4.9	14.4	3.0
Delivery or distribution methods	***16.7***	***27.4***	***30.6***	***25.7***	5.0	23.7	6.6	12.7	4.8	23.4	5.4	12.7	11.7	3.6	24.0	13.1
Supporting Activities	***11.0***	***28.9***	***24.4***	***35.6***	3.9	22.7	7.0	18.2	3.7	21.8	6.8	18.2	7.1	6.2	17.4	17.4

Table B25 Responsibility for process innovations, 2005-2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of process innovators																
All process innovators	***1 113***	***2 878***	***3 741***	***3 620***	451	2 152	1 565	2 247	431	2 081	1 518	2 219	662	726	2 176	1 373
Mainly yours	***556***	***1 268***	***2 770***	***2 048***	232	1 115	1 281	1 650	224	1 107	1 241	1 622	325	153	1 488	398
Yours together with others	***355***	***1 247***	***396***	***570***	142	703	85	447	129	638	79	447	213	544	311	123
Mainly others	***195***	***364***	***575***	***1 002***	78	335	199	150	78	335	199	150	117	29	377	852
Enterprises which did not respond to the question	***6***	***0***	***0***	***0***	0	0	0	0	0	0	0	0	6	0	0	0
Percentage of process innovators (%)																
All process innovators	***100.0***	***100.0***	***100.0***	***100.0***	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mainly yours	***50.0***	***44.1***	***74.0***	***56.6***	51.3	51.8	81.9	73.4	52.0	53.2	81.7	73.1	49.1	21.1	68.4	29.0
Yours together with others	***31.9***	***43.3***	***10.6***	***15.7***	31.4	32.6	5.4	19.9	29.9	30.7	5.2	20.1	32.2	74.9	14.3	9.0
Mainly others	***17.5***	***12.6***	***15.4***	***27.7***	17.3	15.6	12.7	6.7	18.1	16.1	13.1	6.7	17.7	4.0	17.3	62.0
Enterprises which did not respond to the question	***0.6***	***0.0***	***0.0***	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0

Table B26 Origin of process innovations, 2005-2007

Size Classes	*Total*				Industry				Manufacturing*				Services			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of process innovators																
Origin of process innovation																
All process innovators	***1 256***	***3 301***	***5 112***	***5 265***	482	2 468	2 292	3 289	723	3 828	4 159	5 548	774	834	2 820	1 976
South Africa	***715***	***2 344***	***3 685***	***2 364***	312	1 858	1 543	1 594	293	1 787	1 497	1 566	402	486	2 142	770
Abroad	***392***	***534***	***55***	***1 256***	139	294	22	653	138	294	22	653	253	240	34	603
Enterprises which did not respond to the question	***149***	***423***	***1 371***	***1 645***	30	316	727	1 042	292	1 748	2 640	3 329	119	108	644	603
Percentage of process innovators (%)																
Origin of process innovation																
All process innovators	***100.0***	***100.0***	***100.0***	***100.0***	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

South Africa	***56.9***	***71.0***	***72.1***	***44.9***	64.9	75.3	67.3	48.5	40.6	46.7	36.0	28.2	52.0	58.3	76.0	39.0
Abroad	***31.2***	***16.2***	***1.1***	***23.9***	28.8	11.9	0.9	19.8	19.1	7.7	0.5	11.8	32.7	28.8	1.2	30.5
Enterprises which did not respond to the question	***11.9***	***12.8***	***26.8***	***31.2***	6.3	12.8	31.7	31.7	40.3	45.6	63.5	60.0	15.4	12.9	22.9	30.5

Table B27 Enterprises which introduced new or improved products to the market as a percentage of enterprises engaged in innovation activity by sector, 2005-2007

Size Classes	***Total***				**Industry**				**Manufacturing***				**Services**			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
All innovators	1 256	3 301	5 112	5 265	482	2 468	2 292	3 289	462	2 396	2 239	3 261	774	834	2 820	1 976
All Product innovators	1 016	2 698	4 136	3 763	413	1 866	1 984	2 942	400	1 857	1 962	2 914	603	833	2 152	820
Innovations new to the market	693	1 697	3 046	1 764	283	1 324	1 397	1 551	277	1 318	1 381	1 534	410	373	1 648	212
Innovations new to the firm	738	2 058	2 960	2 791	287	1 272	1 492	2 579	277	1 263	1 476	2 568	451	786	1 468	212
Percentage of enterprises (% of all innovators)																
All product innovators																
Innovations new to the market	41.4	37.4	39.0	20.0	46.8	40.2	39.9	31.0	47.5	41.5	40.3	31.2	38.3	29.9	38.3	5.6
Innovations new to the firm	44.0	45.3	37.9	31.6	47.6	38.6	42.6	51.6	47.6	39.8	43.1	52.3	42.0	63.0	34.1	5.5

Table B28 Number and percentage of enterprises that stated they were part of a larger group, 2005 - 2007

Size Classes	***Total***				**Innovative**				**Non-innovative**			
	Large	***Medium***	***Small***	***Very Small***	Large	Medium	Small	Very Small	Large	Medium	Small	Very Small
Number of enterprises												
Enterprise group status												
Part of a larger group	***1 041***	***1 156***	***1 725***	***566***	821	755	1 451	511	220	400	274	56
Not part of a larger group	***634***	***3 385***	***6 088***	***8 254***	423	2 546	3 661	4 754	211	839	2 427	3 500
Percentage of enterprises (%)												
Enterprise group status												
Part of a larger group	***4.6***	***5.1***	***7.5***	***2.5***	5.5	5.1	9.7	3.4	2.8	5.0	3.5	0.7
Not part of a larger group	***2.8***	***14.8***	***26.6***	***36.1***	2.8	17.1	24.5	31.9	2.7	10.6	30.6	44.1

Table B29 Innovative enterprises involved in intramural R&D continuously or occasionally, 2005 - 2007					
Size Classes	Large	Medium	Small	Very Small	***Total***
Number of enterprises					
Continuously	490	1,247	1,184	304	***3,225***
Occassionally	256	1,114	1,164	924	***3,458***
Percentage of enterprises (%)					
Continuously	39.0	37.8	23.2	5.8	***19.8***
Occassionally	20.4	33.7	22.8	17.6	***21.3***

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