National Accounts

Socio-Economic Integration

Compendium of industrial statistics: Knowledge, productivity and innovation

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Knowledge, Productivity and Innovation

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Preface

Measuring economic progress is an important and valuable task for a Statistical Office as it serves as an extension to a regular industrial statistics programme. The Compendium of Industrial Statistics is designed to inform public discussion of the overall picture of economic activity within and across industries comprising the South African manufacturing sector. Information included in this document is for the reference period 2003–2007.

The Compendium is not a scorecard for government policy. It is an experimental publication, which in keeping pace with meeting user needs, will develop and evolve over time.

PJ Lehohla
Statistician-General

Pretoria
December 2008

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List of symbols and abbreviations

,	decimal separators
..	data are not available or not reported
—	amount is nil or negligible
=	equals to
≡	identical to
≈	approximately
~	equivalent to
+	plus
-	minus
*	multiplication
/	division, or to denote an either or if used in a sentence
%	per cent
Σ	sum of
| |	absolute value
{ }	inclusive of
( ),[ ]	brackets
n.a.	not applicable
n.e.c.	not elsewhere classified
n.e.s.	not elsewhere specified
R&D	research and development

List of interchangeable/synonymous terms

depreciation	consumption of fixed capital
salaries and wages	compensation of employees
compensation of employees	income share of labour in total industry income
intermediate expenses	intermediate consumption
output	total sales of manufactured produce or just total sales
turnover	sales
workforce	labour force
multifactor productivity	total factor productivity
operating profit	gross operating surplus, or profit before interest and taxes
gross operating surplus	income share of capital in total industry income
undistributed profit	retained earnings, or profit after tax and dividends
rate of return	expected yield from investment
capital expenditure	gross investment
fixed investment	investment in fixed assets; gross fixed capital formation
nominal price	current price
real price	inflation-adjusted price (inflation is removed from nominal price)
aggregate prices	general price level
firm	enterprise
market	industry
gains from trade	real net exports (BLS, 1997: 155)
gross	total

Reporting practices

According to UNIDO (2005: 7, 9) the reporting convention on industrial statistics gives countries a choice between Revision 2 or Revision 3 of the International Standard Industrial Classification of All Economic Activities (ISIC). The reporting format in this edition of the Compendium follows Revision 2 applied to the three-digit manufacturing level.

Classifications employed in the Compendium and the resultant grouping of information this creates are intended for statistical convenience and do not express a judgment about the state reached by a particular industry in its degree of development or regarding its economic system. Furthermore any mention of firm names or commercial products does not imply endorsement by Statistics South Africa.

The data in the Compendium derives from samples, which by specification are not designed at the three-digit level, i.e. branch level, of the manufacturing sector. It is drawn from various annual sources within Statistics South Africa including the annual financial survey, labour force survey, as well as unpublished records of price statistics and national accounts for the period 2003–2007.

Periods set off by a hyphen such as 2003–2007, include the beginning and end time of the period.

Information is either expressed in amount totals, counts, ratios or percentages as indicated. Totals may not add precisely because of rounding. Growth rates are expressed in percentages. Index numbers are expressed in basis points or as fractions, whichever is indicated. Ratios are expressed as fractions. The currency of financial values is the Rand.

Numbers representing totals of counts, indices, percentages, ratios, and these per head are given as an unweighted average. The rest of the aggregates are given as sum totals.

Both the direction and rate of change in the reported indicators are important in terms of making inferences about existing and prospective patterns. Just as rates differ, so do levels. The Compendium makes possible the assessment of both.

For space reasons, a balance has to be made with regard to the number of indicators the Compendium contains. If too many indicators were shown, assimilation of the reported information would be compromised. If too few are shown, important information may be omitted and the overall picture of economic activity within and across industries might be biased. It is considered that the reported number of indicators addresses the situation appropriately.

Regarding usage, we encourage feedback about this publication to ensure that it meets user needs. In this regard, we welcome your suggestions and comments. Please refer to the questionnaire and contact details provided at the end of this publication.

1. Introduction

The Compendium of Industrial Statistics is a publication about the economic progress of the industries comprising the South African manufacturing sector. It gives an insight into the national trends characterising this progress.

The choice of economic progress as the primary concept for the publication is not accidental.

Economic progress may be regarded as the process of industry development reflecting the transmission of knowledge and its resultant advances thereof (Lachmann, 1978: 28).

Measuring economic progress as an extension to a regular industrial statistics programme is an important and valuable task that a national statistical agency can take on.

There is an ongoing public interest in the various aspects of economic life that define the existence of industries in terms of productivity, nurtured by innovation from industrial activity as well as by the skills and proficiency of the workforce engaged in these activities. The Compendium of Industrial Statistics provides a rich and digestible selection of objective statistical evidence for the factual assessment of these – by those who formulate and evaluate policy, researchers, and society at large.

The ultimate aim is to deliver an informative snapshot of this progress when making sense of the production, human resources, and competitive conditions in which industries reside. This should facilitate an informed determination about whether these conditions are getting better, and at what rate.

Economic progress is an intricate process and in this regard the Compendium contains a comprehensive array of indicators to aid its study. As part of this the Compendium organises data by three distinct but interrelated classifications, which give meaning to the reported numbers, thereby giving some guideposts by which to monitor this progress.

The classifications gauge knowledge, and particularly its transmission, as the basis for the organisation and conduct of economic activities within and across industries. The technical annex outlines the specifics of each classification. However for the present moment, some brief but detailed non-technical remarks are offered to help clarify their usage.

The first of these classifications, the R&D or innovation-based classification scheme, decomposes industries into R&D intensive and non-R&D intensive industries depending on their technological status. This classification has its origin in the nature of industrial/ production processes, which are implicitly considered in the construction of the International Standard Industrial Classification System of All Economic Activities (ISIC). Here industries are defined in terms of establishments, i.e. firms, primarily engaged in producing a product or group of products that are related by the technical process used in production. It is possible to hypothetically distinguish between whether such a production process or processes tend to remain unchanged, eventually becoming outdated without necessarily inhibiting industries from their existence, or if they are subject to constant change if the industry is to exist at all. Industries in the former category can be classified as non-R&D intensive, whereas industries in the latter category may be designated as R&D intensive.

It is also important to recognise that the evolution of technical processes brings complexity and sophistication to economic activities, which has the effect of transforming the skill requirements of the workforce. Productivity, which denotes output per worker, depends on the amount of capital available per worker. Accordingly exercising control over these technical processes which are inextricably connected with capital accumulation is a matter of knowledge, and specifically of the capability (i.e. skill, and proficiency), and understanding the workforce has in order to master them effectively. In line with this the other two classifications focus on the evolving structure of employment. The first decomposes employment by skill type, and the second decomposes employment by the information or knowledge it may be regarded to possess in directing the production of goods.

Each of the above classifications is relative in character. They enable one to tell if a given industry or industry group is relatively more innovative compared to another, and in the same vein, if a given industry or industry group holds higher skilled, more knowledgeable employees vis-à-vis another.

In a nutshell, the Compendium of Industrial Statistics should serve as an indispensable companion to exploring the economic progress of South Africa's manufacturing industries. It is particularly useful in industry analysis where the objective is to determine how an industry fares in terms of its growth or lack thereof in relation to indicators that may be deemed important in assessing its current status or future potential. The compound annual growth rate is the metric usually deployed for this purpose. The resultant calculations can flag out positive and negative areas associated with the economic situation of the industry.

The section outline of the remainder of the Compendium is as follows:

The **key findings section** gives two examples of the type of industry analysis the Compendium makes possible using the compound annual growth rates for a selection of indicators it contains. The examples look at the two leading industries by output emerging out of their respective R&D and non-R&D intensive segments over the period of coverage. This is the transport equipment industry from the R&D segment and the food products industry from the non-R&D segment. Their illustrative reports suggest possible interpretations of the data irrespective of which industry may otherwise be considered.

The **summary tables section** captures cross-sectional industry details by type of ownership, production, employment, knowledge and skills, productivity, pricing and operational performance.

The **technical annex section** deals with the conceptual methods followed in the assembly of the Compendium.

2. Key findings

2.1 Transport equipment industry

The transport equipment industry contributes on average 14,76% to total manufacturing output and is responsible for 6,92% of total manufacturing employment. The industry comprises the following activities:

- manufacture of motor vehicles;
- manufacture of bodies (coachwork) for motor vehicles;
- manufacture of trailers and semi-trailers;
- manufacture of parts and accessories for motor vehicles and their engines;
- building and repairing of ships and boats;
- manufacture of railway and tramway locomotives and rolling stock;
- manufacture of aircraft and space craft;
- and manufacture of transport equipment not elsewhere classified.

Table A depicts the growth situation of the industry. With regard to production adjusted for inflation, i.e., index of real production; between 2003 and 2007, the industry realised a steady growth rate of 4,92% per annum. During the same period, value added in real terms grew by 4,91% per annum.

The industry is a considerable employer of highly skilled labour. Between 2003 and 2007, employment grew at a compound annual rate of 9,47%. During the same period, the percentage of highly skilled personnel grew faster at 5,11% per annum compared to low skilled personnel whose growth rate was 2,94%.

Notwithstanding the rise in employment, which is coupled to a pursuant increase in compensation, labour productivity in the industry is on a decline, registering an ongoing contraction at an annual rate of 4,16% between 2003 and 2007. By transmission, the industry's capital-labour ratio, capital productivity, and total factor productivity, showed a decline during the same period.

As part of increasing employment opportunities, the recruitment of more labour is attracting higher compensation for services rendered. Remuneration increased, matching the overall growth rate in employment. It appears capital deepening may be

responsible for this outcome, which speaks positively for the future outlook of the industry.

Table A: Transport equipment industry: Growth rates of selected economic indicators: 2003–2007 (percentage)

Indicator	Rate
Real net exports (Rands)	↑ 10,13
Index of real remuneration (2003=100)	↑ 9,68
Employment in numbers (count)	↑ 9,47
Undistributed profit in current prices (R million)	↑ 8,05
Number of firms (count)	↑ 6,88
Index of real capital stock (2003=100)	↑ 5,58
High-skilled employees in total employment (percentage)	↑ 5,11
Index of real production (2003=100)	↑ 4,92
Index of real value added (2003=100)	↑ 4,91
Low-skilled employees in total employment (percentage)	↑ 2,94
Fisher price index (2003=100)	↑ 1,81
Rate of return (percentage)	↑ 0,05
Total factor productivity index (2003=100)	↓ -0,03
Price-marginal cost margin (ratio)	↓ -0,26
Capital productivity index (2003=100)	↓ -0,63
Interest cover (ratio)	↓ -1,01
Low-moderately skilled employees in total employment (percentage)	↓ -2,74
Elasticity of demand (ratio)	↓ -2,95
Capital-labour ratio index (2003=100)	↓ -3,55
Labour productivity index (2003=100)	↓ -4,16
Rosenbluth index (ratio)	↓ -4,75
Moderately-highly skilled employees in total employment (percentage)	↓ -6,44

Inflation-adjusted capital stock increased at a steady annual rate of 5,58% between 2003 and 2007. During the same period undistributed profit increased at a rate of 8,05% per annum. The accumulation of capital in conjunction with improved profit-taking leads to an upward movement in the rates of return from investment. It may also be expected to facilitate an enhancement of labour productivity as the resultant creation and application of knowledge begin to pick up after capital deepening has settled.

As expected, improved profit taking is stimulating greater firm entry in the industry. This grew at a steady annual rate of 6,88% between 2003 and 2007. This may partially contribute to an increased rivalry in the industry. This is reflected in the Rosenbluth index of concentration, falling at an annual rate of 4,75% in the same period.

The industry's competitiveness suggests that its producers are able to maintain such a mix of economies of scale, product differentiation and absolute cost advantages as to enable it to generate a positive growth in real net exports at an annual rate of 10,13%; as was the case between 2003 and 2007. These gains from trade indicate that in real terms, the prices producers get for their exports outperform the prices of imports they encounter.

The important role of imports is also evident. The price pressures they induce filter through in domestic production. In response, the industry experiences a steadily declining price-marginal cost ratio at an annual rate of 0,26% in the period 2003 to 2007. This also appears to be a contributing factor to taming inflationary increases to 1,81% per annum.

2.2 Food products industry

The food products industry contributes 13,24% to total manufacturing output and is responsible for 11,33% of total manufacturing employment. The industry entails these activities:

- manufacture, processing and preservation of meat, fish, fruit, vegetables, oils and fats;
- manufacture of dairy products;
- manufacture of grain mill products, starches, starch products and prepared animal feeds;
- and the manufacture of other food products.

Table B shows the growth situation of the industry.

With regard to production adjusted for inflation, i.e., index of real production, the industry realised a steady annual growth rate of 4,54% between 2003 and 2007. Consequently, during the same period, value added grew in real terms at a steady rate of 4,54% per annum.

The industry is a considerable employer of moderate to highly skilled labour with annual growth in this workforce category reaching 17,59% per annum between 2003 and 2007. This is in spite of a steady decline in total industry employment accompanied by a notable downward fall in employment of low-skilled labour where the compound annual growth rate of job shedding reached 3,13% during the same period. This re-adjustment in skill may lead to an improvement in labour productivity, which appears to be confirmed by a lift-up in the rate of return from investment decisions. Between 2003 and 2007, this rate increased by 0,40% annually.

By transmission, the industry's capital-labour ratio, and total factor productivity also showed a steady rise of 9,03% per annum and 0,02% per annum – respectively - over this period. On the other hand, capital productivity declined at an annual compound rate of 0,43%. This suggests that although newly-recruited staff may be skilled, they may to some extent, be learning the operational proficiency needed to work with capital more effectively, especially at times of capital deepening when new methods of production have to be mastered. The industry seems to be undergoing such a transition without negative consequences to profit taking. For instance,

inflation-adjusted capital stock increased at an annual compound growth rate of 5,00% from 2003 to 2007. During the same period, undistributed profit rose at an annual compound growth rate of 10,93%.

Table B: Food products industry: Growth rates of selected economic indicators: 2003–2007 (percentage)

Indicator	Rate
Moderately-highly skilled employees in total employment (percentage)	↑ 17,59
Elasticity of demand (ratio)	↑ 14,95
Undistributed profit in current prices (R million)	↑ 10,93
Capital-labour ratio index (2003=100)	↑ 9,03
Labour productivity index (2003=100)	↑ 8,56
Index of real capital stock (2003=100)	↑ 5,00
Number of firms (count)	↑ 4,79
Index of real value added (2003=100)	↑ 4,54
Index of real production (2003=100)	↑ 4,54
Fisher price index (2003=100)	↑ 4,22
Low-moderately skilled employees in total employment (percentage)	↑ 2,77
Index of real remuneration (2003=100)	↑ 0,88
Rate of return (percentage)	↑ 0,40
Total factor productivity index (2003=100)	↑ 0,02
Capital productivity index (2003=100)	↓ -0,43
Interest cover (ratio)	↓ -1,09
Low-skilled employees in total employment (percentage)	↓ -3,13
Real net exports (Rands)	↓ -3,47
Employment in numbers (count)	↑ -3,70
Rosenbluth index (ratio)	↓ -5,49
High-skilled employees in total employment (percentage)	↓ -6,54
Price-marginal cost margin (ratio)	↓ -13,90

Improved profit taking stimulates greater firm entry into the industry, which has grown on an annual compound basis at the rate of 4,79%. In response to heightened rivalry, the Rosenbluth index of concentration decreased at a rate of 5,49% annually. An additional factor which may be assisting this decrease is competition from abroad, i.e., foreign trade.

The industry's negative position in real net exports has been steadily lessening at an annual rate of 3,47% between 2003 and 2007. This implies that in real terms the prices that enterprises get for exports although being sub-par to these for imports are gradually improving. This suggests that the industry's mix of economies of scale, product differentiation and absolute cost advantages is beginning to align to the offerings of foreign competitors. Signs of this emerge from the industry's price-marginal cost ratio declining at an annual compound growth rate of 13,90% over the 2003–2007 period. However the inflationary increases depicted by the Fisher price index, which in the same period rose at a compound growth rate of 4,22% per annum seem to indicate that this process is in its infancy.

3. Summary tables

The summary tables show the Compendium indicators on an industry-by-industry basis. The data is sorted by the R&D classification or segment to which each industry belongs. Within each segment, industries are arranged in an increasing order of their respective ISIC code.

Each section heading identifies the indicator reported on, followed by an outline of its contents: -

3.1 Ownership breakdown

Table 1: Proportion of private sector firms in total firms: 2003–2007 (percentage)
Table 2: Proportion of public sector firms in total firms: 2003–2007 (percentage)
Table 3: Proportion of other firms in total firms: 2003–2007 (percentage)

3.2 Production

Table 4: Production in current prices: 2003–2007 (R million)
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Table 15: Moderate-highly skilled employees in total employment: 2003–2007 (percentage)
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Table 17: Low-skilled employees in total employment: 2003–2007 (percentage)

3.5 Employment breakdown by knowledge type

3.6 Productivity

3.7 Pricing behaviour

3.8 Operational performance

3.1 Ownership breakdown

Table 1: Proportion of private sector firms in total firms: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	96,08	96,23	97,14	100,00
Industrial chemicals	99,04	98,91	99,25	98,81	98,90
Other chemicals	100,00	100,00	100,00	98,58	98,44
Petroleum and related products	100,00	100,00	96,77	95,45	97,87
Plastic products	100,00	100,00	100,00	98,04	99,15
Iron and steel	98,72	99,07	97,12	99,11	99,08
Non-ferrous metals	100,00	100,00	100,00	98,25	98,21
Non-electrical machinery	98,23	98,17	99,01	99,17	98,17
Electrical machinery	98,21	98,80	98,25	98,25	99,28
Transport equipment	99,42	97,55	97,38	97,19	99,26
Professional and scientific equipment	98,15	98,11	100,00	96,60	98,25
R&D intensive industries	**99,25**	**98,79**	**98,55**	**97,87**	**98,78**
Food products	97,99	99,14	99,59	98,50	97,14
Beverages	90,00	98,44	97,10	97,06	100,00
Tobacco	100,00	92,31	100,00	92,31	100,00
Textiles	100,00	100,00	100,00	98,66	98,90
Wearing apparel, except footwear	97,37	100,00	98,61	99,15	100,00
Leather and fur products	98,04	98,36	100,00	96,00	100,00
Footwear, except rubber or plastic	100,00	100,00	100,00	100,00	97,44
Wood products, except furniture	100,00	100,00	99,15	96,91	100,00
Furniture and fixtures, excluding metal	96,43	100,00	97,33	99,32	98,77
Paper and products	91,53	93,75	92,86	100,00	100,00
Rubber products	97,75	100,00	99,04	97,67	100,00
Non-metallic mineral products	96,36	96,67	98,55	98,50	97,22
Glass and products	96,24	98,90	96,77	100,00	100,00
Fabricated metal products	99,35	98,80	96,49	96,95	97,31
Other manufacturing industries	100,00	100,00	100,00	97,86	94,78
Non-R&D intensive industries	**97,40**	**98,42**	**98,37**	**97,93**	**98,77**
MANUFACTURING	**98,33**	**98,61**	**98,46**	**97,90**	**98,78**

Table 2: Proportion of public sector firms in total firms: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	0,00	1,96	1,89	0,00	0,00
Industrial chemicals	0,00	0,00	0,00	1,19	1,10
Other chemicals	0,00	0,00	0,00	0,00	0,00
Petroleum and related products	0,00	0,00	0,00	0,00	0,00
Plastic products	0,00	0,00	0,00	1,96	0,85
Iron and steel	0,00	0,00	0,96	0,89	0,92
Non-ferrous metals	0,00	0,00	0,00	0,00	0,00
Non-electrical machinery	1,77	0,00	0,00	0,00	0,00
Electrical machinery	1,34	0,60	0,00	0,58	0,00
Transport equipment	0,00	0,00	0,00	1,05	0,00
Professional and scientific equipment	0,00	0,00	0,00	0,00	0,00
R&D intensive industries	**0,28**	**0,23**	**0,26**	**0,52**	**0,26**
Food products	2,01	0,00	0,00	0,75	1,43
Beverages	2,50	0,00	2,90	1,47	0,00
Tobacco	0,00	0,00	0,00	0,00	0,00
Textiles	0,00	0,00	0,00	0,00	1,10
Wearing apparel, except footwear	0,00	0,00	0,00	0,00	0,00
Leather and fur products	0,00	0,00	0,00	0,00	0,00
Footwear, except rubber or plastic	0,00	0,00	0,00	0,00	2,56
Wood products, except furniture	0,00	0,00	0,00	0,00	0,00
Furniture and fixtures, excluding metal	0,89	0,00	0,00	0,00	0,00
Paper and products	3,39	0,00	0,00	0,00	0,00
Rubber products	2,25	0,00	0,96	2,33	0,00
Non-metallic mineral products	1,82	1,67	0,00	0,00	0,93
Glass and products	1,50	0,00	0,00	0,00	0,00
Fabricated metal products	0,00	0,00	0,58	1,53	0,00
Other manufacturing industries	0,00	0,00	0,00	0,00	0,75
Non-R&D intensive industries	**0,96**	**0,11**	**0,30**	**0,40**	**0,45**
MANUFACTURING	**0,62**	**0,17**	**0,28**	**0,46**	**0,36**

Table 3: Proportion of other firms in total firms: 2003–2007

(percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	0,00	1,96	1,89	2,86	0,00
Industrial chemicals	0,96	1,09	0,75	0,00	0,00
Other chemicals	0,00	0,00	0,00	1,42	1,56
Petroleum and related products	0,00	0,00	3,23	4,55	2,13
Plastic products	0,00	0,00	0,00	0,00	0,00
Iron and steel	1,28	0,93	1,92	0,00	0,00
Non-ferrous metals	0,00	0,00	0,00	1,75	1,79
Non-electrical machinery	0,00	1,83	0,99	0,83	1,83
Electrical machinery	0,45	0,60	1,75	1,17	0,72
Transport equipment	0,58	2,45	2,62	1,75	0,74
Professional and scientific equipment	1,85	1,89	0,00	3,40	1,75
R&D intensive industries	**0,47**	**0,98**	**1,20**	**1,61**	**0,96**
Food products	0,00	0,86	0,41	0,75	1,43
Beverages	7,50	1,56	0,00	1,47	0,00
Tobacco	0,00	7,69	0,00	7,69	0,00
Textiles	0,00	0,00	0,00	1,34	0,00
Wearing apparel, except footwear	2,63	0,00	1,39	0,85	0,00
Leather and fur products	1,96	1,64	0,00	4,00	0,00
Footwear, except rubber or plastic	0,00	0,00	0,00	0,00	0,00
Wood products, except furniture	0,00	0,00	0,85	3,09	0,00
Furniture and fixtures, excluding metal	2,68	0,00	2,67	0,68	1,23
Paper and products	5,08	6,25	7,14	0,00	0,00
Rubber products	0,00	0,00	0,00	0,00	0,00
Non-metallic mineral products	1,82	1,67	1,45	1,50	1,85
Glass and products	2,26	1,10	3,23	0,00	0,00
Fabricated metal products	0,65	1,20	2,92	1,53	2,69
Other manufacturing industries	0,00	0,00	0,00	2,14	4,48
Non-R&D intensive industries	**1,64**	**1,46**	**1,34**	**1,67**	**0,78**
MANUFACTURING	**1,05**	**1,22**	**1,27**	**1,64**	**0,87**

3.2 Production

Table 4: Production in current prices: 2003–2007

(R million)

Industry	2003	2004	2005	2006	2007
Printing and publishing	17 971	19 132	21 369	23 076	27 861
Industrial chemicals	54 415	56 602	59 981	67 476	77 327
Other chemicals	68 139	70 959	74 434	82 614	90 103
Petroleum and related products	64 769	70 543	75 015	84 764	89 331
Plastic products	23 476	24 293	25 455	27 924	30 464
Iron and steel	68 232	74 555	78 476	92 465	109 877
Non-ferrous metals	25 831	26 452	27 843	29 887	36 033
Non-electrical machinery	38 525	41 509	43 692	46 353	53 683
Electrical machinery	33 350	34 876	35 778	39 652	42 138
Transport equipment	126 872	137 340	150 895	165 620	176 436
Professional and scientific equipment	3 927	4 449	4 555	5 512	5 403
R&D intensive industries	**525 506**	**560 710**	**597 493**	**665 342**	**738 656**
Food products	112 539	121 615	129 551	145 377	172 731
Beverages	29 802	34 805	38 145	41 860	44 681
Tobacco	8 825	9 190	10 412	11 880	13 788
Textiles	19 222	18 406	16 980	17 382	19 087
Wearing apparel, except footwear	16 179	15 546	14 416	14 683	15 228
Leather and fur products	4 534	4 547	4 312	4 392	4 356
Footwear, except rubber or plastic	3 606	3 549	3 349	3 427	3 722
Wood products, except furniture	18 461	19 400	20 652	21 981	23 135
Furniture and fixtures, excluding metal	10 884	12 262	12 114	12 902	15 937
Paper and products	39 958	39 637	43 086	45 686	47 946
Rubber products	8 903	9 338	10 001	10 667	9 679
Non-metallic mineral products	19 093	21 554	24 740	26 258	31 835
Glass and products	4 864	5 497	6 201	6 056	7 425
Fabricated metal products	40 895	44 810	48 367	54 523	60 748
Other manufacturing industries	13 407	14 076	14 942	15 634	17 579
Non-R&D intensive industries	**351 172**	**374 231**	**397 267**	**432 708**	**487 876**
MANUFACTURING	**876 678**	**934 941**	**994 760**	**1 098 050**	**1 226 532**

Table 5: Value added in current prices: 2003–2007

(R million)

Industry	2003	2004	2005	2006	2007
Printing and publishing	6 426	6 742	6 724	7 747	8 445
Industrial chemicals	12 394	12 317	13 527	14 700	15 024
Other chemicals	14 614	15 721	17 621	19 759	22 055
Petroleum and related products	15 730	16 947	18 124	19 285	23 935
Plastic products	7 785	8 257	8 721	9 668	11 241
Iron and steel	13 658	14 912	16 393	21 087	27 642
Non-ferrous metals	8 702	9 136	9 870	11 155	12 859
Non-electrical machinery	9 940	10 956	11 952	13 568	16 417
Electrical machinery	8 518	8 539	9 282	10 019	11 129
Transport equipment	20 604	22 225	24 009	25 252	28 640
Professional and scientific equipment	1 125	1 162	1 283	1 667	1 604
R&D intensive industries	**119 497**	**126 914**	**137 505**	**153 908**	**178 993**
Food products	22 147	24 251	26 117	30 290	34 003
Beverages	10 139	11 890	12 971	15 785	17 514
Tobacco	3 155	3 316	3 540	4 164	4 982
Textiles	3 947	4 075	3 802	3 864	4 308
Wearing apparel, except footwear	4 722	4 855	4 601	4 902	5 095
Leather and fur products	692	774	727	755	821
Footwear, except rubber or plastic	898	903	829	869	944
Wood products, except furniture	5 527	5 782	5 862	5 988	6 081
Furniture and fixtures, excluding metal	2 655	3 055	3 089	3 585	3 894
Paper and products	9 499	9 205	9 673	9 972	10 637
Rubber products	2 305	2 420	2 638	2 617	2 583
Non-metallic mineral products	6 330	7 079	7 844	8 540	9 640
Glass and products	1 642	1 839	2 098	2 146	2 568
Fabricated metal products	11 918	13 323	14 621	16 580	20 320
Other manufacturing industries	2 238	2 354	2 573	2 611	2 867
Non-R&D intensive industries	**87 815**	**95 122**	**100 984**	**112 671**	**126 257**
MANUFACTURING	**207 312**	**222 036**	**238 489**	**266 578**	**305 250**

Table 6: Capital stock in current prices: 2003–2007

(R million)

Industry	2003	2004	2005	2006	2007
Printing and publishing	3 151	3 322	3 199	4 607	3 443
Industrial chemicals	14 055	14 103	15 441	16 418	17 181
Other chemicals	13 707	15 124	16 892	19 402	22 352
Petroleum and related products	20 264	21 840	23 309	24 694	30 936
Plastic products	5 333	5 971	6 222	6 983	7 931
Iron and steel	15 505	16 723	18 344	24 307	31 716
Non-ferrous metals	10 785	11 395	12 287	13 933	15 823
Non-electrical machinery	8 217	8 914	9 577	10 982	12 710
Electrical machinery	7 228	7 463	8 119	8 768	9 459
Transport equipment	19 141	20 324	22 593	23 846	27 465
Professional and scientific equipment	1 223	1 264	1 407	1 896	1 745
R&D intensive industries	**118 609**	**126 442**	**137 390**	**155 836**	**180 759**
Food products	22 587	24 334	26 030	30 899	35 436
Beverages	11 849	13 814	14 976	18 393	20 410
Tobacco	3 972	4 149	4 412	5 196	6 337
Textiles	3 480	3 547	3 423	3 611	4 018
Wearing apparel, except footwear	3 040	3 108	2 860	3 477	3 729
Leather and fur products	743	817	770	799	896
Footwear, except rubber or plastic	927	923	848	892	948
Wood products, except furniture	4 363	4 596	4 613	4 625	4 883
Furniture and fixtures, excluding metal	1 978	2 313	2 338	2 961	3 068
Paper and products	10 055	9 774	10 385	10 725	11 756
Rubber products	1 720	1 896	2 015	2 078	2 139
Non-metallic mineral products	7 389	8 295	9 212	9 817	11 292
Glass and products	1 648	1 843	2 038	2 318	2 407
Fabricated metal products	9 958	10 948	11 917	13 736	16 674
Other manufacturing industries	2 327	2 397	2 636	2 567	2 942
Non-R&D intensive industries	**86 037**	**92 753**	**98 475**	**112 093**	**126 936**
MANUFACTURING	**204 646**	**219 195**	**235 865**	**267 929**	**307 695**

Table 7: Index of real production: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	104,80	112,30	109,08	134,60
Industrial chemicals	100,00	97,12	97,14	104,38	102,07
Other chemicals	100,00	100,40	98,41	102,27	104,90
Petroleum and related products	100,00	111,04	106,31	110,13	103,36
Plastic products	100,00	95,31	92,47	92,04	100,46
Iron and steel	100,00	113,30	116,66	120,13	107,43
Non-ferrous metals	100,00	99,18	102,76	106,04	93,85
Non-electrical machinery	100,00	97,92	98,17	98,93	107,19
Electrical machinery	100,00	100,41	99,08	105,73	111,58
Transport equipment	100,00	106,88	116,12	125,92	127,12
Professional and scientific equipment	100,00	116,33	116,41	136,75	128,15
R&D intensive industries	**100,00**	**103,88**	**105,08**	**110,13**	**110,97**
Food products	100,00	106,62	115,68	117,35	124,85
Beverages	100,00	106,72	112,50	113,12	114,21
Tobacco	100,00	90,13	86,72	89,20	92,76
Textiles	100,00	97,43	89,87	85,40	84,83
Wearing apparel, except footwear	100,00	99,15	93,17	93,69	95,19
Leather and fur products	100,00	116,06	117,40	120,31	112,99
Footwear, except rubber or plastic	100,00	101,25	97,11	98,79	104,61
Wood products, except furniture	100,00	105,76	108,45	114,76	113,21
Furniture and fixtures, excluding metal	100,00	108,02	105,28	107,23	125,58
Paper and products	100,00	113,23	137,96	147,76	143,66
Rubber products	100,00	101,53	110,32	122,98	95,95
Non-metallic mineral products	100,00	103,56	109,86	113,89	125,36
Glass and products	100,00	110,76	124,55	114,14	126,50
Fabricated metal products	100,00	103,62	107,21	116,61	114,77
Other manufacturing industries	100,00	108,34	116,24	115,03	119,91
Non-R&D intensive industries	**100,00**	**104,81**	**108,82**	**111,35**	**112,96**
MANUFACTURING	**100,00**	**104,35**	**106,95**	**110,74**	**111,97**

Table 8: Index of real value added: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	103,27	98,82	102,40	114,10
Industrial chemicals	100,00	92,79	96,19	99,84	87,07
Other chemicals	100,00	103,72	108,63	114,05	119,73
Petroleum and related products	100,00	109,84	105,76	103,18	114,03
Plastic products	100,00	97,69	95,53	96,10	111,78
Iron and steel	100,00	113,20	121,74	136,86	135,02
Non-ferrous metals	100,00	101,69	108,13	117,48	99,42
Non-electrical machinery	100,00	100,17	104,08	112,23	127,05
Electrical machinery	100,00	96,25	100,64	104,58	115,37
Transport equipment	100,00	106,50	113,77	118,22	127,07
Professional and scientific equipment	100,00	106,01	114,42	144,31	132,75
R&D intensive industries	**100,00**	**102,83**	**106,15**	**113,57**	**116,67**
Food products	100,00	108,04	118,50	124,25	124,88
Beverages	100,00	107,16	112,44	125,39	131,59
Tobacco	100,00	90,96	82,47	87,45	93,74
Textiles	100,00	105,06	98,01	92,46	93,23
Wearing apparel, except footwear	100,00	106,10	101,89	107,19	109,11
Leather and fur products	100,00	129,35	129,56	135,37	139,52
Footwear, except rubber or plastic	100,00	103,42	96,49	100,61	106,56
Wood products, except furniture	100,00	105,28	102,83	104,43	99,41
Furniture and fixtures, excluding metal	100,00	110,36	110,05	122,17	125,79
Paper and products	100,00	110,61	130,28	135,67	134,06
Rubber products	100,00	101,62	112,37	116,54	98,91
Non-metallic mineral products	100,00	102,60	105,05	111,73	114,50
Glass and products	100,00	109,77	124,81	119,80	129,56
Fabricated metal products	100,00	105,72	111,21	121,68	131,73
Other manufacturing industries	100,00	108,54	119,90	115,07	117,14
Non-R&D intensive industries	**100,00**	**106,97**	**110,39**	**114,65**	**116,65**
MANUFACTURING	**100,00**	**104,90**	**108,27**	**114,11**	**116,66**

Table 9: Index of real capital stock: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	103,78	95,88	124,20	94,87
Industrial chemicals	100,00	93,68	96,82	98,33	87,80
Other chemicals	100,00	106,38	111,02	119,39	129,36
Petroleum and related products	100,00	109,88	105,58	102,55	114,40
Plastic products	100,00	103,13	99,50	101,31	115,12
Iron and steel	100,00	111,83	120,00	138,96	136,47
Non-ferrous metals	100,00	102,32	108,60	118,39	98,70
Non-electrical machinery	100,00	98,59	100,89	109,90	118,99
Electrical machinery	100,00	99,13	103,75	107,87	115,56
Transport equipment	100,00	104,84	115,25	120,17	131,17
Professional and scientific equipment	100,00	106,15	115,51	151,09	132,91
R&D intensive industries	**100,00**	**103,61**	**106,62**	**117,47**	**115,94**
Food products	100,00	106,30	115,80	124,28	127,61
Beverages	100,00	106,53	111,09	125,01	131,21
Tobacco	100,00	90,40	81,65	86,68	94,71
Textiles	100,00	103,70	100,10	98,00	98,63
Wearing apparel, except footwear	100,00	105,49	98,36	118,05	124,04
Leather and fur products	100,00	127,22	128,02	133,63	141,90
Footwear, except rubber or plastic	100,00	102,43	95,71	100,04	103,65
Wood products, except furniture	100,00	106,01	102,48	102,16	101,11
Furniture and fixtures, excluding metal	100,00	112,12	111,78	135,40	133,02
Paper and products	100,00	110,95	132,14	137,85	139,98
Rubber products	100,00	106,70	115,06	123,97	109,74
Non-metallic mineral products	100,00	102,99	105,70	110,02	114,90
Glass and products	100,00	109,58	120,82	128,91	121,01
Fabricated metal products	100,00	103,97	108,49	120,65	129,37
Other manufacturing industries	100,00	106,27	118,15	108,80	115,62
Non-R&D intensive industries	**100,00**	**106,71**	**109,69**	**116,90**	**119,10**
MANUFACTURING	**100,00**	**105,16**	**108,15**	**117,18**	**117,52**

3.3 Employment

Table 10: Employment in numbers: 2003–2007

(count)

Industry	2003	2004	2005	2006	2007
Printing and publishing	61 298	60 601	73 814	69 334	80 098
Industrial chemicals	8 242	9 853	11 176	12 260	12 955
Other chemicals	76 022	69 952	73 243	68 996	51 535
Petroleum and related products	33 378	35 087	39 205	40 130	33 335
Plastic products	51 164	48 179	54 414	47 139	43 438
Iron and steel	89 629	94 064	89 295	94 733	110 129
Non-ferrous metals	28 630	25 968	23 783	25 984	19 409
Non-electrical machinery	65 266	67 097	74 869	62 075	77 785
Electrical machinery	57 278	64 117	65 742	71 671	90 027
Transport equipment	90 184	100 292	120 001	134 143	141 748
Professional and scientific equipment	4 886	5 515	6 625	7 268	7 704
R&D intensive industries	**565 979**	**580 723**	**632 167**	**633 733**	**668 164**
Food products	186 566	223 018	202 241	185 435	154 527
Beverages	56 167	59 986	55 810	60 578	53 307
Tobacco	12 317	11 133	10 252	10 788	8 908
Textiles	90 763	108 496	75 548	94 224	65 641
Wearing apparel, except footwear	199 203	180 051	189 272	180 791	187 508
Leather and fur products	7 946	9 499	6 601	6 959	5 747
Footwear, except rubber or plastic	22 180	20 118	18 462	20 130	16 041
Wood products, except furniture	73 363	75 190	78 255	96 224	87 427
Furniture and fixtures, excluding metal	39 441	47 147	52 481	58 665	56 453
Paper and products	32 766	34 660	43 600	45 409	51 663
Rubber products	21 885	20 095	21 804	21 584	17 395
Non-metallic mineral products	79 880	93 248	93 375	91 274	114 342
Glass and products	19 866	18 019	16 536	20 443	20 093
Fabricated metal products	121 873	124 307	143 081	181 279	179 208
Other manufacturing industries	44 146	52 287	48 174	45 770	69 387
Non-R&D intensive industries	**1 008 362**	**1 077 252**	**1 055 490**	**1 119 552**	**1 087 646**
MANUFACTURING	**1 574 341**	**1 657 975**	**1 687 658**	**1 753 285**	**1 755 811**

Table 11: Remuneration in current prices: 2003–2007

(R million)

Industry	2003	2004	2005	2006	2007
Printing and publishing	5 612	5 901	5 990	6 265	7 564
Industrial chemicals	895	1 178	1 243	1 337	1 767
Other chemicals	8 255	7 880	7 071	6 528	5 883
Petroleum and related products	1 537	1 637	1 848	2 178	1 980
Plastic products	5 286	5 427	5 253	4 460	4 958
Iron and steel	4 783	5 511	6 098	6 840	9 154
Non-ferrous metals	1 660	1 621	1 790	1 930	1 778
Non-electrical machinery	6 731	7 558	8 324	5 873	8 879
Electrical machinery	5 526	5 390	5 834	6 255	8 327
Transport equipment	9 317	11 298	11 585	14 631	16 180
Professional and scientific equipment	505	523	558	608	704
R&D intensive industries	**50 106**	**53 925**	**55 594**	**56 906**	**67 174**
Food products	10 988	12 439	13 582	14 934	14 111
Beverages	3 356	4 010	4 518	5 131	5 034
Tobacco	486	559	627	724	548
Textiles	2 495	2 518	2 358	3 900	2 671
Wearing apparel, except footwear	5 476	4 179	5 908	5 640	5 670
Leather and fur products	296	351	321	330	334
Footwear, except rubber or plastic	826	744	806	833	543
Wood products, except furniture	3 879	4 042	4 133	4 259	4 201
Furniture and fixtures, excluding metal	1 994	2 269	2 292	2 428	2 736
Paper and products	3 385	4 144	4 209	4 296	4 718
Rubber products	1 648	1 669	1 828	1 817	1 446
Non-metallic mineral products	2 975	3 446	4 077	2 847	5 494
Glass and products	818	929	1 116	889	1 289
Fabricated metal products	7 873	8 991	9 891	10 974	13 509
Other manufacturing industries	1 644	1 933	2 104	1 894	2 824
Non-R&D intensive industries	**48 140**	**52 221**	**57 770**	**60 898**	**65 126**
MANUFACTURING	**98 246**	**106 145**	**113 363**	**117 803**	**132 300**

Table 12: Index of real remuneration: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	103,50	100,80	94,84	117,02
Industrial chemicals	100,00	122,87	122,34	125,76	141,80
Other chemicals	100,00	92,03	77,16	66,70	56,53
Petroleum and related products	100,00	108,63	110,39	119,28	96,55
Plastic products	100,00	94,57	84,76	65,29	72,62
Iron and steel	100,00	119,47	129,34	126,79	127,70
Non-ferrous metals	100,00	94,58	102,79	106,55	72,08
Non-electrical machinery	100,00	102,05	107,05	71,74	101,47
Electrical machinery	100,00	93,65	97,49	100,66	133,06
Transport equipment	100,00	119,72	121,41	151,49	158,75
Professional and scientific equipment	100,00	106,44	111,04	117,35	129,80
R&D intensive industries	**100,00**	**105,23**	**105,87**	**104,22**	**109,76**
Food products	100,00	111,69	124,21	123,47	104,45
Beverages	100,00	109,19	118,31	123,13	114,26
Tobacco	100,00	99,55	94,88	98,74	66,99
Textiles	100,00	102,69	96,17	147,61	91,46
Wearing apparel, except footwear	100,00	78,74	112,81	106,33	104,71
Leather and fur products	100,00	137,29	133,75	138,52	132,71
Footwear, except rubber or plastic	100,00	92,59	102,06	104,86	66,60
Wood products, except furniture	100,00	104,85	103,28	105,82	97,82
Furniture and fixtures, excluding metal	100,00	109,10	108,71	110,16	117,68
Paper and products	100,00	139,72	159,09	164,02	166,86
Rubber products	100,00	98,00	108,95	113,16	77,43
Non-metallic mineral products	100,00	106,27	116,19	79,26	138,84
Glass and products	100,00	111,27	133,23	99,61	130,57
Fabricated metal products	100,00	107,99	113,88	121,91	132,56
Other manufacturing industries	100,00	121,30	133,44	113,65	157,06
Non-R&D intensive industries	**100,00**	**108,68**	**117,26**	**116,68**	**113,33**
MANUFACTURING	**100,00**	**106,96**	**111,57**	**110,45**	**111,55**

Table 13: Personnel costs per employee in current prices: 2003–2007
(Rands)

Industry	2003	2004	2005	2006	2007
Printing and publishing	91 552	97 371	81 144	90 364	94 438
Industrial chemicals	108 592	119 549	111 184	109 074	136 397
Other chemicals	108 592	112 648	96 541	94 609	114 146
Petroleum and related products	46 038	46 665	47 140	54 275	59 393
Plastic products	103 307	112 648	96 541	94 609	114 146
Iron and steel	53 359	58 585	68 292	72 207	83 122
Non-ferrous metals	57 978	62 422	75 252	74 273	91 632
Non-electrical machinery	103 133	112 648	111 184	94 609	114 146
Electrical machinery	96 481	84 070	88 734	87 278	92 495
Transport equipment	103 307	112 648	96 541	109 074	114 146
Professional and scientific equipment	103 307	94 895	84 296	83 651	91 315
R&D intensive industries	**88 695**	**92 195**	**86 986**	**87 638**	**100 489**
Food products	58 897	55 775	67 160	80 537	91 315
Beverages	59 754	66 854	80 948	84 703	94 438
Tobacco	39 444	50 195	61 171	67 112	61 542
Textiles	27 490	23 209	31 216	41 388	40 695
Wearing apparel, except footwear	27 490	23 209	31 216	31 195	30 238
Leather and fur products	37 243	36 960	48 569	47 418	58 107
Footwear, except rubber or plastic	37 243	36 960	43 665	41 388	33 839
Wood products, except furniture	52 878	53 753	52 811	44 264	48 046
Furniture and fixtures, excluding metal	50 552	48 117	43 665	41 388	48 464
Paper and products	103 307	119 549	96 541	94 609	91 315
Rubber products	75 316	83 039	83 851	84 182	83 122
Non-metallic mineral products	37 243	36 960	43 665	31 195	48 046
Glass and products	41 186	51 551	67 478	43 488	64 159
Fabricated metal products	64 601	72 325	69 128	60 539	75 381
Other manufacturing industries	37 243	36 960	43 665	41 388	40 695
Non-R&D intensive industries	**49 992**	**53 028**	**57 650**	**55 653**	**60 627**
MANUFACTURING	**69 344**	**72 612**	**72 318**	**71 646**	**80 558**

3.4 Employment breakdown by skills type

Table 14: High-skilled employees in total employment: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	14,80	14,86	16,59	15,61	25,28
Industrial chemicals	25,10	25,25	35,50	22,90	24,05
Other chemicals	22,84	32,19	15,99	13,09	11,54
Petroleum and related products	19,38	29,21	11,78	13,35	16,52
Plastic products	19,47	13,17	4,69	3,89	10,68
Iron and steel	7,30	12,36	9,95	11,56	8,12
Non-ferrous metals	11,00	16,09	8,52	12,07	0,00
Non-electrical machinery	16,49	19,95	18,63	17,74	21,38
Electrical machinery	18,69	10,24	6,22	11,14	29,41
Transport equipment	10,28	10,22	13,93	16,26	13,18
Professional and scientific equipment	9,31	20,11	11,01	5,95	13,24
R&D intensive industries	**15,88**	**18,51**	**13,89**	**13,05**	**15,76**
Food products	8,33	8,49	8,09	9,13	5,94
Beverages	7,55	4,73	8,02	12,28	5,55
Tobacco	34,03	28,26	32,25	11,39	39,75
Textiles	3,72	4,52	6,86	2,89	5,89
Wearing apparel, except footwear	5,14	2,28	3,62	2,21	4,75
Leather and fur products	0,00	2,19	0,40	0,00	0,00
Footwear, except rubber or plastic	6,52	8,43	0,00	0,00	6,24
Wood products, except furniture	2,21	8,54	3,65	4,45	6,25
Furniture and fixtures, excluding metal	11,87	7,83	4,20	7,05	4,93
Paper and products	14,76	7,92	7,78	9,86	18,51
Rubber products	20,58	16,87	17,81	16,26	8,54
Non-metallic mineral products	7,39	8,89	10,99	5,59	11,71
Glass and products	29,29	6,97	18,59	14,59	0,57
Fabricated metal products	6,36	8,84	5,01	11,24	9,94
Other manufacturing industries	5,60	11,54	5,93	6,42	2,73
Non-R&D intensive industries	**10,89**	**9,09**	**8,88**	**7,56**	**8,75**
MANUFACTURING	**13,38**	**13,80**	**11,39**	**10,31**	**12,26**

Table 15: Moderate-highly skilled employees in total employment: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	5,37	5,26	9,51	11,76	12,44
Industrial chemicals	11,59	12,41	15,27	8,66	21,77
Other chemicals	9,55	16,15	11,95	13,99	8,82
Petroleum and related products	11,31	15,92	13,80	19,96	12,41
Plastic products	5,24	3,15	5,57	8,25	7,34
Iron and steel	8,96	8,54	5,14	6,27	3,76
Non-ferrous metals	6,88	8,00	11,45	11,68	6,49
Non-electrical machinery	22,20	15,17	9,13	16,03	11,79
Electrical machinery	15,10	11,50	12,33	9,50	7,48
Transport equipment	11,52	9,82	8,44	7,41	8,26
Professional and scientific equipment	11,19	30,08	20,10	12,36	23,42
R&D intensive industries	**10,81**	**12,36**	**11,15**	**11,44**	**11,27**
Food products	4,21	5,95	6,00	8,16	9,46
Beverages	13,38	10,57	7,83	5,51	4,92
Tobacco	43,66	28,28	18,69	0,00	0,00
Textiles	5,96	5,50	6,65	2,20	4,12
Wearing apparel, except footwear	7,01	2,92	4,87	3,91	4,65
Leather and fur products	24,79	3,20	3,38	11,53	0,00
Footwear, except rubber or plastic	1,78	4,93	4,29	4,53	3,83
Wood products, except furniture	2,49	4,42	5,92	4,50	6,47
Furniture and fixtures, excluding metal	13,12	3,79	2,06	0,85	3,89
Paper and products	2,02	6,93	2,87	3,72	7,66
Rubber products	7,41	11,32	8,32	11,24	12,48
Non-metallic mineral products	3,74	3,33	6,22	2,43	2,00
Glass and products	12,90	5,29	3,59	4,43	13,98
Fabricated metal products	6,07	5,82	4,48	7,04	4,56
Other manufacturing industries	10,35	7,44	5,13	8,03	4,05
Non-R&D intensive industries	**10,59**	**7,31**	**6,02**	**5,21**	**5,47**
MANUFACTURING	**10,70**	**9,84**	**8,59**	**8,32**	**8,37**

Table 16: Low-moderately skilled employees in total employment: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	45,66	40,94	44,01	29,67	25,02
Industrial chemicals	44,45	40,24	26,66	41,40	30,11
Other chemicals	45,68	32,50	46,43	47,16	55,05
Petroleum and related products	48,82	29,83	31,90	43,64	40,79
Plastic products	48,39	46,72	63,04	56,82	49,87
Iron and steel	47,87	43,46	42,12	42,64	38,82
Non-ferrous metals	42,64	35,58	47,91	41,56	67,14
Non-electrical machinery	31,53	37,60	33,27	31,14	38,62
Electrical machinery	35,09	37,63	36,77	39,68	29,50
Transport equipment	39,03	44,72	40,97	36,20	33,97
Professional and scientific equipment	44,37	37,77	21,51	39,80	21,94
R&D intensive industries	**43,05**	**38,82**	**39,51**	**40,88**	**39,17**
Food products	33,90	36,72	36,02	34,28	38,86
Beverages	55,07	61,15	65,71	62,48	67,96
Tobacco	10,34	19,38	9,76	18,57	51,68
Textiles	52,24	41,05	29,94	37,47	37,29
Wearing apparel, except footwear	43,21	38,64	30,51	32,47	37,56
Leather and fur products	25,43	37,63	28,78	44,58	54,35
Footwear, except rubber or plastic	37,52	43,27	36,67	22,38	50,20
Wood products, except furniture	22,09	26,59	25,07	19,19	20,84
Furniture and fixtures, excluding metal	25,74	27,50	18,61	18,52	26,52
Paper and products	54,31	54,64	57,38	54,02	45,81
Rubber products	51,61	48,92	49,98	49,88	44,36
Non-metallic mineral products	28,36	20,82	23,20	25,31	21,94
Glass and products	22,82	29,13	29,72	41,52	43,60
Fabricated metal products	27,69	19,91	25,65	26,39	26,85
Other manufacturing industries	24,91	31,74	19,96	22,36	30,13
Non-R&D intensive industries	**34,35**	**35,81**	**32,46**	**33,96**	**39,86**
MANUFACTURING	**38,70**	**37,31**	**35,99**	**37,42**	**39,51**

Table 17: Low-skilled employees in total employment: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	34,17	38,94	29,89	42,95	37,25
Industrial chemicals	18,86	22,10	22,58	27,04	24,07
Other chemicals	21,93	19,06	25,63	25,76	24,59
Petroleum and related products	20,48	25,04	42,03	23,04	30,28
Plastic products	23,66	36,85	26,70	31,03	32,12
Iron and steel	35,87	35,36	42,65	39,53	49,30
Non-ferrous metals	39,48	40,34	32,13	34,69	26,37
Non-electrical machinery	29,41	27,28	38,97	35,09	28,21
Electrical machinery	30,66	40,62	44,68	39,68	33,61
Transport equipment	38,55	35,03	36,66	40,12	44,56
Professional and scientific equipment	35,13	12,04	47,37	41,88	41,40
R&D intensive industries	**29,84**	**30,24**	**35,39**	**34,62**	**33,80**
Food products	53,56	48,79	49,90	48,36	45,69
Beverages	24,01	23,55	18,44	19,73	21,57
Tobacco	11,98	24,08	39,30	70,04	8,57
Textiles	38,08	48,93	56,55	57,44	52,70
Wearing apparel, except footwear	44,64	56,02	61,01	61,41	53,03
Leather and fur products	49,78	56,87	67,43	43,89	45,65
Footwear, except rubber or plastic	54,18	43,36	59,04	72,38	39,73
Wood products, except furniture	73,21	60,46	65,35	71,85	66,44
Furniture and fixtures, excluding metal	43,69	60,43	75,12	73,57	64,66
Paper and products	28,90	30,51	31,48	32,39	28,03
Rubber products	20,40	22,89	23,89	22,62	34,62
Non-metallic mineral products	60,28	65,82	59,59	66,68	64,35
Glass and products	34,98	58,61	48,09	39,45	41,86
Fabricated metal products	59,88	65,43	64,87	55,33	58,65
Other manufacturing industries	58,63	49,28	68,98	63,19	63,09
Non-R&D intensive industries	**43,75**	**47,67**	**52,60**	**53,22**	**45,91**
MANUFACTURING	**36,79**	**38,96**	**44,00**	**43,92**	**39,85**

Table 18: Other employees in total employment: 2003–2007

(percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	0,00	0,00	0,00	0,00	0,00
Industrial chemicals	0,00	0,00	0,00	0,00	0,00
Other chemicals	0,00	0,10	0,00	0,00	0,00
Petroleum and related products	0,00	0,00	0,49	0,00	0,00
Plastic products	3,24	0,11	0,00	0,00	0,00
Iron and steel	0,00	0,27	0,14	0,00	0,00
Non-ferrous metals	0,00	0,00	0,00	0,00	0,00
Non-electrical machinery	0,37	0,00	0,00	0,00	0,00
Electrical machinery	0,47	0,00	0,00	0,00	0,00
Transport equipment	0,63	0,20	0,00	0,00	0,04
Professional and scientific equipment	0,00	0,00	0,00	0,00	0,00
R&D intensive industries	**0,43**	**0,06**	**0,06**	**0,00**	**0,00**
Food products	0,00	0,05	0,00	0,07	0,05
Beverages	0,00	0,00	0,00	0,00	0,00
Tobacco	0,00	0,00	0,00	0,00	0,00
Textiles	0,00	0,00	0,00	0,00	0,00
Wearing apparel, except footwear	0,00	0,13	0,00	0,00	0,00
Leather and fur products	0,00	0,12	0,00	0,00	0,00
Footwear, except rubber or plastic	0,00	0,00	0,00	0,70	0,00
Wood products, except furniture	0,00	0,00	0,00	0,00	0,00
Furniture and fixtures, excluding metal	5,58	0,45	0,00	0,00	0,00
Paper and products	0,00	0,00	0,49	0,00	0,00
Rubber products	0,00	0,00	0,00	0,00	0,00
Non-metallic mineral products	0,24	1,15	0,00	0,00	0,00
Glass and products	0,00	0,00	0,00	0,00	0,00
Fabricated metal products	0,00	0,00	0,00	0,00	0,00
Other manufacturing industries	0,51	0,00	0,00	0,00	0,00
Non-R&D intensive industries	**0,42**	**0,13**	**0,03**	**0,05**	**0,00**
MANUFACTURING	**0,42**	**0,09**	**0,04**	**0,03**	**0,00**

3.5 Employment breakdown by knowledge type

Table 19: Information type employees in total employment: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	39,92	36,22	41,39	39,74	43,41
Industrial chemicals	44,86	45,44	56,60	39,68	53,02
Other chemicals	48,46	63,03	46,82	38,94	38,60
Petroleum and related products	36,67	59,82	30,32	41,50	37,39
Plastic products	36,51	23,14	13,22	17,86	25,78
Iron and steel	24,64	29,52	19,89	26,78	16,53
Non-ferrous metals	24,34	30,71	27,48	33,56	21,12
Non-electrical machinery	54,43	51,57	41,95	43,69	43,17
Electrical machinery	45,01	32,21	34,86	36,96	45,38
Transport equipment	33,06	31,29	32,27	33,06	29,08
Professional and scientific equipment	40,33	54,55	34,51	51,36	45,64
R&D intensive industries	**38,93**	**41,59**	**34,48**	**36,65**	**36,28**
Food products	22,22	22,43	22,17	24,01	24,05
Beverages	26,52	24,38	24,50	24,75	20,21
Tobacco	78,38	55,67	50,95	11,39	80,34
Textiles	15,48	14,74	17,36	9,73	18,86
Wearing apparel, except footwear	14,89	6,89	9,90	7,79	11,95
Leather and fur products	29,17	7,89	10,00	14,79	13,11
Footwear, except rubber or plastic	16,84	14,89	6,65	4,53	11,39
Wood products, except furniture	6,90	13,97	9,72	9,97	15,68
Furniture and fixtures, excluding metal	28,13	16,18	10,10	12,11	15,31
Paper and products	22,60	27,35	21,77	28,96	43,08
Rubber products	41,27	36,00	38,26	34,88	23,44
Non-metallic mineral products	15,13	14,97	21,81	15,89	16,64
Glass and products	48,86	12,26	33,99	41,74	20,51
Fabricated metal products	18,74	19,32	14,27	23,14	18,88
Other manufacturing industries	26,47	30,00	16,82	19,94	9,92
Non-R&D intensive industries	**27,44**	**21,13**	**20,55**	**18,91**	**22,89**
MANUFACTURING	**33,19**	**31,36**	**27,52**	**27,78**	**29,59**

Table 20: Non-information type employees in total employment: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	60,08	63,78	58,61	60,26	56,59
Industrial chemicals	55,14	54,56	43,40	60,32	46,98
Other chemicals	51,54	36,87	53,18	61,06	61,40
Petroleum and related products	63,33	40,18	69,20	58,50	62,61
Plastic products	60,26	76,75	86,78	82,14	74,22
Iron and steel	75,36	70,21	79,97	73,22	83,47
Non-ferrous metals	75,66	69,29	72,52	66,44	78,88
Non-electrical machinery	45,20	48,43	58,05	56,31	56,83
Electrical machinery	54,52	67,79	65,14	63,04	54,62
Transport equipment	66,31	68,51	67,73	66,94	70,88
Professional and scientific equipment	59,67	45,45	65,49	48,64	54,36
R&D intensive industries	**60,64**	**58,35**	**65,46**	**63,35**	**63,71**
Food products	77,78	77,52	77,83	75,92	75,90
Beverages	73,48	75,62	75,50	75,25	79,79
Tobacco	21,62	44,33	49,05	88,61	19,66
Textiles	84,52	85,26	82,64	90,27	81,14
Wearing apparel, except footwear	85,11	92,98	90,10	92,21	88,05
Leather and fur products	70,83	91,99	90,00	85,21	86,89
Footwear, except rubber or plastic	83,16	85,11	93,35	94,76	88,61
Wood products, except furniture	93,10	86,03	90,28	90,03	84,32
Furniture and fixtures, excluding metal	66,30	83,37	89,90	87,89	84,69
Paper and products	77,40	72,65	77,74	71,04	56,92
Rubber products	58,73	64,00	61,74	65,12	76,56
Non-metallic mineral products	84,63	83,89	78,19	84,11	83,36
Glass and products	51,14	87,74	66,01	58,26	79,49
Fabricated metal products	81,26	80,68	85,73	76,86	81,12
Other manufacturing industries	73,02	70,00	83,18	80,06	90,08
Non-R&D intensive industries	**72,14**	**78,74**	**79,42**	**81,04**	**77,11**
MANUFACTURING	**66,39**	**68,55**	**72,44**	**72,20**	**70,41**

Table 21: Knowledge employees in total employment: 2003–2007 (percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	14,80	14,86	16,59	15,61	25,28
Industrial chemicals	25,10	25,25	35,50	22,90	24,05
Other chemicals	22,84	32,19	15,99	13,09	11,54
Petroleum and related products	19,38	29,21	11,78	13,35	16,52
Plastic products	19,47	13,17	4,69	3,89	10,68
Iron and steel	7,30	12,36	9,95	11,56	8,12
Non-ferrous metals	11,00	16,09	8,52	12,07	0,00
Non-electrical machinery	16,49	19,95	18,63	17,74	21,38
Electrical machinery	18,69	10,24	6,22	11,14	29,41
Transport equipment	10,28	10,22	13,93	16,26	13,19
Professional and scientific equipment	9,31	20,11	11,01	5,95	13,24
R&D intensive industries	**15,88**	**18,51**	**13,89**	**13,05**	**15,76**
Food products	8,33	8,49	8,09	9,13	5,94
Beverages	7,55	4,73	8,02	12,28	5,55
Tobacco	34,03	28,26	32,25	11,39	39,75
Textiles	3,72	4,52	6,86	2,89	5,89
Wearing apparel, except footwear	5,14	2,28	3,62	2,21	4,75
Leather and fur products	0,00	2,19	0,40	0,00	0,00
Footwear, except rubber or plastic	6,52	8,43	0,00	0,00	6,24
Wood products, except furniture	2,21	8,54	3,65	4,45	6,25
Furniture and fixtures, excluding metal	11,87	7,83	4,20	7,05	4,93
Paper and products	14,76	7,92	7,78	9,86	18,51
Rubber products	20,58	16,87	17,81	16,26	8,54
Non-metallic mineral products	7,39	8,89	10,99	5,59	11,71
Glass and products	29,29	6,97	18,59	14,59	0,57
Fabricated metal products	6,36	8,84	5,01	11,24	9,94
Other manufacturing industries	5,60	11,54	5,93	6,42	2,73
Non-R&D intensive industries	**10,89**	**9,09**	**8,88**	**7,56**	**8,75**
MANUFACTURING	**13,38**	**13,80**	**11,39**	**10,31**	**12,26**

Table 22: Data employees in total employment: 2003–2007

(percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	25,12	21,36	24,80	24,13	18,13
Industrial chemicals	19,76	20,19	21,11	16,78	28,97
Other chemicals	25,63	30,84	30,82	25,85	27,07
Petroleum and related products	17,29	30,61	18,54	28,14	20,87
Plastic products	17,03	9,97	8,53	13,97	15,10
Iron and steel	17,34	17,16	9,94	15,21	8,41
Non-ferrous metals	13,34	14,62	18,95	21,49	21,12
Non-electrical machinery	37,94	31,62	23,32	25,96	21,78
Electrical machinery	26,32	21,97	28,64	25,82	15,96
Transport equipment	22,79	21,07	18,34	16,80	15,90
Professional and scientific equipment	31,02	34,45	23,49	45,40	32,40
R&D intensive industries	**23,05**	**23,08**	**20,59**	**23,60**	**20,52**
Food products	13,89	13,94	14,09	14,88	18,12
Beverages	18,97	19,65	16,48	12,46	14,66
Tobacco	44,35	27,41	18,69	0,00	40,60
Textiles	11,76	10,21	10,50	6,84	12,97
Wearing apparel, except footwear	9,75	4,61	6,28	5,57	7,20
Leather and fur products	29,17	5,70	9,60	14,79	13,11
Footwear, except rubber or plastic	10,32	6,46	6,65	4,53	5,14
Wood products, except furniture	4,69	5,44	6,07	5,51	9,43
Furniture and fixtures, excluding metal	16,26	8,35	5,90	5,06	10,38
Paper and products	7,84	19,43	14,00	19,09	24,58
Rubber products	20,69	19,13	20,45	18,62	14,90
Non-metallic mineral products	7,75	6,08	10,82	10,30	4,93
Glass and products	19,57	5,29	15,40	27,14	19,94
Fabricated metal products	12,38	10,48	9,26	11,90	8,95
Other manufacturing industries	20,87	18,46	10,89	13,51	7,19
Non-R&D intensive industries	**16,55**	**12,04**	**11,67**	**11,35**	**14,14**
MANUFACTURING	**19,80**	**17,56**	**16,13**	**17,47**	**17,33**

Table 23: Goods employees in total employment: 2003–2007

(percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	23,86	23,68	27,73	15,74	19,11
Industrial chemicals	32,06	27,19	20,47	23,55	22,91
Other chemicals	28,47	11,39	25,79	28,90	32,43
Petroleum and related products	42,34	13,23	24,10	34,78	26,82
Plastic products	35,09	36,33	54,93	50,92	40,82
Iron and steel	38,71	33,83	36,42	31,42	33,37
Non-ferrous metals	36,18	24,90	36,22	31,75	45,95
Non-electrical machinery	13,28	19,86	17,91	20,71	27,04
Electrical machinery	20,18	24,62	17,92	20,10	17,49
Transport equipment	24,72	31,40	27,86	21,73	23,86
Professional and scientific equipment	15,32	28,85	15,84	3,89	12,96
R&D intensive industries	**28,20**	**25,03**	**27,74**	**25,77**	**27,52**
Food products	21,04	25,37	25,52	25,09	25,05
Beverages	23,86	20,52	21,03	27,72	32,34
Tobacco	7,03	16,14	9,76	18,57	11,09
Textiles	45,97	35,39	25,70	32,25	27,44
Wearing apparel, except footwear	39,11	35,74	28,44	29,65	32,34
Leather and fur products	21,05	34,04	22,57	41,32	41,24
Footwear, except rubber or plastic	28,14	37,29	33,81	22,38	48,25
Wood products, except furniture	19,08	24,31	23,87	17,78	16,79
Furniture and fixtures, excluding metal	17,03	12,37	12,69	12,68	19,46
Paper and products	47,03	41,09	44,46	37,42	27,20
Rubber products	37,45	35,93	34,52	40,22	41,93
Non-metallic mineral products	23,36	16,07	17,12	16,93	17,99
Glass and products	16,16	27,77	17,92	18,81	35,71
Fabricated metal products	20,07	14,68	19,20	20,26	21,23
Other manufacturing industries	12,54	15,45	13,93	12,66	12,39
Non-R&D intensive industries	**25,26**	**26,14**	**23,37**	**24,92**	**27,36**
MANUFACTURING	**26,73**	**25,58**	**25,56**	**25,35**	**27,44**

Table 24: Services employees in total employment: 2003–2007

(percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	36,22	40,10	30,88	44,52	37,48
Industrial chemicals	23,08	27,36	22,93	36,76	24,07
Other chemicals	23,07	25,48	27,39	32,16	28,96
Petroleum and related products	20,99	26,95	45,10	23,72	35,79
Plastic products	25,17	40,42	31,86	31,22	33,40
Iron and steel	36,65	36,38	43,56	41,80	50,10
Non-ferrous metals	39,48	44,40	36,30	34,69	32,94
Non-electrical machinery	31,92	28,57	40,14	35,59	29,79
Electrical machinery	34,34	43,17	47,23	42,94	37,14
Transport equipment	41,59	37,11	39,87	45,21	47,05
Professional and scientific equipment	44,35	16,59	49,66	44,76	41,40
R&D intensive industries	**32,44**	**33,32**	**37,72**	**37,58**	**36,19**
Food products	56,74	52,15	52,31	50,83	50,88
Beverages	49,62	55,10	54,47	47,54	47,44
Tobacco	14,59	28,20	39,30	70,04	8,57
Textiles	38,55	49,88	56,94	58,02	53,70
Wearing apparel, except footwear	46,00	57,24	61,66	62,56	55,71
Leather and fur products	49,78	57,95	67,43	43,89	45,65
Footwear, except rubber or plastic	55,02	47,82	59,54	72,38	40,36
Wood products, except furniture	74,02	61,71	66,42	72,25	67,53
Furniture and fixtures, excluding metal	49,26	71,00	77,20	75,21	65,23
Paper and products	30,37	31,56	33,28	33,62	29,72
Rubber products	21,28	28,08	27,22	24,90	34,62
Non-metallic mineral products	61,26	67,82	61,07	67,18	65,37
Glass and products	34,98	59,97	48,09	39,45	43,78
Fabricated metal products	61,20	65,99	66,54	56,60	59,88
Other manufacturing industries	60,49	54,55	69,25	67,40	77,69
Non-R&D intensive industries	**46,88**	**52,60**	**56,05**	**56,12**	**49,74**
MANUFACTURING	**39,66**	**42,96**	**46,88**	**46,85**	**42,97**

Table 25: Other employees in total employment: 2003–2007

(percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	0,00	0,00	0,00	0,00	0,00
Industrial chemicals	0,00	0,00	0,00	0,00	0,00
Other chemicals	0,00	0,10	0,00	0,00	0,00
Petroleum and related products	0,00	0,00	0,49	0,00	0,00
Plastic products	3,24	0,11	0,00	0,00	0,00
Iron and steel	0,00	0,27	0,14	0,00	0,00
Non-ferrous metals	0,00	0,00	0,00	0,00	0,00
Non-electrical machinery	0,37	0,00	0,00	0,00	0,00
Electrical machinery	0,47	0,00	0,00	0,00	0,00
Transport equipment	0,63	0,20	0,00	0,00	0,04
Professional and scientific equipment	0,00	0,00	0,00	0,00	0,00
R&D intensive industries	**0,43**	**0,06**	**0,06**	**0,00**	**0,00**
Food products	0,00	0,05	0,00	0,07	0,05
Beverages	0,00	0,00	0,00	0,00	0,00
Tobacco	0,00	0,00	0,00	0,00	0,00
Textiles	0,00	0,00	0,00	0,00	0,00
Wearing apparel, except footwear	0,00	0,13	0,00	0,00	0,00
Leather and fur products	0,00	0,12	0,00	0,00	0,00
Footwear, except rubber or plastic	0,00	0,00	0,00	0,70	0,00
Wood products, except furniture	0,00	0,00	0,00	0,00	0,00
Furniture and fixtures, excluding metal	5,58	0,45	0,00	0,00	0,00
Paper and products	0,00	0,00	0,49	0,00	0,00
Rubber products	0,00	0,00	0,00	0,00	0,00
Non-metallic mineral products	0,24	1,15	0,00	0,00	0,00
Glass and products	0,00	0,00	0,00	0,00	0,00
Fabricated metal products	0,00	0,00	0,00	0,00	0,00
Other manufacturing industries	0,51	0,00	0,00	0,00	0,00
Non-R&D intensive industries	**0,42**	**0,13**	**0,03**	**0,05**	**0,00**
MANUFACTURING	**0,42**	**0,09**	**0,04**	**0,03**	**0,00**

3.6 Productivity

Table 26: Labour productivity index: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	104,46	82,06	90,53	87,32
Industrial chemicals	100,00	77,62	70,94	67,12	55,40
Other chemicals	100,00	112,72	112,75	125,66	176,61
Petroleum and related products	100,00	104,49	90,04	85,82	114,17
Plastic products	100,00	103,74	89,82	104,30	131,66
Iron and steel	100,00	107,86	122,20	129,49	109,89
Non-ferrous metals	100,00	112,11	130,16	129,45	146,65
Non-electrical machinery	100,00	97,43	90,73	118,00	106,60
Electrical machinery	100,00	85,98	87,68	83,58	73,40
Transport equipment	100,00	95,76	85,50	79,48	80,84
Professional and scientific equipment	100,00	93,92	84,38	97,01	84,19
R&D intensive industries	**100,00**	**99,65**	**95,12**	**100,95**	**106,07**
Food products	100,00	90,38	109,31	125,00	150,78
Beverages	100,00	100,34	113,16	116,26	138,65
Tobacco	100,00	100,64	99,08	99,85	129,61
Textiles	100,00	87,89	117,75	89,06	128,92
Wearing apparel, except footwear	100,00	117,39	107,23	118,10	115,91
Leather and fur products	100,00	108,21	155,97	154,57	192,92
Footwear, except rubber or plastic	100,00	114,02	115,92	110,86	147,34
Wood products, except furniture	100,00	102,72	96,40	79,62	83,42
Furniture and fixtures, excluding metal	100,00	92,32	82,70	82,14	87,88
Paper and products	100,00	104,57	97,91	97,89	85,03
Rubber products	100,00	110,67	112,79	118,17	124,43
Non-metallic mineral products	100,00	87,89	89,87	97,78	79,99
Glass and products	100,00	121,02	149,95	116,42	128,10
Fabricated metal products	100,00	103,65	94,73	81,81	89,58
Other manufacturing industries	100,00	91,64	109,88	110,99	74,53
Non-R&D intensive industries	**100,00**	**102,22**	**110,18**	**106,57**	**117,14**
MANUFACTURING	**100,00**	**100,93**	**102,65**	**103,76**	**111,60**

Table 27: Capital productivity index: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	99,51	103,06	82,45	120,27
Industrial chemicals	100,00	99,05	99,35	101,53	99,17
Other chemicals	100,00	97,50	97,85	95,52	92,55
Petroleum and related products	100,00	99,96	100,17	100,61	99,67
Plastic products	100,00	94,73	96,01	94,85	97,10
Iron and steel	100,00	101,23	101,45	98,49	98,94
Non-ferrous metals	100,00	99,38	99,56	99,23	100,73
Non-electrical machinery	100,00	101,60	103,16	102,13	106,77
Electrical machinery	100,00	97,09	97,00	96,95	99,84
Transport equipment	100,00	101,58	98,72	98,37	96,87
Professional and scientific equipment	100,00	99,87	99,06	95,51	99,88
R&D intensive industries	**100,00**	**99,23**	**99,58**	**96,88**	**101,07**
Food products	100,00	101,63	102,33	99,98	97,86
Beverages	100,00	100,59	101,22	100,30	100,29
Tobacco	100,00	100,62	101,01	100,89	98,97
Textiles	100,00	101,31	97,91	94,34	94,53
Wearing apparel, except footwear	100,00	100,59	103,59	90,79	87,96
Leather and fur products	100,00	101,68	101,21	101,31	98,33
Footwear, except rubber or plastic	100,00	100,97	100,82	100,57	102,80
Wood products, except furniture	100,00	99,31	100,34	102,22	98,32
Furniture and fixtures, excluding metal	100,00	98,43	98,45	90,23	94,56
Paper and products	100,00	99,69	98,60	98,42	95,78
Rubber products	100,00	95,24	97,67	94,01	90,13
Non-metallic mineral products	100,00	99,62	99,39	101,56	99,65
Glass and products	100,00	100,18	103,30	92,93	107,07
Fabricated metal products	100,00	101,68	102,51	100,85	101,83
Other manufacturing industries	100,00	102,13	101,48	105,76	101,31
Non-R&D intensive industries	**100,00**	**100,25**	**100,66**	**98,28**	**97,96**
MANUFACTURING	**100,00**	**99,74**	**100,12**	**97,58**	**99,52**

Table 28: Total factor productivity index: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	98,57	89,15	93,43	87,72
Industrial chemicals	100,00	95,95	99,14	96,03	86,59
Other chemicals	100,00	102,86	109,22	110,26	112,50
Petroleum and related products	100,00	99,02	99,48	94,05	109,41
Plastic products	100,00	101,57	102,49	103,38	109,41
Iron and steel	100,00	99,82	103,84	112,73	123,07
Non-ferrous metals	100,00	102,37	104,66	109,59	104,94
Non-electrical machinery	100,00	102,03	105,44	112,01	116,86
Electrical machinery	100,00	96,14	101,25	98,99	103,11
Transport equipment	100,00	100,00	98,21	94,23	99,85
Professional and scientific equipment	100,00	92,15	98,58	105,65	103,33
R&D intensive industries	**100,00**	**99,13**	**101,04**	**102,76**	**105,16**
Food products	100,00	101,19	102,19	105,36	100,11
Beverages	100,00	100,37	99,87	109,45	112,98
Tobacco	100,00	100,59	95,40	98,02	101,23
Textiles	100,00	107,58	107,97	106,55	108,03
Wearing apparel, except footwear	100,00	106,04	108,62	111,61	111,45
Leather and fur products	100,00	110,41	109,54	111,59	121,51
Footwear, except rubber or plastic	100,00	101,71	99,40	101,78	101,66
Wood products, except furniture	100,00	99,54	95,45	92,23	89,16
Furniture and fixtures, excluding metal	100,00	101,85	103,96	112,06	100,27
Paper and products	100,00	97,90	95,03	92,70	94,14
Rubber products	100,00	99,81	101,75	94,74	101,69
Non-metallic mineral products	100,00	99,26	96,29	98,19	92,51
Glass and products	100,00	99,09	100,14	104,45	102,15
Fabricated metal products	100,00	101,76	103,37	103,94	113,03
Other manufacturing industries	100,00	100,13	102,88	100,02	97,86
Non-R&D intensive industries	**100,00**	**101,81**	**101,46**	**102,85**	**103,19**
MANUFACTURING	**100,00**	**100,47**	**101,25**	**102,80**	**104,17**

Table 29: Capital-labour ratio index: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	104,97	79,63	109,81	72,60
Industrial chemicals	100,00	78,37	71,40	66,11	55,86
Other chemicals	100,00	115,61	115,23	131,55	190,83
Petroleum and related products	100,00	104,53	89,89	85,30	114,55
Plastic products	100,00	109,52	93,56	109,96	135,60
Iron and steel	100,00	106,56	120,45	131,47	111,06
Non-ferrous metals	100,00	112,81	130,74	130,45	145,59
Non-electrical machinery	100,00	95,90	87,95	115,55	99,84
Electrical machinery	100,00	88,56	90,39	86,21	73,52
Transport equipment	100,00	94,27	86,61	80,79	83,45
Professional and scientific equipment	100,00	94,05	85,19	101,57	84,29
R&D intensive industries	**100,00**	**100,47**	**95,55**	**104,43**	**106,11**
Food products	100,00	88,93	106,83	125,03	154,07
Beverages	100,00	99,75	111,80	115,91	138,25
Tobacco	100,00	100,02	98,09	98,97	130,96
Textiles	100,00	86,75	120,25	94,40	136,38
Wearing apparel, except footwear	100,00	116,71	103,52	130,08	131,78
Leather and fur products	100,00	106,43	154,11	152,57	196,20
Footwear, except rubber or plastic	100,00	112,92	114,98	110,22	143,32
Wood products, except furniture	100,00	103,43	96,08	77,89	84,84
Furniture and fixtures, excluding metal	100,00	93,80	84,00	91,03	92,93
Paper and products	100,00	104,89	99,31	99,47	88,78
Rubber products	100,00	116,21	115,48	125,70	138,06
Non-metallic mineral products	100,00	88,22	90,42	96,28	80,27
Glass and products	100,00	120,81	145,15	125,27	119,64
Fabricated metal products	100,00	101,93	92,41	81,11	87,98
Other manufacturing industries	100,00	89,73	108,27	104,94	73,56
Non-R&D intensive industries	**100,00**	**102,03**	**109,38**	**108,59**	**119,80**
MANUFACTURING	**100,00**	**101,25**	**102,46**	**106,51**	**112,96**

3.7 Pricing behaviour

Table 30: Fisher price index: 2003–2007

(2003=100)

Industry	2003	2004	2005	2006	2007
Printing and publishing	100,00	101,59	105,88	117,72	115,18
Industrial chemicals	100,00	107,11	113,47	118,80	139,23
Other chemicals	100,00	103,72	111,00	118,55	126,05
Petroleum and related products	100,00	98,08	108,95	118,83	133,44
Plastic products	100,00	108,57	117,26	129,24	129,17
Iron and steel	100,00	96,44	98,59	112,81	149,89
Non-ferrous metals	100,00	103,25	104,89	109,12	148,64
Non-electrical machinery	100,00	110,04	115,52	121,62	129,99
Electrical machinery	100,00	104,15	108,27	112,46	113,24
Transport equipment	100,00	101,29	102,42	103,67	109,39
Professional and scientific equipment	100,00	97,39	99,64	102,64	107,37
R&D intensive industries	**100,00**	**102,88**	**107,81**	**115,04**	**127,42**
Food products	100,00	101,35	99,52	110,08	122,94
Beverages	100,00	109,43	113,77	124,17	131,28
Tobacco	100,00	115,54	136,05	150,91	168,44
Textiles	100,00	98,28	98,29	105,89	117,06
Wearing apparel, except footwear	100,00	96,91	95,64	96,86	98,88
Leather and fur products	100,00	86,41	81,00	80,50	85,03
Footwear, except rubber or plastic	100,00	97,22	95,62	96,19	98,67
Wood products, except furniture	100,00	99,37	103,15	103,75	110,69
Furniture and fixtures, excluding metal	100,00	104,29	105,73	110,55	116,60
Paper and products	100,00	87,61	78,16	77,38	83,53
Rubber products	100,00	103,31	101,81	97,42	113,30
Non-metallic mineral products	100,00	109,01	117,96	120,76	133,00
Glass and products	100,00	102,03	102,36	109,08	120,67
Fabricated metal products	100,00	105,75	110,31	114,33	129,43
Other manufacturing industries	100,00	96,91	95,88	101,38	109,35
Non-R&D intensive industries	**100,00**	**100,89**	**102,35**	**106,62**	**115,92**
MANUFACTURING	**100,00**	**101,88**	**105,08**	**110,83**	**121,67**

Table 31: Price-marginal cost margin: 2003–2007

(ratio)

Industry	2003	2004	2005	2006	2007
Printing and publishing	0,1080	0,1287	0,0992	0,1831	0,0798
Industrial chemicals	0,2589	0,2599	0,2793	0,2602	0,1216
Other chemicals	0,2295	0,2545	0,3109	0,3095	0,1238
Petroleum and related products	0,4690	0,4349	0,4713	0,4687	0,2421
Plastic products	0,2402	0,3623	0,3927	0,4811	0,1006
Iron and steel	0,2218	0,1936	0,2141	0,2544	0,1673
Non-ferrous metals	0,4902	0,5613	0,5871	0,5804	0,2808
Non-electrical machinery	0,2169	0,1968	0,2369	0,3681	0,0869
Electrical machinery	0,2433	0,3536	0,3963	0,3604	0,0920
Transport equipment	0,1196	0,1257	0,1350	0,1181	0,1466
Professional and scientific equipment	0,3894	0,9930	1,0006	0,5900	0,0873
R&D intensive industries	**0,2715**	**0,3513**	**0,3749**	**0,3613**	**0,1390**
Food products	0,2168	0,2097	0,2099	0,2306	0,1026
Beverages	0,3717	0,3491	0,3491	0,4001	0,2564
Tobacco	0,4633	1,2168	0,8341	0,7784	0,2004
Textiles	0,3199	0,4772	0,6075	0,4806	0,0753
Wearing apparel, except footwear	0,2333	0,2314	0,2834	0,3090	0,0955
Leather and fur products	0,4187	0,2502	0,2962	0,3183	0,1125
Footwear, except rubber or plastic	0,6462	0,6038	0,5906	0,3829	0,1221
Wood products, except furniture	0,2177	0,4337	0,4842	0,2249	0,0778
Furniture and fixtures, excluding metal	0,2093	0,2815	0,2908	0,3739	0,0691
Paper and products	0,2574	0,2823	0,2311	0,2359	0,1317
Rubber products	0,1957	0,1548	0,1901	0,1677	0,1103
Non-metallic mineral products	0,5155	0,6404	0,6466	0,6565	0,2088
Glass and products	0,2969	0,3006	0,2961	0,3780	0,1517
Fabricated metal products	0,3201	0,2816	0,3473	0,5365	0,1092
Other manufacturing industries	0,1954	0,2079	0,3797	0,2358	0,0824
Non-R&D intensive industries	**0,3252**	**0,3947**	**0,4024**	**0,3806**	**0,1270**
MANUFACTURING	**0,2984**	**0,3730**	**0,3887**	**0,3709**	**0,1330**

Table 32: Real net exports: 2003–2007

(Rands)

Industry	2003	2004	2005	2006	2007
Printing and publishing	-934 312	-995 841	-963 952	-801 316	-688 142
Industrial chemicals	-2 635 453	-2 946 497	-2 708 229	-2 308 572	-1 496 717
Other chemicals	-826 519	-1 263 487	-957 731	-645 760	-299 536
Petroleum and related products	-1 311 273	-1 396 668	-1 346 540	-1 198 026	-906 089
Plastic products	-59 778	-353 022	-141 743	22 946	170 985
Iron and steel	-1 012 363	-1 304 316	-1 278 743	-1 042 180	-739 909
Non-ferrous metals	-847 257	-935 907	-971 642	-907 957	-642 209
Non-electrical machinery	-1 822 486	-1 945 051	-1 919 873	-1 748 297	-1 565 099
Electrical machinery	-1 061 122	-1 138 525	-1 081 904	-919 388	-827 174
Transport equipment	1 232 584	-288 880	927 575	1 806 731	1 996 558
Professional and scientific equipment	-346 344	-386 981	-398 062	-363 213	-298 031
R&D intensive industries	**-9 624 322**	**-12 955 173**	**-10 840 844**	**-8 105 033**	**-5 295 363**
Food products	-3 039 693	-3 227 894	-3 577 992	-3 221 186	-2 547 324
Beverages	-3 097 704	-3 022 638	-3 180 002	-2 912 228	-2 442 347
Tobacco	-221 079	-218 567	-194 690	-169 958	-130 355
Textiles	319 951	-110 197	343 941	611 023	716 448
Wearing apparel, except footwear	-105 102	-385 135	-85 773	137 043	295 947
Leather and fur products	-43 847	-100 553	-48 283	-3 411	31 104
Footwear, except rubber or plastic	-140 267	-186 934	-137 974	-93 627	-49 792
Wood products, except furniture	-955 462	-1 031 348	-1 009 730	-933 858	-740 597
Furniture and fixtures, excluding metal	-609 415	-674 185	-667 152	-587 836	-488 303
Paper and products	-1 177 728	-1 489 271	-1 654 621	-1 520 078	-1 162 621
Rubber products	109 403	-203 952	21 394	220 239	335 781
Non-metallic mineral products	-763 581	-786 106	-808 145	-730 159	-618 783
Glass and products	-27 888	-111 977	-76 258	-21 123	3 578
Fabricated metal products	-1 619 665	-1 961 992	-1 851 753	-1 640 909	-1 356 231
Other manufacturing industries	-268 100	-304 619	-318 936	-285 779	-237 596
Non-R&D intensive industries	**-11 640 178**	**-13 815 367**	**-13 245 975**	**-11 151 846**	**-8 391 090**
MANUFACTURING	**-21 264 501**	**-26 770 541**	**-24 086 819**	**-19 256 879**	**-13 686 453**

Table 33: Rosenbluth index: 2003–2007

(ratio)

Industry	2003	2004	2005	2006	2007
Printing and publishing	0,0167	0,0214	0,0241	0,0166	0,0227
Industrial chemicals	0,0511	0,0393	0,0369	0,0398	0,0368
Other chemicals	0,0180	0,0154	0,0166	0,0178	0,0201
Petroleum and related products	0,1900	0,1644	0,1963	0,1504	0,1645
Plastic products	0,0266	0,0185	0,0185	0,0118	0,0152
Iron and steel	0,0536	0,0541	0,0468	0,0393	0,0397
Non-ferrous metals	0,0855	0,0576	0,0674	0,0625	0,0699
Non-electrical machinery	0,0127	0,0141	0,0143	0,0081	0,0107
Electrical machinery	0,0110	0,0134	0,0141	0,0117	0,0144
Transport equipment	0,0207	0,0144	0,0144	0,0136	0,0162
Professional and scientific equipment	0,0272	0,0311	0,0292	0,0153	0,0269
R&D intensive industries	**0,0467**	**0,0403**	**0,0435**	**0,0352**	**0,0397**
Food products	0,0136	0,0122	0,0125	0,0113	0,0102
Beverages	0,0769	0,0673	0,0646	0,0669	0,0804
Tobacco	0,4180	0,1257	0,2033	0,1759	0,1443
Textiles	0,0139	0,0150	0,0161	0,0116	0,0168
Wearing apparel, except footwear	0,0240	0,0281	0,0272	0,0182	0,0273
Leather and fur products	0,0544	0,0712	0,0643	0,0433	0,0616
Footwear, except rubber or plastic	0,0598	0,0570	0,0511	0,0461	0,0449
Wood products, except furniture	0,0299	0,0264	0,0227	0,0144	0,0250
Furniture and fixtures, excluding metal	0,0318	0,0319	0,0307	0,0128	0,0217
Paper and products	0,0474	0,0429	0,0547	0,0520	0,0549
Rubber products	0,1352	0,1040	0,0840	0,0701	0,0673
Non-metallic mineral products	0,0186	0,0260	0,0253	0,0173	0,0229
Glass and products	0,1012	0,1304	0,1585	0,1094	0,1216
Fabricated metal products	0,0150	0,0144	0,0135	0,0067	0,0093
Other manufacturing industries	0,0177	0,0253	0,0211	0,0165	0,0172
Non-R&D intensive industries	**0,0705**	**0,0519**	**0,0566**	**0,0448**	**0,0484**
MANUFACTURING	**0,0586**	**0,0461**	**0,0501**	**0,0400**	**0,0441**

Table 34: Number of firms: 2003–2007

(count)

Industry	2003	2004	2005	2006	2007
Printing and publishing	152	102	90	140	102
Industrial chemicals	72	89	91	84	91
Other chemicals	150	171	143	141	128
Petroleum and related products	39	51	38	46	47
Plastic products	92	108	104	153	117
Iron and steel	77	92	95	112	109
Non-ferrous metals	44	58	48	57	56
Non-electrical machinery	196	187	163	241	218
Electrical machinery	223	146	136	171	138
Transport equipment	195	260	243	285	272
Professional and scientific equipment	95	49	54	147	57
R&D intensive industries	**1 335**	**1 313**	**1 205**	**1 577**	**1 335**
Food products	220	248	241	267	278
Beverages	54	69	69	68	59
Tobacco	11	14	10	13	15
Textiles	140	113	98	149	91
Wearing apparel, except footwear	89	76	72	118	66
Leather and fur products	32	34	34	50	30
Footwear, except rubber or plastic	28	30	34	50	39
Wood products, except furniture	87	66	72	162	72
Furniture and fixtures, excluding metal	63	56	58	147	81
Paper and products	70	68	67	67	63
Rubber products	18	32	33	43	42
Non-metallic mineral products	157	93	93	133	108
Glass and products	39	28	22	34	23
Fabricated metal products	145	161	153	262	223
Other manufacturing industries	167	105	89	140	133
Non-R&D intensive industries	**1 320**	**1 193**	**1 145**	**1 703**	**1 323**
MANUFACTURING	**2 655**	**2 506**	**2 350**	**3 280**	**2 658**

Table 35: Elasticity of demand: 2003–2007

(ratio)

Industry	2003	2004	2005	2006	2007
Printing and publishing	3,44	2,33	3,01	1,79	4,12
Industrial chemicals	2,07	1,98	1,79	1,91	4,09
Other chemicals	1,75	1,52	1,10	1,18	3,05
Petroleum and related products	0,62	0,84	0,55	0,45	1,57
Plastic products	1,49	0,71	0,61	0,42	1,97
Iron and steel	2,61	3,32	2,83	2,36	3,56
Non-ferrous metals	1,12	0,89	0,83	0,91	2,00
Non-electrical machinery	1,67	1,98	1,39	0,65	3,81
Electrical machinery	1,46	0,70	0,59	0,71	2,75
Transport equipment	4,75	4,29	3,79	4,68	4,09
Professional and scientific equipment	0,98	0,14	0,15	0,53	1,57
R&D intensive industries	**2,00**	**1,70**	**1,51**	**1,42**	**2,96**
Food products	2,05	2,15	2,13	1,94	4,12
Beverages	1,57	1,78	1,74	1,54	2,45
Tobacco	1,40	0,20	0,40	0,47	1,68
Textiles	0,75	0,37	0,24	0,38	1,72
Wearing apparel, except footwear	1,25	1,27	0,88	0,95	2,20
Leather and fur products	0,49	1,45	1,06	0,95	2,11
Footwear, except rubber or plastic	0,30	0,33	0,35	0,87	1,68
Wood products, except furniture	1,77	0,45	0,34	1,47	2,67
Furniture and fixtures, excluding metal	1,26	0,74	0,71	0,61	2,82
Paper and products	1,92	1,56	2,32	2,19	3,89
Rubber products	1,96	3,26	2,24	2,74	3,91
Non-metallic mineral products	0,85	0,55	0,52	0,50	1,72
Glass and products	1,92	1,81	1,79	1,45	2,89
Fabricated metal products	0,93	1,16	0,78	0,35	2,49
Other manufacturing industries	2,26	1,90	0,60	1,38	3,91
Non-R&D intensive industries	**1,38**	**1,27**	**1,07**	**1,18**	**2,69**
MANUFACTURING	**1,69**	**1,48**	**1,29**	**1,30**	**2,82**

3.8 Operational performance

Table 36: Operating profit in current prices: 2003–2007

(R million)

Industry	2003	2004	2005	2006	2007
Printing and publishing	721	740	632	1 387	802
Industrial chemicals	7 569	7 580	8 355	8 726	9 402
Other chemicals	6 276	7 001	7 883	9 370	11 151
Petroleum and related products	14 062	15 172	16 129	16 965	21 627
Plastic products	2 015	2 253	2 382	2 728	3 065
Iron and steel	8 775	9 275	10 169	14 129	18 377
Non-ferrous metals	6 957	7 419	7 978	9 126	10 117
Non-electrical machinery	3 027	3 184	3 405	4 075	4 663
Electrical machinery	2 886	3 030	3 332	3 660	3 877
Transport equipment	8 626	9 301	10 421	10 808	12 678
Professional and scientific equipment	586	601	685	1 021	868
R&D intensive industries	**61 499**	**65 555**	**71 371**	**81 995**	**96 627**
Food products	10 855	11 485	12 178	15 001	17 726
Beverages	6 473	7 549	8 091	10 293	11 457
Tobacco	2 647	2 732	2 887	3 415	4 308
Textiles	1 484	1 547	1 477	1 533	1 720
Wearing apparel, except footwear	1 098	1 054	1 020	1 326	1 454
Leather and fur products	392	414	402	424	490
Footwear, except rubber or plastic	447	429	405	438	454
Wood products, except furniture	1 552	1 637	1 625	1 632	1 799
Furniture and fixtures, excluding metal	600	716	727	1 092	1 101
Paper and products	5 092	4 931	5 334	5 558	6 314
Rubber products	668	730	811	822	872
Non-metallic mineral products	4 296	4 850	5 405	5 605	6 647
Glass and products	821	899	975	1 255	1 126
Fabricated metal products	3 883	4 125	4 526	5 418	6 635
Other manufacturing industries	1 155	1 156	1 286	1 199	1 448
Non-R&D intensive industries	**41 463**	**44 256**	**47 150**	**55 012**	**63 554**
MANUFACTURING	**102 963**	**109 811**	**118 521**	**137 007**	**160 181**

Table 37: Undistributed profit in current prices: 2003–2007

(R million)

Industry	2003	2004	2005	2006	2007
Printing and publishing	220	218	163	552	267
Industrial chemicals	3 389	3 317	3 716	3 952	4 322
Other chemicals	3 014	3 304	3 782	4 570	5 480
Petroleum and related products	6 834	7 381	7 845	8 269	10 610
Plastic products	999	1 069	1 166	1 362	1 540
Iron and steel	4 235	4 449	4 895	6 888	9 016
Non-ferrous metals	3 352	3 564	3 836	4 415	4 912
Non-electrical machinery	1 240	1 271	1 370	1 718	2 017
Electrical machinery	1 284	1 337	1 490	1 675	1 788
Transport equipment	4 251	4 606	5 163	5 310	6 261
Professional and scientific equipment	241	244	283	455	381
R&D intensive industries	**29 059**	**30 760**	**33 710**	**39 166**	**46 595**
Food products	4 972	5 252	5 555	6 969	8 352
Beverages	2 772	3 278	3 503	4 604	5 207
Tobacco	1 291	1 328	1 404	1 669	2 118
Textiles	726	757	722	734	837
Wearing apparel, except footwear	533	471	497	657	728
Leather and fur products	189	194	195	212	246
Footwear, except rubber or plastic	203	187	183	206	216
Wood products, except furniture	633	665	656	671	762
Furniture and fixtures, excluding metal	209	253	257	449	457
Paper and products	2 369	2 270	2 473	2 603	2 991
Rubber products	329	334	405	400	434
Non-metallic mineral products	2 033	2 297	2 560	2 670	3 194
Glass and products	407	432	476	624	561
Fabricated metal products	1 698	1 752	1 957	2 428	3 042
Other manufacturing industries	537	534	597	556	682
Non-R&D intensive industries	**18 900**	**20 003**	**21 439**	**25 450**	**29 827**
MANUFACTURING	**47 959**	**50 763**	**55 149**	**64 616**	**76 422**

Table 38: Rate of return: 2003–2007

(percentage)

Industry	2003	2004	2005	2006	2007
Printing and publishing	35,11	34,16	30,75	42,70	37,73
Industrial chemicals	46,39	45,66	46,18	46,76	47,36
Other chemicals	48,67	48,09	48,63	49,18	49,48
Petroleum and related products	49,06	49,09	49,08	49,15	49,39
Plastic products	49,70	48,27	49,30	50,00	50,31
Iron and steel	48,83	48,63	48,74	49,16	49,37
Non-ferrous metals	48,77	48,68	48,71	48,90	49,03
Non-electrical machinery	43,59	42,79	43,03	44,49	45,33
Electrical machinery	46,18	45,93	46,36	47,09	47,40
Transport equipment	50,00	49,68	50,00	50,00	50,12
Professional and scientific equipment	43,72	43,31	43,85	46,21	45,83
R&D intensive industries	**46,37**	**45,84**	**45,88**	**47,60**	**47,40**
Food products	47,12	47,07	46,99	47,58	48,08
Beverages	44,97	45,42	45,32	46,36	46,93
Tobacco	49,16	49,07	49,07	49,24	49,44
Textiles	50,00	49,29	50,00	50,00	50,58
Wearing apparel, except footwear	49,03	46,33	49,19	50,00	50,55
Leather and fur products	48,87	47,86	49,02	49,94	50,24
Footwear, except rubber or plastic	46,76	45,58	46,63	47,90	48,44
Wood products, except furniture	43,44	43,32	43,15	43,69	44,74
Furniture and fixtures, excluding metal	38,69	39,12	39,25	43,68	44,11
Paper and products	47,63	47,28	47,52	47,84	48,27
Rubber products	50,00	47,03	50,00	50,00	50,97
Non-metallic mineral products	48,19	48,20	48,20	48,40	48,70
Glass and products	49,66	48,71	49,19	49,82	49,90
Fabricated metal products	45,65	44,70	45,27	46,41	47,18
Other manufacturing industries	47,62	47,38	47,56	47,52	48,06
Non-R&D intensive industries	**47,12**	**46,42**	**47,09**	**47,89**	**48,41**
MANUFACTURING	**46,74**	**46,13**	**46,48**	**47,75**	**47,90**

Table 39: Interest cover: 2003–2007

(ratio)

Industry	2003	2004	2005	2006	2007
Printing and publishing	8,79	8,98	10,47	5,52	10,64
Industrial chemicals	1,60	1,58	1,58	1,65	1,59
Other chemicals	2,32	2,23	2,22	2,10	1,98
Petroleum and related products	1,11	1,11	1,11	1,13	1,10
Plastic products	3,86	3,65	3,65	3,55	3,71
Iron and steel	1,55	1,59	1,60	1,48	1,50
Non-ferrous metals	1,24	1,22	1,22	1,21	1,26
Non-electrical machinery	3,22	3,37	3,44	3,28	3,48
Electrical machinery	2,91	2,78	2,75	2,71	2,85
Transport equipment	2,47	2,39	2,36	2,44	2,35
Professional and scientific equipment	1,86	1,87	1,82	1,60	1,82
R&D intensive industries	**2,81**	**2,80**	**2,93**	**2,42**	**2,93**
Food products	2,01	2,08	2,12	2,00	1,91
Beverages	1,52	1,53	1,56	1,50	1,51
Tobacco	1,18	1,20	1,22	1,21	1,15
Textiles	2,80	2,63	2,72	2,80	2,79
Wearing apparel, except footwear	4,29	4,57	4,51	3,78	3,63
Leather and fur products	1,75	1,85	1,80	1,78	1,69
Footwear, except rubber or plastic	1,98	2,06	2,01	1,96	2,09
Wood products, except furniture	3,50	3,47	3,54	3,61	3,36
Furniture and fixtures, excluding metal	4,32	4,17	4,15	3,22	3,51
Paper and products	1,84	1,84	1,79	1,77	1,67
Rubber products	3,58	3,28	3,27	3,39	3,22
Non-metallic mineral products	1,46	1,44	1,43	1,51	1,44
Glass and products	2,00	2,03	2,14	1,71	2,29
Fabricated metal products	3,03	3,18	3,19	3,03	3,04
Other manufacturing industries	1,91	2,01	1,98	2,15	1,97
Non-R&D intensive industries	**2,48**	**2,49**	**2,50**	**2,36**	**2,35**
MANUFACTURING	**2,65**	**2,64**	**2,71**	**2,39**	**2,64**

4. Technical annex

4.1 Concordance tables

The concordance table for manufacturing between ISIC Revision 2 (UNIDO, 2005: 18-20; UN, 2004: 199-221) and the South African Standard Industrial Classification for All Economic Activities (SA SIC, 5th Edition, Statistics South Africa, 1993: 13-25) is presented in table C. In addition a detailed description is provided in table D. The replication achieved is identical to the classification of industry proposed under ISIC. However, due to conversion, industries re-group into 26 branches in relation to 28 under ISIC.

One set of affected industries is petroleum refineries (353), and miscellaneous products of petroleum and coal (354), which are now merged into one – manufacture of petroleum and related products. The other is pottery, china and earthenware (361), and structural clay products, cement, lime, plaster, and other associated products (369), which are also merged into one - manufacture of non-metallic mineral products.

The merging of the above industries is also adopted by other countries (UNIDO, 2005: 232, 492, 538) due to the closeness in production processes between them. However an exact conversion is not possible in all instances owing to a country's specific conditions, where industries are originally grouped according to what most closely resembles the structure of production in that country.

Table C: Concordance between SA SIC and ISIC: Manufacturing sector

Industry	SA SIC Code	ISIC Code
Food products	301/2/3/4	311/2
Beverages	305	313
Tobacco	306	314
Textiles	311/2/3	321
Wearing apparel, except footwear	314	322
Leather and fur products	315/6	323
Footwear, except rubber or plastic	317	324
Wood products, except furniture	321/2	331
Furniture and fixtures, excluding metal	391	332
Paper and products	323	341
Printing and publishing	324/5	342
Industrial chemicals	333/4/6	351
Other chemicals	335	352
Petroleum and related products	331/2	353/4
Rubber products	337	355
Plastic products	338	356
Non-metallic mineral products	342	361/9
Glass and products	341	362
Iron and steel	351/3	371
Non-ferrous metals	352	372
Fabricated metal products	354/5	381
Non-electrical machinery	356/7/9	382
Electrical machinery	326/358/361/2/3/4/5/6/371/2/3	383
Transport equipment	381/2/3/4/5/6/7	384
Professional and scientific equipment	374/5/6	385
Other manufacturing industries	392/5	390

Table D: Description of concordance between SA SIC and ISIC: Manufacturing sector

ISIC	SIC	Division/Branch
311/2	n.e.s.	**Food manufacturing**
	301	Produce, process and preserve meat, fish, fruit, vegetables, oils and fats
	302	Manufacture dairy products
	303	Manufacture grain and mill products, starches and starch products and prepared animal feeds
	304	Manufacture other food products
313	305	**Beverage industries**
314	306	**Tobacco manufactures**
321	n.e.s.	**Manufacturing of textiles**
	311	Spin, weave and finish textiles
	312	Manufacture other textiles
	313	Manufacture knitted and crocheted fabrics and articles
322	314	**Manufacturing of wearing apparel, except footwear**
323	n.e.s.	Manufacture leather and products of leather, leather substitutes and fur, except footwear and fur apparel
	315	Dress and dye fur; manufacture articles of fur
	316	Tan and dress leather; manufacture luggage, handbags, saddlers and harnesses
324	317	**Manufacturing of footwear**
331	n.e.s	**Manufacturing of wood and wood and cork products, except furniture**
	321	Saw milling and planing of wood
	322	Manufacture products of wood, cork, straw and plaiting materials
332	391	**Manufacturing of furniture**
341	323	**Manufacturing of paper and paper products**
342	n.e.s.	**Printing, publishing and allied industries**
	324	Publish
	325	Printing and service activities related to printing
351	n.e.s.	**Manufacturing of industrial chemicals**
	333	Process nuclear fuel
	334	Manufacture basic chemicals
	336	Manufacture man-made fibres

Table D: Description of concordance between SA SIC and ISIC: Manufacturing sector (continued)

352	335	**Manufacturing of other chemical products**
353/4	n.e.s.	**Petroleum and related products**
	331	Manufacturing of miscellaneous products of petroleum and coal including manufacture of coke oven products
	332	Petroleum refineries/synthesizers
355	337	**Manufacturing of rubber products**
356	338	Manufacture plastic products
361/9	342	**Manufacturing of non-metallic mineral products n.e.c.**
362	341	**Manufacturing of glass and glass products**
371	n.e.s.	**Iron and steel basic industries**
	351	Manufacturing of basic iron and steel
	353	Cast metals
372	352	**Manufacturing of basic precious and non-ferrous metals**
381	n.e.s.	**Manufacturing of fabricated metal products, except machinery and equipment**
	354	Manufacture structural metal products, tanks, reservoirs and steam generators
	355	Manufacture other fabricated metal products; metalwork service activities
382	n.e.s.	**Manufacturing of machinery except electrical**
	356	Manufacture general purpose machinery
	357	Manufacture special purpose machinery
	359	Manufacture office, accounting and computing machinery
383	n.e.s.	**Manufacturing of electrical machinery, apparatus, appliances and supplies**
	326	Reproduce recorded media
	358	Manufacture household appliances
	361	Manufacture electric motors, generators and transformers.
	362	Manufacture electricity distribution and control apparatus
	363	Manufacture insulated wires and cables
	364	Manufacture accumulators, primary cells and primary batteries
	365	Manufacture electric lamps and lighting equipment
	366	Manufacture other electrical equipment n.e.c.

Table D: Description of concordance between SA SIC and ISIC: Manufacturing sector (concluded)

	371	Manufacture electronic valves and tubes and other electric components
	372	Manufacture television and radio transmitters and apparatus for line telephony and line telegraphy
	373	Manufacture television and radio receivers, sound or video recording or reproducing apparatus and associated goods.
384	n.e.s.	**Manufacturing of transport equipment**
	381	Manufacture motor vehicles
	382	Manufacture bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
	383	Manufacture parts and accessories for motor vehicles and their engines
	384	Build and repair ships and boats
	385	Manufacture railway and tramway locomotives and rolling stock
	386	Manufacture aircraft and space craft
	387	Manufacture transport equipment n.e.c.
385	n.e.s.	**Manufacturing of professional and scientific, and measuring and controlling equipment n.e.c., and of photographic and optical goods**
	374	Manufacture medical appliances and instruments and appliances for measuring, checking, testing, navigating and other purposes, except optical instruments
	375	Manufacture optical instruments and photographic equipment
	376	Manufacture watches and clocks
390	n.e.s.	**Other manufacturing industries**
	392	Manufacture n.e.c.
	395	Recycle n.e.c

4.2 Classifications

To organize information meaningfully and systematically into a standard format that is useful for determining any similarity or lack thereof across industries, classifications are extensively used throughout the Compendium to attain structured groupings on a number of characteristics by which an industry can be described in general. These include type of ownership, technological status, R&D intensiveness, and composition of human capital.

The type of ownership as to whether control over firms in an industry is in private or government hands is determined by the approach suggested in sections 4 and 5 of the System of National Accounts, 1993 (UN, 1993: 87-119). Here the different forms of business ownership by which a firm is legally established are identified according to their institutional belonging. Table E depicts this institutional breakdown.

The identification of industries by technological status is adapted from UNIDO (2002: 146) and OECD (2005: 172), and this for their R&D intensiveness, which distinguishes between R&D-intensive and non-R&D-intensive industries, is adopted from Scott (1984: 82-83). The resultant scheme is displayed in table F. Table G shows industries by technological status and R&D intensity after application of this scheme at an industry-by-industry level.

The R&D or innovation-based classification decomposes industries into R&D intensive and non-R&D intensive depending on their technological status. This classification has its origin in the nature of industrial processes which are implicitly considered in the construction of the International Standard Industrial Classification System of All Economic Activities (ISIC). Here industries are defined in terms of establishments, i.e., firms, primarily engaged in producing a product or group of products that are related by the technical process used in production. Thus we can hypothetically distinguish between whether such production process or processes tend to remain unchanged, eventually becoming outdated without necessarily inhibiting industries from their existence, or if they are subject to constant change if the industry is to exist at all. The former category to which some industries belong is referred to as Non-R&D intensive, and the latter to which other industries belong is named R&D intensive.

Table E: Breakdown and composition of ownership by institutional sector

Institutional sector	Forms of ownership
Private sector	Individual enterprises, partnerships, public/listed companies, private/unlisted companies, close corporations, cooperative societies.
Public sector	Government enterprises, public corporations.
Other	Non-profit institutions like public-private partnerships, community based initiatives, etc.

Table F: Degree of industry innovation by technological status of industries

Industries by R&D intensity	Technological status
R&D-intensive	Medium-high tech, high-tech industries.
Non-R&D-intensive	Low tech, low-medium tech industries.

Table G: Technological status and R&D intensity: Manufacturing industries

Industry	ISIC Code	Technological Status	R&D Intensity
Food products	311/2	Low tech	Non-R&D intensive
Beverages	313	Low tech	Non-R&D intensive
Tobacco	314	Low tech	Non-R&D intensive
Textiles	321	Low-medium tech	Non-R&D intensive
Wearing apparel, except footwear	322	Low-medium tech	Non-R&D intensive
Leather and fur products	323	Low-medium tech	Non-R&D intensive
Footwear, except rubber or plastic	324	Low-medium tech	Non-R&D intensive
Wood products, except furniture	331	Low tech	Non-R&D intensive
Furniture and fixtures, excluding metal	332	Low-medium tech	Non-R&D intensive
Paper and products	341	Low tech	Non-R&D intensive
Printing and publishing	342	Medium-high tech	R&D-intensive
Industrial chemicals	351	Medium-high tech	R&D-intensive
Other chemicals	352	High tech	R&D-intensive
Petroleum and related products	353/4	Medium-high tech	R&D-intensive
Rubber products	355	Low tech	Non-R&D intensive
Plastic products	356	Medium-high tech	R&D-intensive
Non-metallic mineral products	361/9	Low-medium tech	Non-R&D intensive
Glass and products	362	Low tech	Non-R&D intensive
Iron and steel	371	Medium-high tech	R&D-intensive
Non-ferrous metals	372	Medium-high tech	R&D-intensive
Fabricated metal products	381	Low-medium tech	Non-R&D intensive
Non-electrical machinery	382	Medium-high tech	R&D-intensive
Electrical machinery	383	High tech	R&D-intensive
Transport equipment	384	High tech	R&D-intensive
Professional and scientific equipment	385	High tech	R&D-intensive
Other manufacturing industries	390	Low-medium tech	Non-R&D intensive

Considering that innovation and knowledge go hand in hand, by extension the next two classifications are applied to the workforce of each industry to look at the composition of employment in terms of the human capital it embodies. Human capital encapsulates all the knowledge and expertise that a workforce accumulates over time to enable it to increase the productivity of an industry (Doyle, 2005: 24, 296, 348).

The classification of employment by type of skill, which is shown in table H, is adapted from Hoffmann (1999: 6-9) and derives from occupations held.

The different levels of skill highlight the differences in understanding that the implementation of tasks in different jobs requires. The resultant skill levels demonstrate differences in the range and complexity of the tasks involved in a job. They reflect the type of knowledge applied, tools and equipment used, materials worked with, and the nature of the goods and services produced.

The classification of employment by its knowledge makeup, which is shown in table I, is adopted from HRSDC (1997: 1-3) and Masse, Roy, and Gingras (1999: 9-12). It also derives from occupations held, and treats knowledge as a basis for the organisation and conduct of economic activities. This classification makes it possible to understand how transformed the skill requirements of an industry's workforce are, in light of the type of technologies used in production processes in terms of the complexity and technical sophistication they bring to economic activities.

According to the knowledge-based classification the workforce is divided into two main categories, namely, information and non-information workers. Information workers are further divided into two groups: data and knowledge workers. Data occupations involve the manipulation of symbolic information while knowledge occupations involve the development of ideas or of expert opinions. In other words, data workers in most clerical occupations, use, transmit, or manipulate knowledge while knowledge workers such as engineers and scientists produce it. The non-information category is composed of goods workers and services workers. Workers in the former category such as machine operators and assemblers transform materials, whereas workers in the latter group such as security guards and babysitters perform personal services. In either event the more routine or compartmentalised nature of the tasks entailed in these occupations implies that they carry no improvement or creation of knowledge.

Table H: Employment by skill type determined from occupations

Skill type	Occupations
High-skilled	Legislators, senior officials and managers, professionals.
Moderately-highly skilled	Technicians and associate professionals, skilled agricultural and fishery workers.
Low-moderately skilled	Clerks, service workers and shop and market sales workers, plant and machine operators and assemblers.
Low-skilled	Elementary occupations, craft and related workers.
Other	Occupation not elsewhere defined, occupation not adequately defined, unspecified, not applicable.

Table I: Employment by knowledge type determined from occupations

Knowledge type	**Occupations**
Knowledge employees	Legislators, senior officials and managers, professionals.
Data employees	Technicians and associate professionals, clerks.
Goods employees	Plant and machine operators and assemblers, skilled agricultural and fishery workers.
Services employees	Service workers and shop and market sales workers, craft and related workers, elementary occupations.
Information type employees	Knowledge, data occupations.
Non-information type employees	Goods, services occupations.
Other	Occupation not elsewhere defined, occupation not adequately defined, unspecified, not applicable.

4.3 Selected Indicators

The choice of Compendium indicators for the study of the performance of industry is motivated by a number of proposals outlined in several key references (Eurostat, 2003: 182-190; Hoffmann, 1999: 6-9; HRSDC, 1997: 1-3; Masse, Roy, and Gingras, 1999: 9-12; OECD, 2001: 13-18; OECD, 2002: 3; OECD, 2005: 181-183; OECD, 2007: 16; UN, 2003: 14-15; UNIDO, 2005: 8-11).

The resultant indicators on which information is presented are captured in table J and their interpretation is provided next to them.

Table J: Economic indicators and their interpretation

Category	Indicator	Interpretation
General economic level and performance		
	Ownership	Right of control over an enterprise.
	Production	Amount of output produced.
	Value added	Amount of improvement to products after passage through the production process.
	Capital stock	Amount of physical capital held.
	Index of real production	Growth in output.
	Index of real value added	Growth in output improvement.
	Index of real capital stock	Growth in physical capital held.
Employment		
	Number of employed	Job creation.
	Remuneration	Compensation of employees.

Table J: Economic indicators and their interpretation (continued)

	Personnel costs	Compensation per employee.
	Index of real remuneration	Growth in labour costs.
	Employment by skills type	Capability of workforce.
	Employment by knowledge type	Expertise of workforce.
Productivity		
	Labour productivity	Effectiveness of labour to generate value added.
	Capital productivity	Effectiveness of capital usage to generate value added.
	Total factor productivity	Effectiveness of all factors of production to generate value added.
	Capital-labour ratio	Capital intensity.
Pricing behaviour		
	Fisher price index	General level of prices that captures substitution effect.

Table J: Economic indicators and their interpretation (concluded)

	Price-marginal cost margin	Mark-up of general price level over marginal cost level of operations.
	Real net exports	Real gains from international trade.
	Rosenbluth index	Extent to which any firm can expect to have significant industry presence.
	Number of firms	Industry structure.
	Elasticity of demand	Responsiveness of producer prices to changes in demand conditions.
Operational performance		
	Operating profit	Realised earnings from principal/main trading activity.
	Undistributed profit	Profit retained for reinvestment in operations or for purpose of meeting future capital needs.
	Rate of return	Ability to generate profit for reinvestment in operations from invested capital.
	Interest cover	Earnings/income available to service debt.

4.4 Derivation of indicators

Table K shows the calculation procedures in the estimation of the composite indicators of the Compendium, i.e., those involving more than a single construct. This is accompanied by a clarification of the additional steps taken with reference to those cases which may be less than clear-cut in their computations.

Regarding the procedure for calculating capital stock the OECD manual on measuring capital (2001b: 89) advises that:

> "no strong conclusion has been reached on the matter and much speaks for solutions that are governed by data availability."

In terms of the calculation procedure, capital income is represented by gross operating surplus (OECD, 2001a: 69). As for the rate of return, there are a number of proposals made. One proposal is to take the rate of return as the interest rate for government bonds (OECD, 2001a: 70), and another is to use the average of the rate of interest earned and rate of interest paid (OECD, 2001b: 88). This average can be seen as an estimate of the "pure" rate of return, i.e. the compensation that lenders demand for postponing consumption to a future period.

Overall, there is no specific practice agreed upon in the selection of the rate of return metric due to the same reservations about what can be done best with available data.

In the Compendium, the rate of return applied to the calculation of capital stock is the *average* between the undistributed profit to capital expenditure at replacement value and the average of interest earned and interested paid expressed as a proportion of total income. The incorporation of replacement value provides an insight of the long-term range of investment decisions since this value depicts the long-run cost of providing for buying comparable quality assets used up in the production process.

Table K: Calculation procedures: Compendium indicators

Indicator	Procedure	Sources
Production	sales + change in inventories	UN (1993: 131)
Value added	production – intermediate consumption	UN (2000: 48)
Capital stock	capital income/rate of return	OECD (2001a: 70); OECD (2001b: 89)
Number of employed	average of employment numbers for March and September of each year	ILO (1995: 47)
Labour productivity	index of real value added/index of number of employed	OECD (2001: 15, 17, 53, 68); World Bank (1995: 103); Statistics Singapore (2007)
Capital productivity	index of real value added/index of real capital stock	OECD (2001: 15, 17, 53, 68); World Bank (1995: 103)
Total factor productivity	index of real value added/index of real combined inputs where combined inputs = compensation of employees + intermediate consumption + capital stock	OECD (2001: 15, 17, 53, 68); World Bank (1995: 103)
Capital-labour ratio	index of real capital stock/index of number of employed	Mohr (2001: 165)
Price-marginal cost margin	herfindahl index/elasticity of demand	Church and Ware (2000: 428)

Table K: Calculation procedures: Compendium indicators (concluded)

Elasticity of demand	|(total revenue/total profit) * herfindahl index| where total profit ~ operating profit	Tirole (1998: 223)
Real net exports	real total income - real value added	SADC (1999: 93)
Rosenbluth index	1/[n * (1 – G)] where n is the number of firms, and G is the Gini index	Leach (1997: 16)
Gini index	$2/\mu N^2 * (\sum_{i=1}^{N} r_i * y_i) – [(N + 1)/N]$ where μ is the mean value of the distribution, N the number of intervals, y_i the i^{th} interval value, and r_i the rank of the i^{th} value in an ascending order	Karagiannis and Kovacevic (2000: 120)
Rate of return	(undistributed profit/capital expenditure at replacement value) * 100	Adapted from proposals in OECD (2003: 12-14)
Interest cover	total income/interest paid where total income = compensation of employees + gross operating surplus	Kolitz and Rabin (1993: 8)

Interest paid is obtained as the difference between cost of capital and depreciation (Church and Ware, 2000: 427; World Bank, 1995: 103). If it is assumed that markets are in equilibrium, meaning that they clear in the sense that supply equals demand, and by extension that for each industry total inputs equal total outputs, Statistics Canada (2007) proposes that in turn, cost of capital can be calculated as output *less* labour and intermediate expenses. This approach is also adopted here to determine the cost of capital.

Once determined, interest paid also feeds as the denominator to the interest cover ratio.

Interest earned is the balance between the sum of net operating surplus and interest paid *less* pre-tax profit (Statistics New Zealand, 2006: 3). Net operating surplus on the other hand is gross operating surplus less depreciation (SARB, 2005: 182).

The taking of averages in the determination of employment levels produces extreme values in a number of instances, which distorts a clear reading of the pattern of employment. This also extends to the compensation per employee, i.e. personnel costs and as a consequence also feeds into total compensation, i.e. remuneration. Anscombe and Tukey (1963: 146, 149), and Wilcox (2005: 2121) suggest that such cases can be resolved by winsorisation which cleans out the data set from its unusually large or small values.

Winsorising the values means that a predetermined percentage of the smallest and largest values are replaced with the next in order smallest and largest values respectively. Wilcox (2005: 2121) suggests a predetermined percentage of 10%. The figures on employment and compensation including compensation per employee that appear in this Compendium were obtained from the application of this technique using the suggested 10%. For identical reasons, the same winsorisation technique was also applied to the 2007 figures of elasticity of demand. In turn the associated changes were also carried through to the numbers of the price-marginal cost margin.

The procedures for calculating the price-marginal cost margin and elasticity of demand are derived under the assumptions of homogeneity and proportionality. The homogeneity assumption holds that: (a) each industry produces a single output (i.e. all the products of the industry are either perfect substitutes for one another or are produced in fixed proportions; (b) each industry has a single input structure (i.e. one which does not vary in response to changes in product mix); and (c) there is no substitution between the products of *different* industries. The proportionality assumption holds that average costs do not vary with output. This means that the change in output of an industry will lead to proportional changes in the quantities of its intermediate and primary inputs (i.e., for any output, each of these inputs will be a fixed proportion of the total). These assumptions are realistic for the reference year for which they are calculated. In such an instance the time horizon to which they apply, for instance a year or less, is short enough for them not to be weakened/invalidated by changes in product mix (and consequent changes in inputs), introduction of new products and/or materials, substitution of imports for local

produce or vice versa, economies of scale, and technological change involving the substitution of factors (e.g., more capital, less labour).

The determination of the concentration indices is done according to grouped data using deciles of turnover, which is taken to be the measure of industry size. The starting point is the calculation of the Gini index (G). This is calculated according to the method described in Karagiannis and Kovacevic (2000: 120) shown in table K. Once the Gini index is obtained, it feeds directly into the calculation of the Rosenbluth index as shown.

Two options are available to calculate real net exports. Table 5 gives the method that is used here. The alternative approach which yields theoretically equivalent results is to take the difference between real exports and imports obtained from deflation of the current values of exports and imports by their export price and import price indices respectively (BLS, 1997: 155).

As an interpretation note to the elasticity figures, one may consult Reekie and Crook (1995: 179). In brief, an elasticity of demand less than 1 in absolute terms signals that demand is inelastic. Conversely elasticity greater than 1 in absolute terms signals that demand is elastic. When there are few substitutes, demand tends to be inelastic and vice versa. Necessities have relatively inelastic demand. Within limits, they may be bought at any price. On the other hand luxuries have more elastic demands, and consumption will be more price sensitive for them. Absolutely inexpensive products will have less elastic demand than more expensive ones. And derived demand will be less elastic than primary demand.

Finally, as observed earlier in the key findings section a handful of indicators are considered by their compound annual growth rate. This is calculated from the last (L) and first (F) value in a series by the following standard expression (ITU, 2007: 204):

$$[(L/F)^{1/\text{number of years}} - 1] * 100$$

4.5 Deflation

The derivation of many of the indicators in the Compendium involves volume indices.

Deflation gives the indicator in terms of volume and these figures can in turn be converted into a volume index, which is also referred to as an index of real values. The resulting indices are conceptually equivalent to indices that are developed using data based on physical quantities of products (BLS, 1997: 104).

Deflation entails the derivation of real values for a given indicator. It involves the division of an indicator's nominal value by a general price index, which in this instance is the Fisher price index.

The choice of an appropriate price index for manufacturing as the sector of coverage in the Compendium is of particular relevance given its innovative nature. By definition, it comprises firms that are engaged in the physical or chemical transformation of materials, substances, or components into new products (UN, 2004: 67). In acknowledgment of this, Eurostat (2006: 52-55) advocates the use of a Paasche-type, i.e. price deflator price index for industry inflation and deflation vis-à-vis a Laspeyers-type, i.e. producer price index. The former operates under the assumption that the current structure of production is more or less similar to that of the previous periods, whereas the latter assumes that the structure of production in the base period will remain more or less constant as one moves forward in time (Eurostat, 2006: 53). It is further explained that:

> "In reality observation units appear and disappear, the output mix of observation unit's changes, some products/services disappear from the market, and new products/services are introduced. Especially in areas with frequent technological changes this will have the effect that a direct Laspeyres price index is unable to track current price changes adequately. In some cases, it is even impossible to construct such a price index because products/services existing in the base period are no longer produced in the comparison period."
>
> Eurostat (2006: 65)

Conversely it appears the use of the Laspeyres price index will be appropriate for these industries where innovation does not operate at full throttle.

Aside from having to have comprehensive knowledge of the innovative activity prevailing in different industries so that we know which index to apply to which industry, there is no expectation for the indices to coincide in level or movement.

The Paasche index (P) will exceed its Laspeyers counterpart if prices and quantities tend to move in the same direction with the passage of time (UN, 1993: 383-384). On the other hand the Laspeyers index (L) will exceed its Paasche counterpart if prices and quantities tend to move in opposite directions over time (UN, 1993: 383-384). To compensate for these divergences as well as to deal with the lack of comprehensive knowledge about innovative activity, and to enable one to know which index to apply where, the Fisher price index (F) may be used. This index falls between the two, i.e., Laspeyers and Paasche price indices, and excludes price movements that tend to be volatile. It is the geometric mean of the Laspeyers and Paasche price indices:

$$F = (L * P)^{1/2}$$

Taking cognisance of the above differences that may arise from either using a Laspeyres or a Paasche price index, deflation in the Compendium is thus done with the Fisher price index which adheres to recommended practice (BEA, 1992: 50-51; UN, 1993: 384). In view of that, this is also the index reported in the Compendium. In the calculation of the index, the Paasche index for each industry is proxied by its price deflator index, which is the percentage ratio of industry value added at current prices to industry value added at constant prices.

4.6 Glossary

This section explains the concepts and definitions considered in the preparation of the Compendium (Table L).

Terms are arranged alphabetically**.**

A single term can have more than one definition, as the concept it may refer to may have different meanings in different statistics.

Table L: Description of concepts

Concept	Description
Account	A depository of information from supply and demand activities resulting from economic decisions at a certain time.
Active enterprise	A unit that is operational in the open market and that has paid value added tax and/or income tax to the Revenue Service at least once.
Activity	A process involving a combination of actions that result in a certain set of products and services.
Administered price	The price of a product, which is set consciously by an individual producer or group of producers and/or any price, which can be determined or influenced by government, either directly, or through one or other government agencies or institutions without reference to market forces.
Advertising	Production of information by firms to help differentiate, and provide information about products to consumers.
Asset	A resource controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity.
Balancing item	The residual obtained by subtracting the total value of entries on one side of an account from the total value of entries on the other side.
Basic price	The amount receivable by the producer from the purchaser for a unit of good or service produced, calculated as output minus any tax payable plus any subsidy receivable on that unit as a consequence of its production or sale. It excludes any transport charges, invoiced separately by the producer. Basic price constitutes the preferred method of output valuation.
Break-up	An event where a legal unit is divided into two or more separate legal units and the original legal unit ceases to exist.
Capital charges	Interest paid on redemption payments for loaned funds.

Table L: Description of concepts (continued)

Capital expenditure	Any expenditure incurred or incidental to the acquisition or improvement of land, buildings, engineering structures and machinery and equipment. It confers a lasting benefit and results in the acquisition of, or extends the life of a fixed or long-term work, irrespective of whether payments are made to outside contractors or concerns, or the work is done by the enterprise itself.
Capital intensity	The quantity of capital used by one unit of labour.
Change in inventories	Change in inventories, including work-in-progress, consists of changes in: (a) stocks of outputs that are still held by the units that produced them prior to them being further processed, sold, delivered to other units or used in other ways; and (b) stocks of products acquired from other units that are intended to be used for intermediate consumption or for resale without further processing. Change in inventories is measured by the value of the entries into inventories less the value of withdrawals and the value of any recurrent losses of goods held in inventories.
Classification standard	Ordering of data by a prescribed or fixed rule. It ensures that information is classified consistently regardless of its collection, source, point of time, etc.
Compensation of employees	The total remuneration, in cash or kind, payable by an employer to an employee in return for work done by the latter during an accounting period. It is recorded on a gross basis, i.e. before any deduction of income taxes, retirement provisions, unemployment insurance and other social insurance schemes. It includes other forms of compensation, namely commissions, tips, bonuses, directors' fees and allowances such as those for holidays and sick leave, as well as military pay and allowances. It excludes employers' social contributions.
Compound annual growth rate	The average annual growth rate in an indicator or variable over a particular period of time.

Table L: Description of concepts (continued)

Concentration	The extent to which a small number of firms in an industry account for a large proportion of its total sales. An industry is said to be concentrated if a few firms make most of its sales.
Concentration index	A metric to identify the absence or presence of concentration in an industry. Its values range between 0 and 1, which respectively describe no concentration (0) or that a single firm makes all the sales (1). The Gini index, Herfindahl index, and Rosenbluth index are examples of concentration indices.
Consumer Price Index (CPI)	A measure of the change over time in the general level of prices of goods and services that a reference population acquires, uses or pays for consuming. It is estimated as a series of summary measures of the period-to-period proportional change in the prices of a fixed set of consumer goods and services of constant quantity and characteristics, acquired, used or paid for by the reference population. Each summary measure is constructed as a weighted average of a large number of aggregate indices. Each of the aggregate indices is estimated using a sample of prices for a defined set of goods and services obtained in, or by residents of, a specific region from a given set of outlets or other sources of consumption for goods and services. The CPI is a Laspeyers/fixed-weight price index.
Consumption	An activity in which institutional units use up goods and services. It can be either intermediate or final.
Consumption of fixed capital	The reduction in the value of fixed assets used in a production process during a given period resulting from physical deterioration, normal obsolescence or normal accidental damage.
Cost of capital	The cost of use of a capital asset for a given period - that is, the price for employing or obtaining capital services. The user cost of capital is also referred to as the “rental price” of a capital good, or the “capital service price".

Table L: Description of concepts (continued)

Current price	The absolute price of a good or service prevailing at a particular period.
Deactivated enterprise	A statistical unit that is dormant, temporarily stopped trading, or is under sequestration.
Dividend	Distribution of profit to holders of equity in proportion to their holding. It is the portion of profits paid to, or earned by a firm's shareholders.
Deflation	The division of the nominal value of some aggregate by a general price index in order to revalue its quantities at the prices of the price reference period or to revalue the aggregate at the general price level of the price reference period.
Economically active person	A person of working age who is available for work and is either employed or is unemployed but takes active steps to find work in a given reference period.
Economic production	An activity carried out under the control and responsibility of an institutional unit that uses inputs of labour, capital, and goods and services to produce outputs of goods.
Economic rent	It represents the excess of total revenue over the opportunity cost of production and depicts the difference between the return made by a factor of production whose supply is fixed, i.e. perfectly inelastic, *and* the return necessary to keep this factor in its current occupation. It is an economic profit if made in a competitive environment.
Economies of scale	Decline in the average cost of production as output increases.
Elasticity of demand	The percentage change in quantity demanded resulting from a percentage change in price. The price elasticity of demand is influenced by consumer incomes, tastes, and the degree to which substitute products exist.
Employee	A person - permanently, temporarily or casually employed - who works upon agreed hours in his job.
Employer	A person or organisation that uses the services of one or more people for payment by cash and/or in-kind.

Table L: Description of concepts (continued)

Employment	An activity in which a person performs work for pay, profit or family gain. Such a person can be self-employed, an employer, an employee or a working family member.
Enterprise	An entity that directly controls all functions necessary to carry out its activities as a producer of goods and services. It may be a corporation, a quasi-corporation, a non-profit institution, or an unincorporated enterprise.
Establishment	An enterprise that engages under a single ownership or control on one or predominantly one kind of activity at a single location.
Expenditure	Consumption, which includes all cash expenditure and in-kind provisions for goods and services incurred by households, business, government, and non-profit institutions. It includes imputed value for own produced items consumed.
Exports	The outward flow of goods and services destined for consumption abroad.
General government	Government units whose primary activity is to assume responsibility for the provision of goods and services to the community or to individual households free of charge or at prices that are not economically significant and to redistribute income and wealth by means of transfers. A defining characteristic of general government is the ability to impose, directly or indirectly, taxes and other compulsory levies.
Gross fixed capital formation	The acquisition value of new and used fixed assets excluding their sales.
Gross operating surplus/mixed income	The surplus generated by operating activities after recompensing labour as factor input to production. It is equivalent to economic rent, or the value of capital service flows from an asset.
Homogeneous production unit	A producer unit in which only a single (non ancillary) productive activity is carried out.

Table L: Description of concepts (continued)

Horizontal integration of enterprise unit	A combination of two or more businesses within the same group or company structure operating together on the market as one unit.
Formal sector	All employing businesses that are legally registered in any way.
Human capital	All the skills, knowledge and expertise that a workforce accumulates over time to allow it to increase industry productivity.
Imputation	The assignment of replacement values for missing, invalid or inconsistent data by way of informed estimation following a process of prescribed guidelines.
Implied/implicit deflator	An implied deflator is a Paasche price index that is a by-product of deflation. It represents an index of the general price level that is obtained by dividing a series expressed in current prices by the corresponding series in constant prices. An implicit deflator is sometimes referred to as a “current weighted index”.
Imports	The inward flow of goods and services destined as part of home supply.
Income of business	All money received from sales of goods, services rendered, mineral rights leases, rental of land, buildings and other structures, plant, machinery, and motor vehicles, interest and dividends, royalties, franchise fees, copyright, trade names and patent rights, government subsidies and incentives, net profit on foreign loans, profit from redemption, liquidation or revaluation of liabilities, and profit from the sale of realisation for cash or revaluation.
Industry	Group of establishments engaged in the same or similar kinds of activity based on the principal class of goods produced or services rendered.

Table L: Description of concepts (continued)

Income of individual	All money received from salary, wages or own business; plus money benefits from employer, such as contributions to medical aid and pension funds; plus all money from other sources, such as additional work activities, remittances from family members living elsewhere, state pension or grant, other pensions or grants, income from investments, etc.
Industry size	Denotes the magnitude of an industry with reference to total industry output, or other measures of economic activity such as total assets, sales revenue/turnover, and employment.
Industrial activity	An economic activity resulting in a homogeneous set of products or the same kind of services.
Inflation	The percentage increase in the level of a general price index from one period to another.
Institutional sector	An aggregation of institutional units on the basis of the type of producer depending on their principal activity and function, which are considered to be indicative of their economic behaviour. Institutional units are grouped together to form institutional sectors on the basis of their principal functions, behaviour, and objectives.
Intermediate consumption	The value of goods and services consumed as inputs by a process of production excluding fixed assets whose consumption is recorded as consumption of fixed capital. The goods or services may either be transformed or used up by the production process.
Interest	The cost or price of borrowing, or the gain from lending. The former denotes interest paid, and the latter interest received.
Laspeyers index	A form of index number where prices, quantities or other units of measurement over time are weighted according to their values in a specified base period. It is also called a “base weighted index”.

Table L: Description of concepts (continued)

Liability	An obligation that requires one unit (the debtor) to make a payment or a series of payments to the other unit (the creditor) in certain circumstances specified in a contract between them.
Life cycle of statistical unit	A series of states in the life of a statistical unit that can take the following stages: “birthed”, “activated”, “deactivated”, “reactivated” or “ceased”.
Manufacturing	The physical or chemical transformation of materials of components into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker's home, and whether the products are sold at wholesale or retail. Included are assembly of component parts of manufactured products and recycling of waste materials.
Marginal cost	The increment or addition to total cost that results from producing one more unit of output.
Market share	The proportion a firm holds in an industry. It is derived according to total sales, capacity, or any other measure of industry size.
Merger	An event where two or more businesses are joined and a new business is registered. The registered name of the new business may be different from the registered name of all the original businesses. The original businesses are ceased.
Occupation	The type of work a person does.
Opportunity cost	The amount lost by not using an asset or resource in its best alternative use.
Output	Goods or services that are produced within an establishment that become available for use outside the establishment, plus any goods and services produced for own final use.
Overtime	Hours worked in excess of ordinary time as per standard or agreed hours.

Table L: Description of concepts (continued)

Ownership of business	The manner in which a business is managed and controlled. Examples include, sole proprietorship, partnership, corporation and business trust.
Paasche index	A form of index number where prices, quantities or other units of measurement over time are weighted according to their current period values. It is also called a "current weighted index".
Principal activity	The activity whose gross value added exceeds that of any other activity carried out within the same unit/enterprise.
Producer Price Index (PPI)	A measure of the change in the prices of goods and services either as they leave their place of production or as they enter the production process. The PPI is designed to measure the average change (between periods) in output prices due to changes in the basic prices received by producers or, alternatively, the change in prices paid by producers for inputs of goods and services used in the production of output. The PPI is a Laspeyers (fixed-weight) price index.
Production	An activity resulting in a product. A process without any human involvement or direction is not production in an economic sense.
Productivity	The ability to transform inputs into output.
Purchases	Tangible items purchased by an entity primarily with the intention of selling them to customers. Purchases include: raw materials, components used in production, fuels for off-road vehicles, spare parts and building materials; and purchases and transfers-in of factored goods, intermediate products and partially completed goods from related enterprises.
Rate of return	Realized earnings from invested capital. It shows how much is earned per Rand of invested capital.
Reactivated	Life status of a statistical unit which has restarted its operations.
Real price	The absolute price of a good or service relative to an aggregate measure of prices.

Table L: Description of concepts (continued)

Real value	The value of a variable expressed in real prices. It is obtained by deflating the value in nominal/current prices with a general price index. When this deflation is fixed to a particular year the real price is called constant price and the resultant real values are in constant prices. *See* volume index.
Re-exports	Foreign goods exported in the same state as previously imported
Replacement cost	The long-run cost of buying a comparable quality asset.
R&D expenditure	Intramural current expenditure, including overheads, and intramural capital expenditure spent on creative work undertaken on a systematic basis to increase the stock of knowledge and the use of this knowledge to devise new applications.
Reserves	The amount set aside out of surpluses, which is not designed to meet any liability, contingency, commitment or diminution in the value of assets.
Revaluation	An increase or decrease in the value of a currency, or of fixed assets, typically freehold land and buildings, that depicts resultant gains or losses.
Sales	The total value of earnings and transfers-out of all own manufactured products and the amounts received for installation, erection, assembly or other services rendered.
Sampling	Drawing out from a population in such a way that the drawn out sample is representative of the population.
Secondary industries	Comprise the manufacturing, electricity, water and construction industries.
Standard Industrial Classification of all Economic Activities	System that classifies businesses according to their economic activities.
Statistical unit	A unit of observation or measurement for which statistical data are collected or derived

Table L: Description of concepts (continued)

Subsidies	Current unrequited payments that government units, including non-resident government units, make to enterprises on the basis of the levels of their production activities or the quantities or values of the goods or services which they produce, sell or import. These transfers represent additions to the income of enterprises.
Substitution effect	The switch in spending under a constant purchasing power to or from a product when its relative price changes in relation to its replacement.
Takeover	An event where one or more business is absorbed by another business or businesses.
Tax	A compulsory transfer of money or occasionally of goods and services from individuals, institutions or groups to the State.
Technology	The knowledge about available techniques depicting the combination of factors used to produce goods and services. A technique is characterized in terms of capital intensity.
Trading gain or loss	The real gain from foreign trade. It can be derived in one of two ways: (a) as the difference between real gross domestic income and real gross domestic product; or (b) by subtracting the value of imports from the value of exports after deflation. Where there is uncertainty about the choice of deflator, an average of the import and the export price indices provides a suitable deflator.
Transfer	A transaction in which one institutional unit provides goods, services or assets to another unit without receiving from the latter any goods, services or assets in return as counterpart.
Transfer in-kind	The transfer of the ownership of a good or an asset other than cash, or the provision of a service.
Value added	Those activities or steps which add to or change a product or service as it goes through a process; these are the activities or steps that customers view as important and necessary.

Table L: Description of concepts (concluded)

Vertical integration of economic activities	The case where the different stages of production are carried out in succession by the same unit and where the output of one process serves as input to the next.
Vertical integration of enterprise unit	A combination of enterprise units that are operating in such a way that the production of one enterprise is consumed totally by another enterprise within the same group or company structure.
Volume index	An index that describes changes in volume. It is obtained when price change is removed from a nominal value by means of deflation through a general price index. To get to a volume index the nominal value is divided by a price index and the obtained quotient is multiplied by one hundred. A volume index can also be produced directly from quantity data without deflation with a price index. With a Paasche price index as deflator, a Laspeyers-type volume index is derived. With a Laspeyers price index as deflator, a Paasche-type volume index is derived. Both isolate changes in price differently. The former captures changes in quantity by holding prices constant to a past period. The latter captures changes in quantity by holding prices constant to a current period.

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