



Information and Communications Technologies (ICT)

Statistical Review 1993 - 1998

July 2000

Spectrum, Information Technologies and Telecommunications Sector

Industry Canada

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- ICT trade analysis
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INFORMATION AND COMMUNICATIONS TECHNOLOGIES STATISTICAL REVIEW (ICTSR): 1990 - 1998

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based on work carried out under the auspices of
Industry Canada and Statistics Canada

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The ICTSO, the ICTSR and other related documents
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Note to Readers

Industry Canada is pleased to provide this new edition of the Information and Communications Technologies Statistical Review (ICTSR), which reports the 1998 statistics for the Canadian Information and Communications Technologies (ICT) sector. Regular readers of the ICTSR will notice that this new edition has been shortened. Since most readers are only interested in aggregated information, Industry Canada has decided to publish a shorter version of the ICTSR which excludes the detailed industry tables (sections 6 and 7 of last year's edition) and the appendix providing sector and industry definitions.

The ICTSR is now complemented with the new Information and Communications Technologies Statistical Overview (ICTSO) web site which provides all the information that has been removed from the ICTSR (detailed industry tables and all the appendix) and more. The ICTSO is updated on a regular basis and provides the latest data available (including 1999 trade, GDP and R&D data) on the ICT sector, detailed industry tables, new charts, historical data and related reports.

Progress in measuring the ICT Sector

Industry Canada continues to work closely with Statistics Canada, other federal departments, the industry itself, and international organizations such as the Organization for Economic Cooperation and Development (OECD), to develop and improve statistics for the ICT sector. Progress has been achieved over the last five years through agreements between Industry Canada and Statistics Canada to revise current surveys and data sources associated with ICT and to introduce new surveys.

As reported in last year's edition of the ICTSR, countries within the OECD reached an important consensus in 1998 on a definition of the ICT sector based on the international standard industrial classification (ISIC), revision 3 (rev. 3). Statistics Canada has developed concordances to the Canadian 1980 Standard Industrial Classification (SIC) and the North American Industry Classification System (NAICS). As last year, the OECD definition of the ICT sector is used for this edition of the ICTSR.

For further details on the OECD definition of the sector and the concordances, consult "*Defining the Information and Communication Technology Sector*", as well as "*Statistics Canada SIC Definitions*" for the full description of the ICT industries. These documents are available on the Information and Communications Technologies Statistical Overview (ICTSO) web site.

Reporting on the ICT sector will continue to evolve as the 1997 North American Industry Classification System (NAICS) is implemented. Consult "*Statistics Canada North American Industry Classification System*" on the ICTSO web site for the full description of the ICT industries based on NAICS.

Changes in methodology

Employment in the software and computer services industry

One data source was changed in order to harmonize the reporting unit for all the ICT industries. The standard reporting unit for the ICTSR is the establishment (as opposed to the enterprise¹) and, as much as possible, establishment-level data are used. Therefore, the data source for the number of employees in the software and computer services industry is now the Annual Survey of Computer Services, replacing the Labour Force Survey (LFS). The Annual Survey of Computer Services provides estimates of the number of employees based on data collected at the establishment-level whereas the LFS is a household-based survey. The LFS is still used for the number of contract workers (self-employed) since it is the only survey providing estimates of the number of self-employed, a common form of employment in this industry. All employment data for previous years have been revised to allow comparisons with 1998.

GDP for the ICT wholesaling industries

Since Statistics Canada does not report GDP figures for the ICT wholesaling industries, last year's edition of the ICTSR contained Industry Canada estimates for these industries. This year, in order to harmonize the data reported in this document with future Statistics Canada publications on the ICT sector, Industry Canada no longer estimates the GDP for the ICT wholesaling industries. As a result, aggregated figures for the ICT sector reported in this edition are not comparable with data published in last year's edition of the ICTSR. However, all aggregated GDP data for previous years have been revised to allow comparisons with the 1998 data.

Important Note

Due to the above-mentioned changes to this year's ICTSR, it is not advisable to compare data with last year's edition. Reference data from 1993 to 1997 have all been recalculated in this document using data sources described above. This edition also includes revisions made by Statistics Canada to data previously published. In addition, this publication provides, as in previous editions, estimates by Industry Canada, which are underlined in the document. Please see sources and technical notes for further details and the Information and Communications Technologies Statistical Overview (ICTSO) web site for historical data back to 1990.

¹Statistics Canada collects data for two different statistical units, namely the establishment and the enterprise. The establishment is the smallest operating unit in a business capable of reporting specified input and output data. The enterprise is a family of businesses under common ownership and control for which a set of consolidated financial statements is produced. Enterprises with complex organizational structures (those which are larger and more diverse) usually have more than one establishment.

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Highlights

HIGHLIGHTS

CANADA'S INFORMATION AND COMMUNICATIONS TECHNOLOGIES SECTOR - 1998 SIGNIFICANT ACHIEVEMENTS

Sector Definition

As last year, Industry Canada is using the OECD definition for the Information and Communications Technologies (ICT) sector which comprises the following:

ICT Manufacturing

consumer electronics
communication and telecommunication equipment
electronic components
computer equipment
communications wires and cables
instrumentation

ICT Services

cable television
telecommunications services
ICT wholesaling
software and computer services
office machinery and equipment rental and leasing

Canada's Information and Communications Technologies sector continued to show a surge in 1998 and most industries showed substantial increases. The highlights between 1997 and 1998 are:

The creation of **33,990 new jobs** for Canadians

A **14.4% increase** brought ICT **revenues** to \$116.4 billion

A **11.5% increase** in ICT's contribution to **GDP** - ICT accounted for **4.9% of total Canadian GDP** in 1998

A **12.0% increase** in ICT **research and development** - ICT R&D accounts for **46% of total Canadian private sector R&D**

A **8.0% increase** in ICT **exports**, bringing the total to \$28.6 billion and **8.3% of total Canadian exports**

Revenues

- C ICT revenues reached \$116.4 billion in 1998, an increase of 14.4% from 1997.
- C Services accounted for 73% of all ICT revenues, with wholesaling activities making up one-third of total revenues and telecommunications services another 25% in 1998.
- C Revenues for the entire ICT sector have grown at a compound annual growth rate (CAGR) of 11.1% for the 1993-1998 period.
- C During 1998, the software and computer services industry and the electronic parts and components industry showed the strongest increases, with growth rates of 20.0% and 16.3% respectively. The telecommunication equipment industry showed the strongest growth over the 1993-1998 period with a CAGR of 13.8%.

Employment

- C Total employment in the ICT sector reached 512,018¹ in 1998, a net increase of 7.1% or 33,990 more jobs from the previous year. This growth is 2.5 times faster than the growth observed at the national level (2.8%).
- C Over the period 1993-1998, employment in the sector grew at a CAGR of 5.7% compared to 1.9% in the Canadian economy.
- C The number of people working in the ICT services industries was 406,085, representing 79.3% of total ICT sector in 1998. This includes 65,100 self-employed working in the software and computer services industry. See the *Note to Readers* for more details regarding employment in the software and computer services industry and the inclusion of self-employed.
- C Between 1997 and 1998, the largest increase in employment was in the software and computer services industry, with more than 27,000 new jobs, representing an expansion of 16.9%. Total employment in this industry reached 189,583 in 1998.

¹ Includes employees and self employed.

Gross Domestic Product (at factor cost)

- C The ICT sector contribution to the Canadian GDP in 1998 was \$35.6 billion² (in 1992 constant dollars). This represents an increase of 11.5% from 1997 compared to 2.9% for the overall Canadian GDP.
- C This strong growth of the ICT sector during 1998 also means that 18.2% of the entire growth of the Canadian GDP between 1997 and 1998 was generated by the ICT sector.
- C Over the period 1993-1998, the GDP in the ICT sector grew at a CAGR of 7.9% compared to 3.1% for the Canadian economy. As a result, the ICT sector share of the Canadian GDP grew from 3.9% to 4.9% during this period.
- C Telecommunications services is the ICT industry with the largest contribution to the Canadian GDP at \$15.7 billion (in 1992 constant dollars), representing 44% of the ICT sector's GDP.

Research and Development

- C The ICT sector is the largest R&D performer in the Canadian economy. In 1998, total R&D expenditures in the ICT sector were \$4.2 billion (an increase of 12.0% from 1997). This represents almost 46% of total Canadian private sector R&D.
- C With total R&D expenditures of \$2.1 billion in 1998, the telecommunication equipment industry accounted for almost 50% of all R&D expenditures in the ICT sector and 22.7% of total Canadian private sector R&D.
- C From 1993 to 1998, R&D expenditures in the ICT sector grew at a CAGR of 10.9% compared to 7.2% in the Canadian private sector and 4.7% in non-ICT industries.

² Do not include ICT wholesaling industries.

Trade

- C Exports of ICT goods and services increased by 8.0% in 1998, reaching \$28.6 billion. This represents 8.3% of total Canadian exports³.
- C Imports reached \$48.9 billion in 1998, up 9.1% from 1997, representing 15.0% of total Canadian imports⁴.
- C The resulting trade deficit reached \$20.3 billion, an increase of 10.8% from 1997.
- C Goods account for 87.6% of ICT exports and 93.8% of ICT imports.
- C Manufacturing exports were up 7.1% in 1998 reaching \$25.1 billion. This represents 7.9% of total Canadian manufacturing exports.
- C The electronic computing and peripheral equipment industry represented the largest proportion (24.7%) of ICT exports with \$7.1 billion in 1998.
- C Manufacturing imports reached \$45.9 billion in 1998, an increase of 8.7% from 1997. They represented 15.4% of total Canadian manufacturing imports in 1998.
- C Imports of electronic parts and components reached \$15.4 billion in 1998, representing 31.5% of total ICT imports.
- C The manufacturing trade deficit reached \$20.8 billion in 1998, an increase of 10.8% from 1997. The electronic parts and components industry accounted for 46% of this trade deficit and 48% of the growth occurring between 1997 and 1998.
- C With a trade surplus of \$2.1 billion in 1998, the telecommunication equipment industry is the only ICT manufacturing industry consistently running a trade surplus over the 1993-1998 period.
- C In 1998, Canada had a trade surplus of \$604 million in computer services and a trade deficit of \$112 million in communications services. This resulted in an overall trade surplus for ICT services of \$492 million, up 9.3% from 1997.

³ Canadian exports are defined as the sum of manufacturing exports and receipts for commercial services sold to clients located abroad.

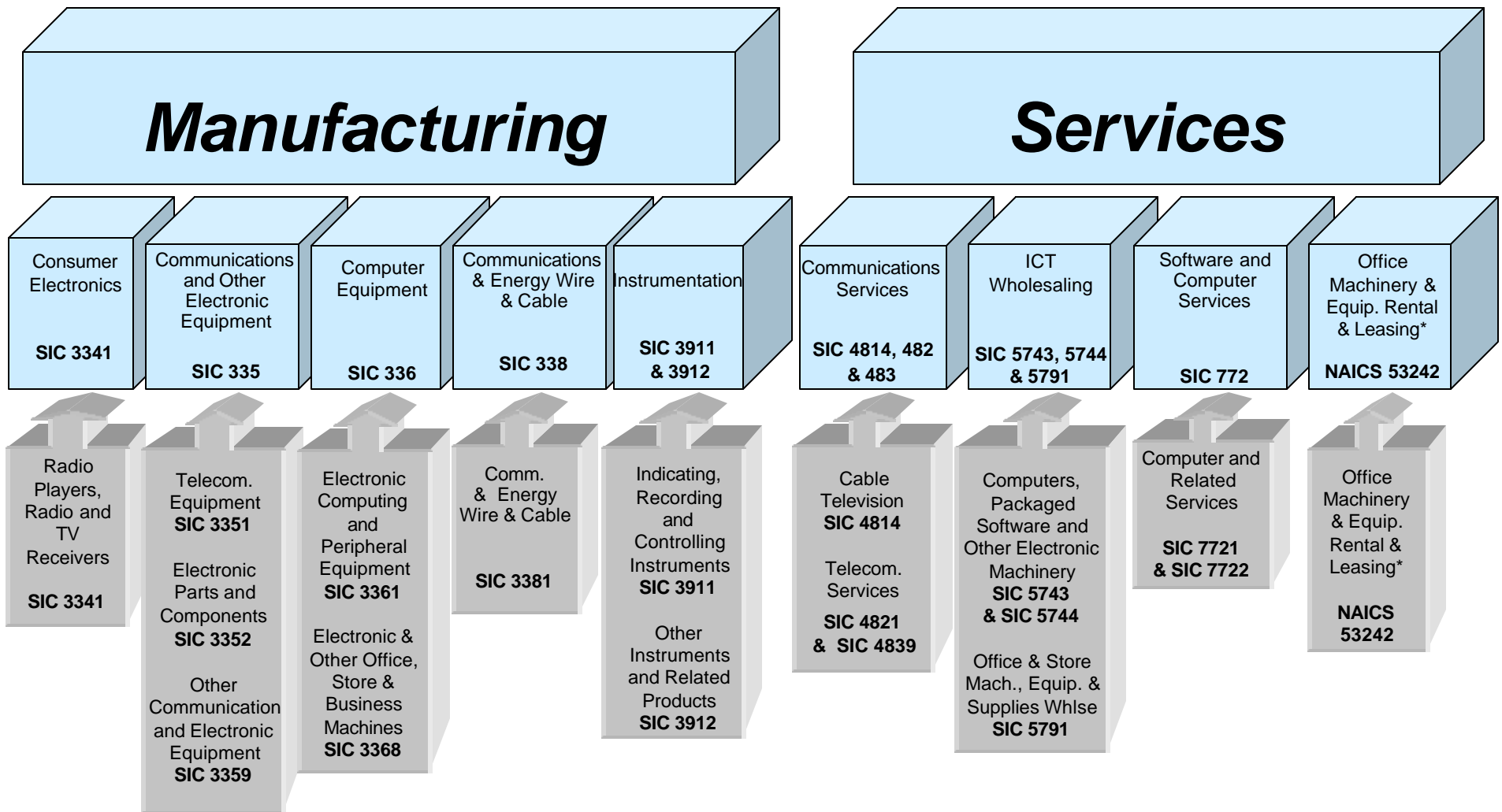
⁴ Canadian imports are defined as the sum of manufacturing imports and payments for commercial services bought from abroad.

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Section 1

Legend

Information and Communications Technologies Legend

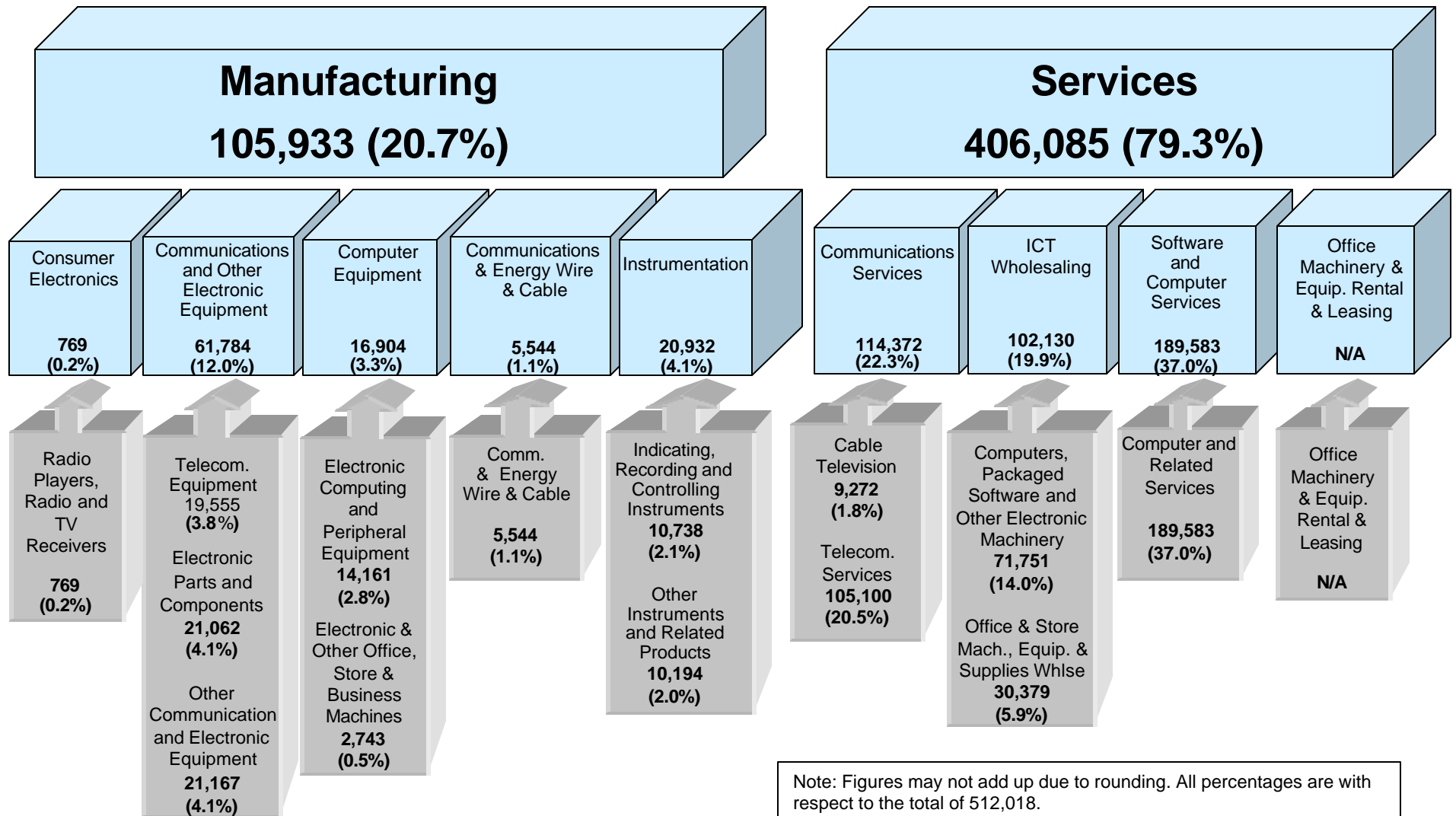


* Data for SIC 9913 is not available anymore.

Section 2
ICT Sector: 1998 at a Glance

Information and Communications Technologies

Figure 1 - 1998 Employment: 512,018



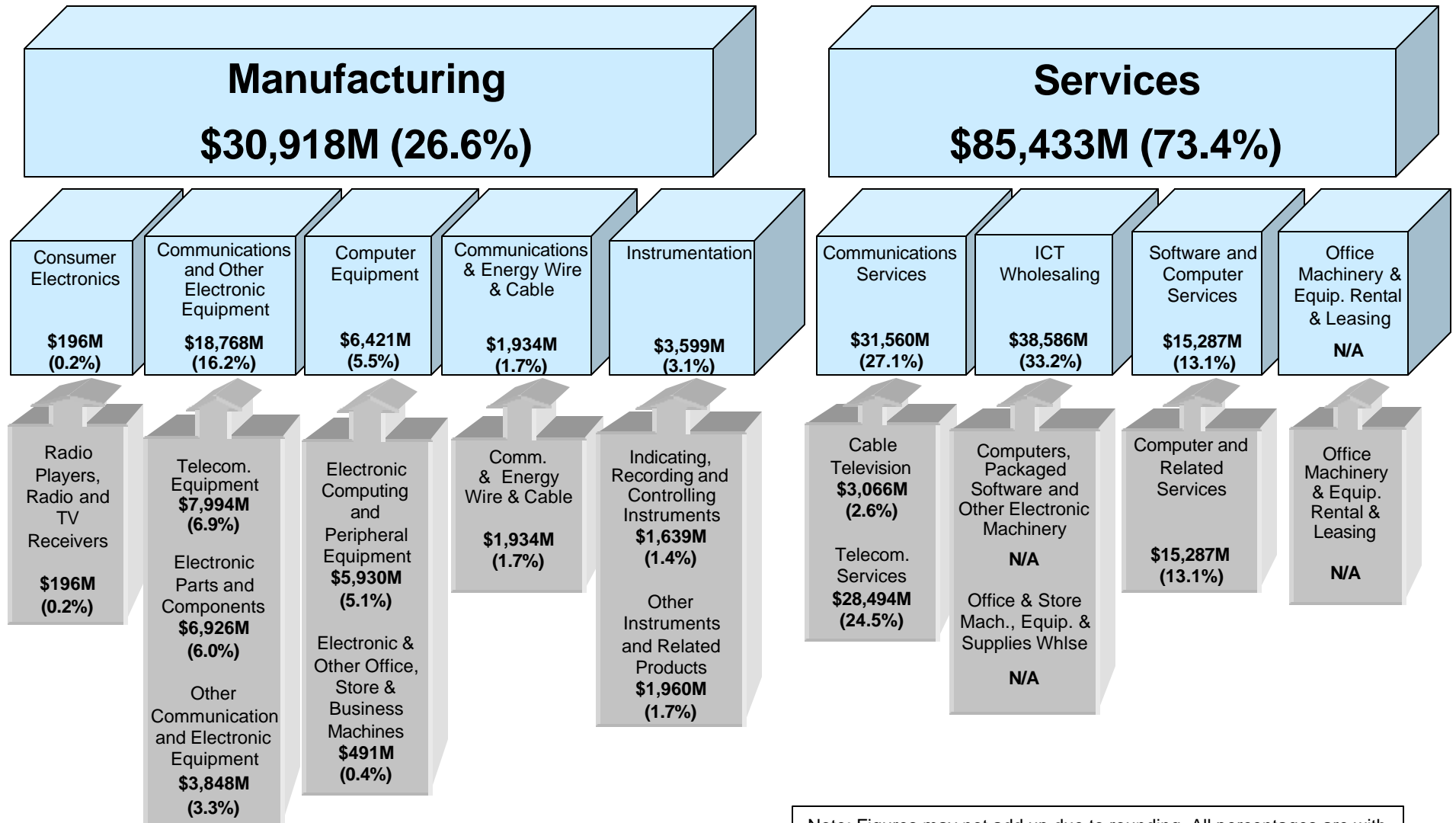
Note: Figures may not add up due to rounding. All percentages are with respect to the total of 512,018.

Source: Industry Canada estimates based on Statistics Canada data.

See Sources and Technical Notes for more details.

Information and Communications Technologies

Figure 2 - 1998 Revenue: \$116.4 billion



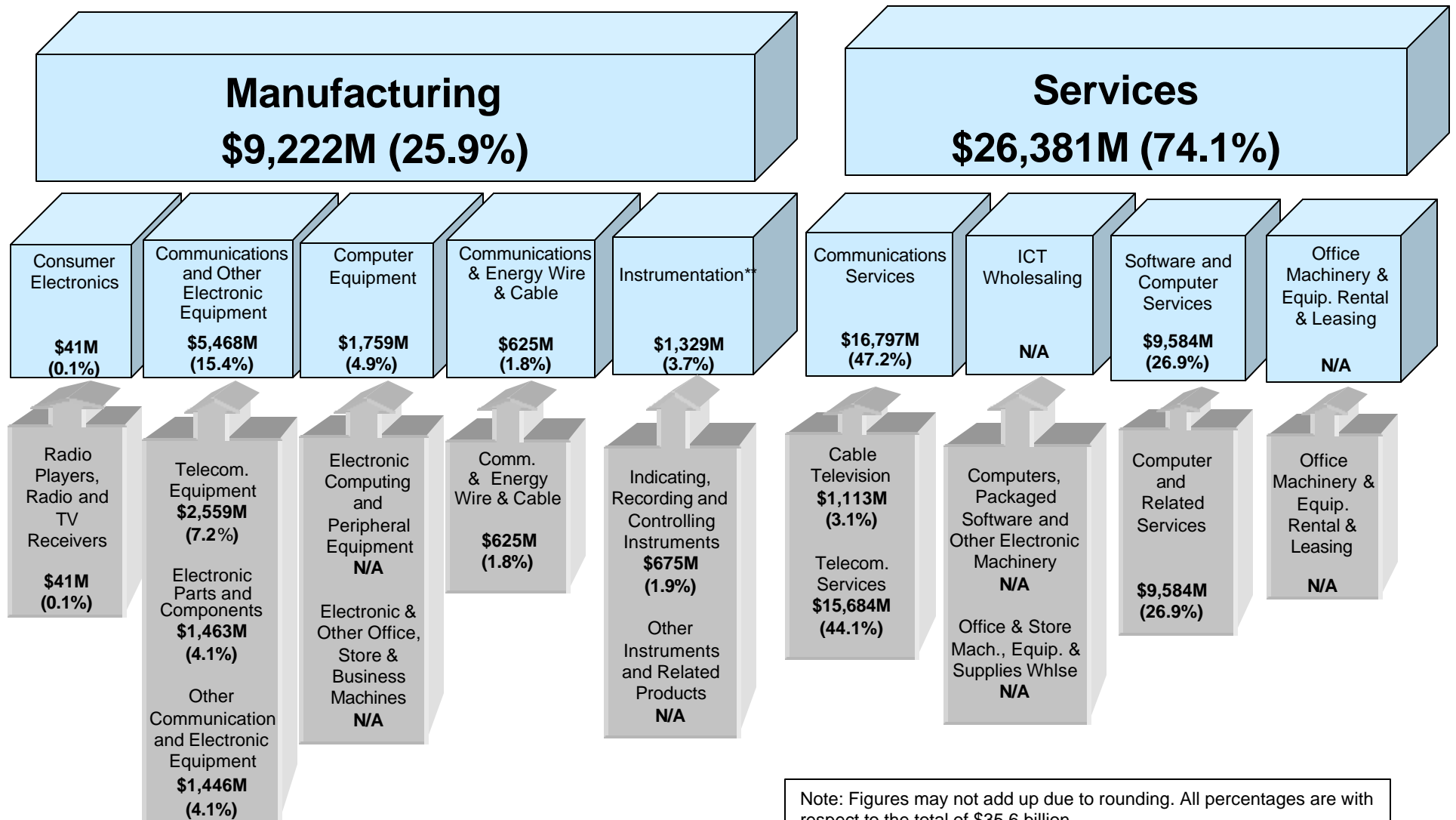
Note: Figures may not add up due to rounding. All percentages are with respect to the total of \$116.4 billion.

Source: Industry Canada estimates based on Statistics Canada data.

See Sources and Technical Notes for more details.

Information and Communications Technologies

Figure 3 - 1998 GDP: \$35.6 billion* (in 1992 dollars)



Note: Figures may not add up due to rounding. All percentages are with respect to the total of \$35.6 billion.

Source: Statistics Canada.

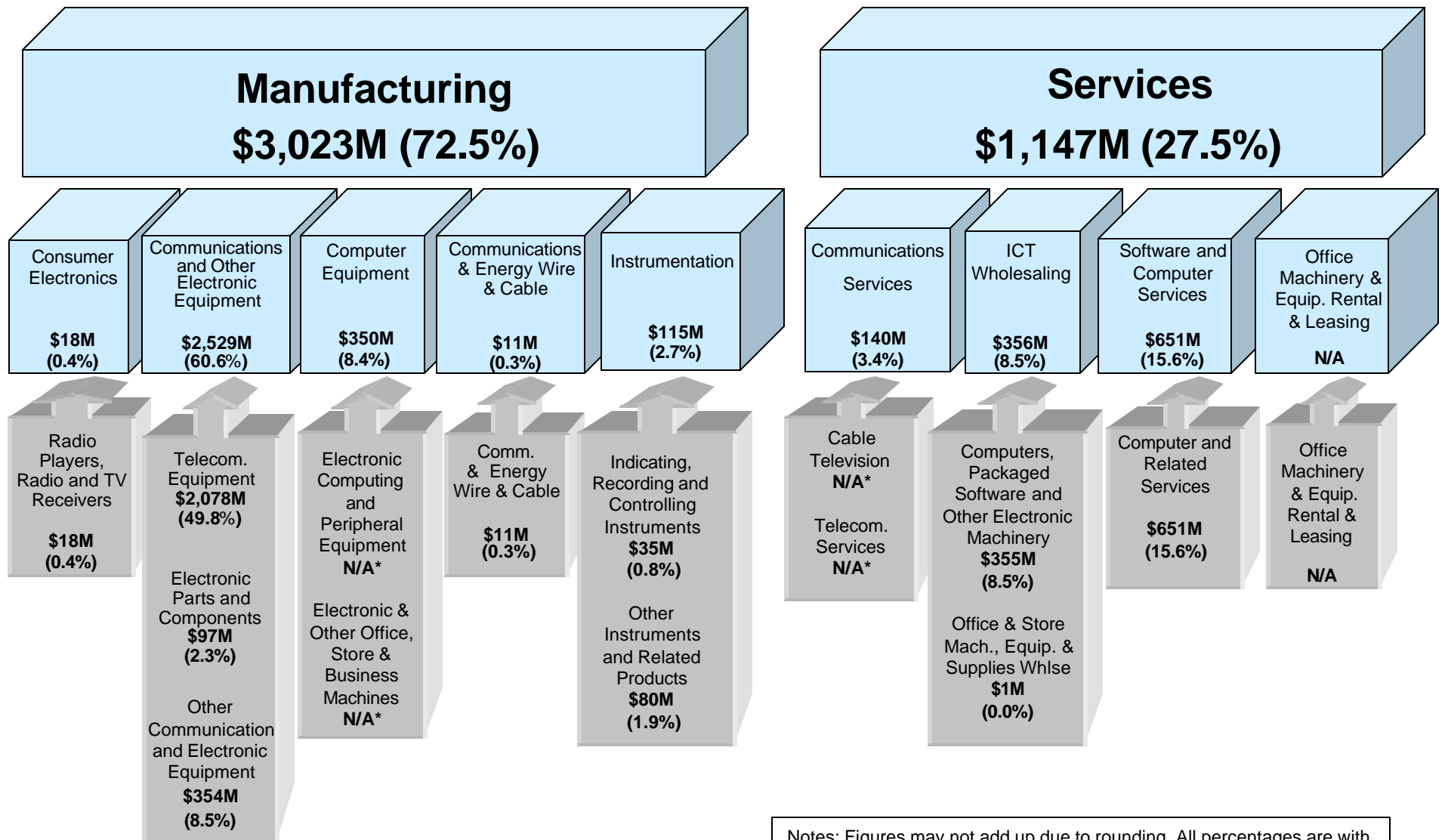
See Sources and Technical Notes for more details.

* Do not include ICT wholesaling.

** Somewhat overstated due to the inclusion of SIC 3913 and 3914.

Information and Communications Technologies

Figure 4 - 1998 R&D: \$4.2 billion



* Electronic computing and peripheral equipment and Other office, store and business machines as well as Telecommunications services and Cable television have been combined to maintain confidentiality among respondents.

Notes: Figures may not add up due to rounding. All percentages are with respect to the total of \$4.2 billion.

Source: Statistics Canada.

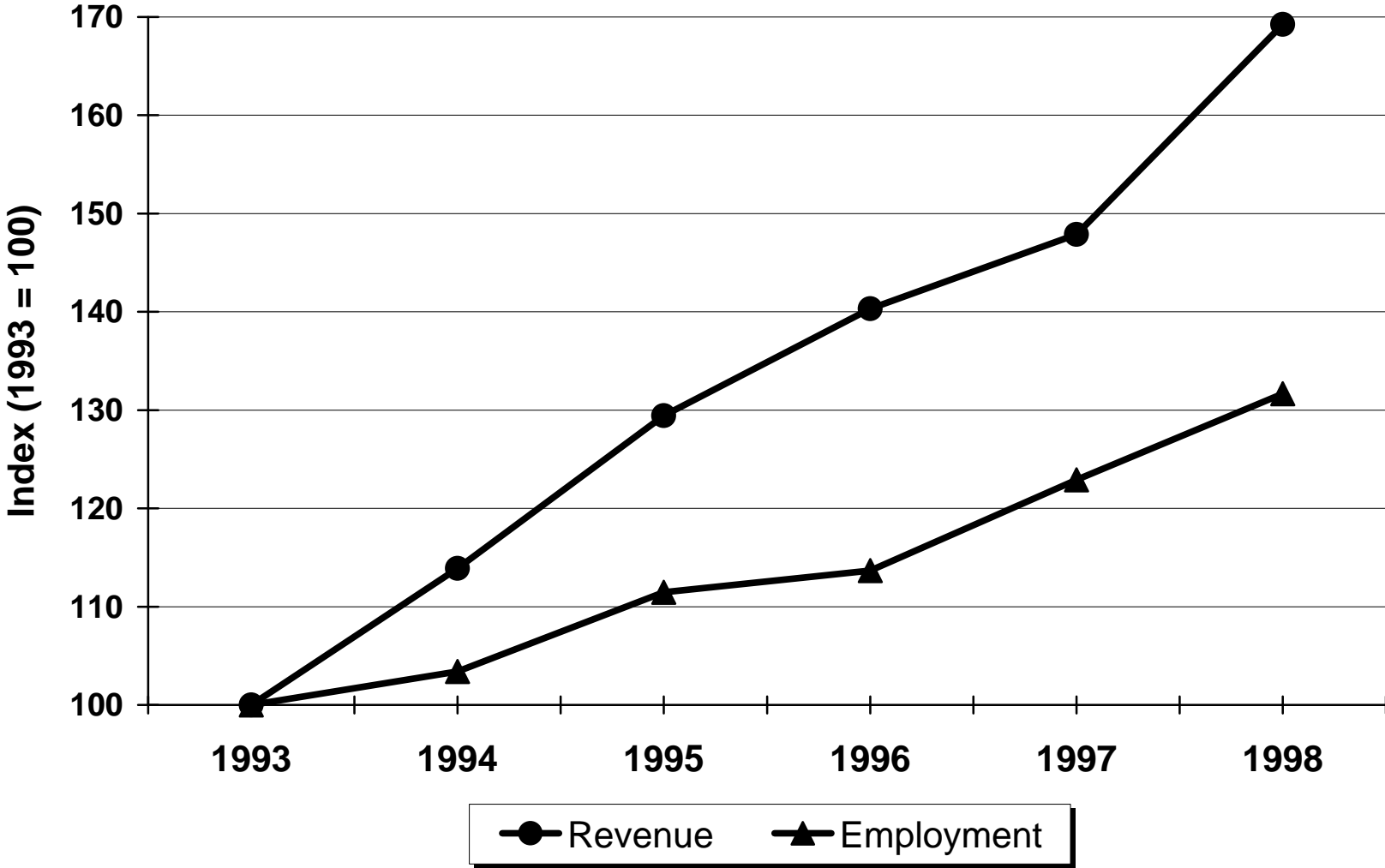
See Sources and Technical Notes for more details.

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Section 3
Trends in the ICT Sector:
1993 - 1998

Figure 5

**Total ICT Sector: 1993-1998
(Manufacturing and Services)
Indexed Growth in Revenue and Employment**



Sources: Various sources. See Sources and Technical Notes for more details.

Figure 6

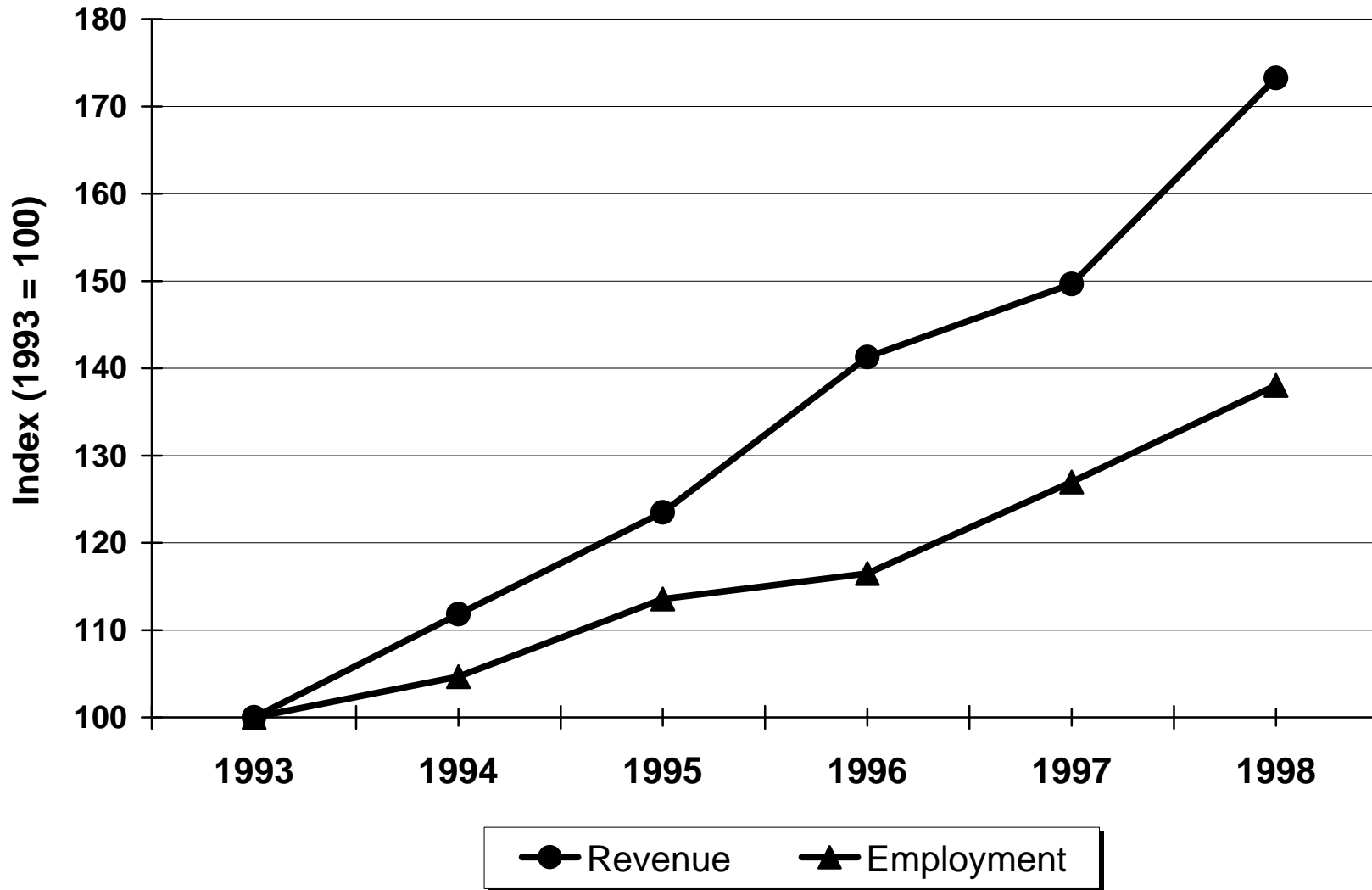
**ICT Manufacturing: 1993-1998
Indexed Growth in Revenue and Employment**



Sources: Various sources. See Sources and Technical Notes for more details.

Figure 7

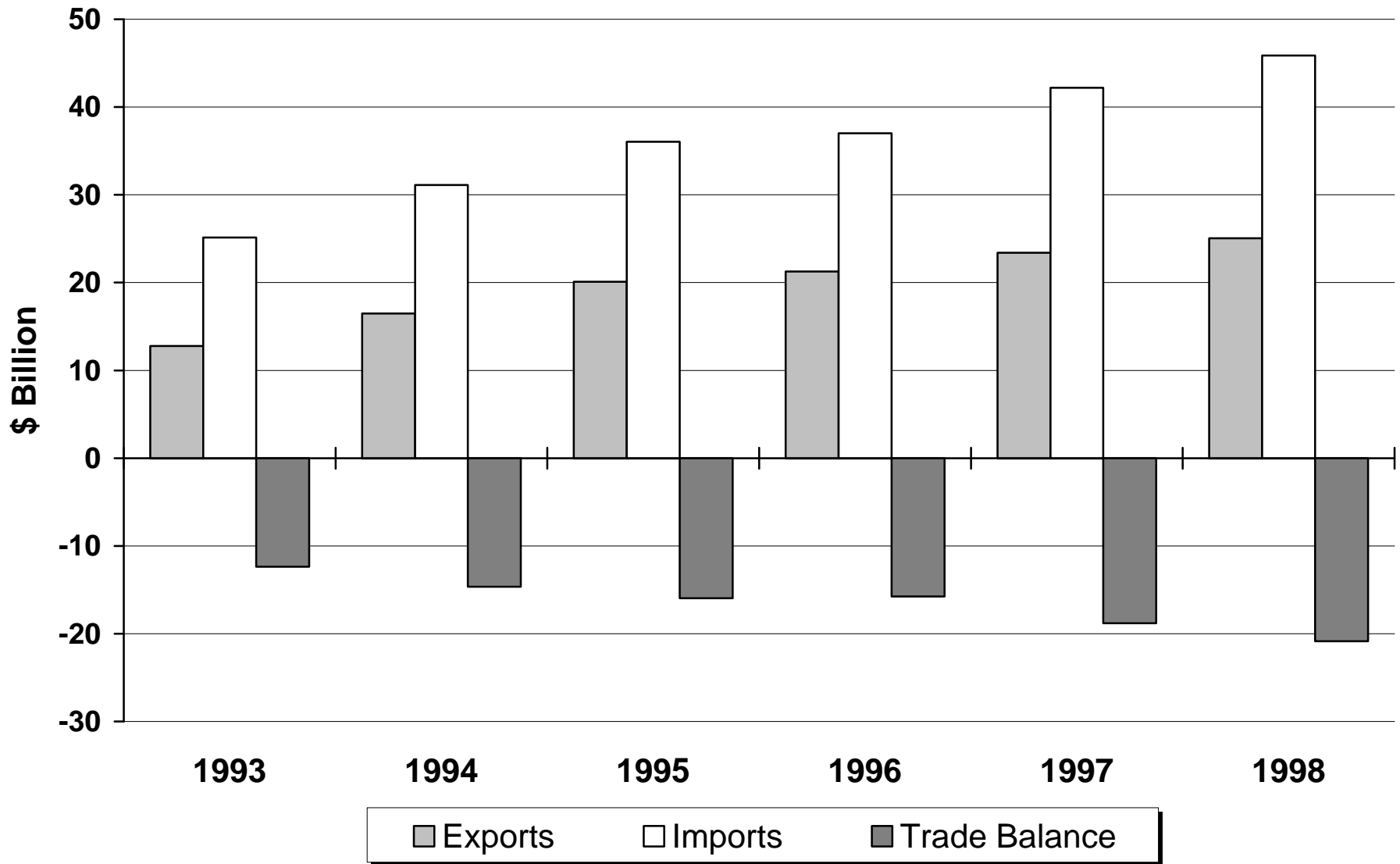
ICT Services: 1993-1998
Indexed Growth in Revenue and Employment



Sources: Various sources. See Sources and Technical Notes for more details.

Figure 8

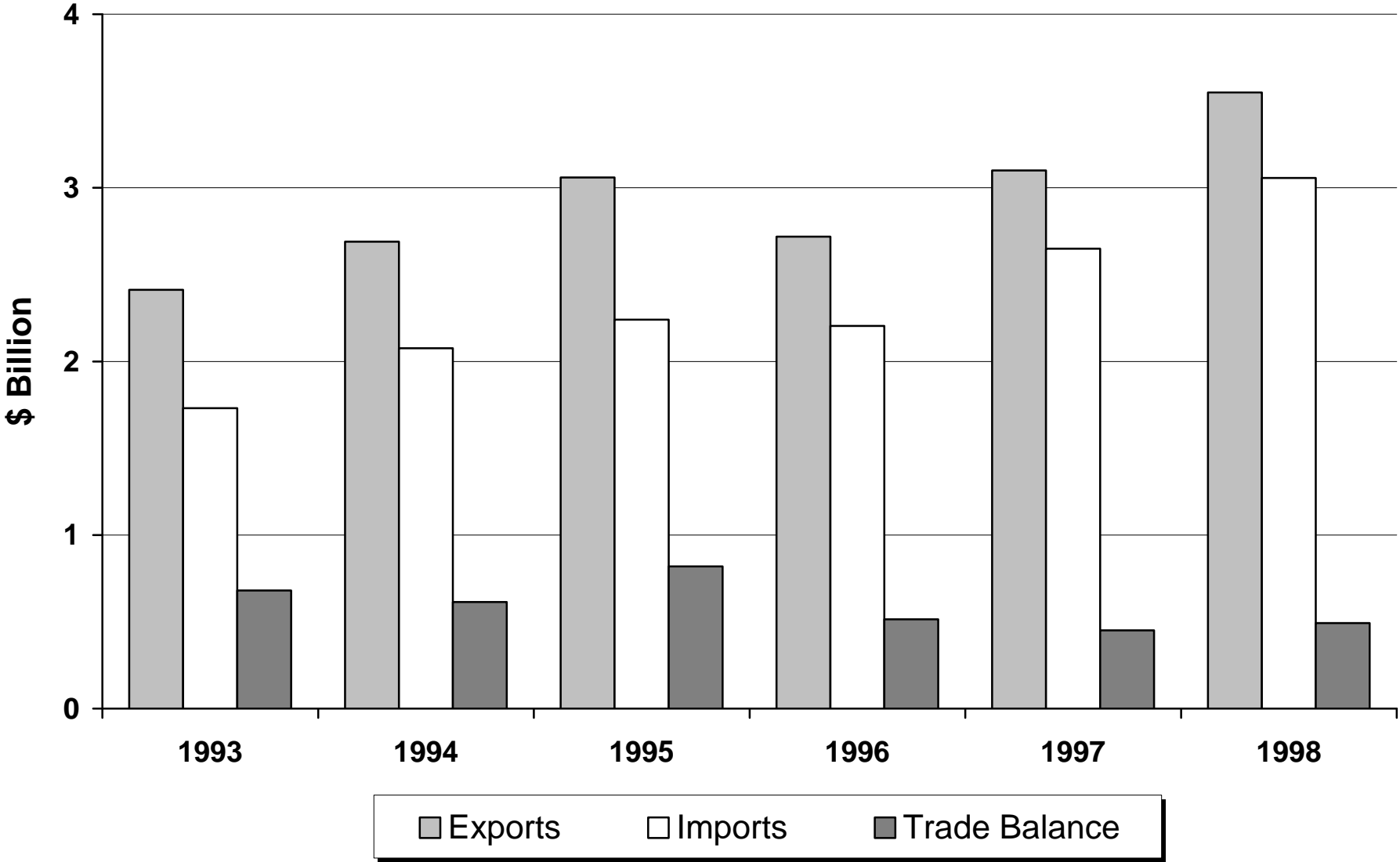
**ICT Manufacturing: 1993-1998
Total Exports, Imports and Trade Balance**



Sources: Various sources. See Sources and Technical Notes for more details.

Figure 9

ICT Services: 1993-1998
Exports, Imports and Trade Balance



Sources: Various sources. See Sources and Technical Notes for more details.

Section 4
ICT Sector Aggregate Statistics:
1993 - 1998

**Total ICT Sector
Aggregate Statistics: 1993 - 1998**

<i>Employment</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% change 1997-1998</i>	<i>% change 1993-1998</i>	<i>CAGR 1993-1998</i>
ICT Manufacturing	94,728	94,198	99,381	99,418	104,504	<u>105,933</u>	<u>1.4%</u>	<u>11.8%</u>	<u>2.3%</u>
ICT Services*	<u>294,181</u>	<u>307,901</u>	<u>334,076</u>	<u>342,637</u>	<u>373,524</u>	<u>406,085</u>	<u>8.7%</u>	<u>38.0%</u>	<u>6.7%</u>
Total ICT Sector*	<u>388,909</u>	<u>402,099</u>	<u>433,457</u>	<u>442,055</u>	<u>478,028</u>	<u>512,018</u>	<u>7.1%</u>	<u>31.7%</u>	<u>5.7%</u>

<i>Revenues (\$'000)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% change 1997-1998</i>	<i>% change 1993-1998</i>	<i>CAGR 1993-1998</i>
ICT Manufacturing	19,438,636	23,167,882	28,094,542	26,802,818	27,886,608	<u>30,918,863</u>	<u>10.9%</u>	<u>59.1%</u>	<u>9.7%</u>
ICT Services**	49,307,505	55,128,378	60,886,355	69,658,413	73,779,960	<u>85,432,696</u>	<u>15.8%</u>	<u>73.3%</u>	<u>11.6%</u>
Total ICT Sector**	<u>68,746,141</u>	<u>78,296,260</u>	<u>88,980,897</u>	<u>96,461,231</u>	<u>101,666,568</u>	<u>116,351,559</u>	<u>14.4%</u>	<u>69.2%</u>	<u>11.1%</u>

<i>Gross Domestic Product (GDP) (\$'000 - 1992 constant \$)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% change 1997-1998</i>	<i>% change 1993-1998</i>	<i>CAGR 1993-1998</i>
ICT Manufacturing	6,104,000	6,781,000	7,803,000	7,341,000	8,221,000	9,222,000	12.2%	51.1%	8.6%
ICT Services***	18,189,000	19,598,000	20,950,000	21,833,000	23,706,000	26,381,000	11.3%	45.0%	7.7%
Total ICT Sector***	<u>24,293,000</u>	<u>26,379,000</u>	<u>28,753,000</u>	<u>29,174,000</u>	<u>31,927,000</u>	<u>35,603,000</u>	<u>11.5%</u>	<u>46.6%</u>	<u>7.9%</u>

<i>Research and Development (R&D) (\$'000)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% change 1997-1998</i>	<i>% change 1993-1998</i>	<i>CAGR 1993-1998</i>
ICT Manufacturing	1,768,427	2,066,690	2,257,322	2,379,209	2,669,344	3,022,877	13.2%	70.9%	11.3%
ICT Services	722,971	966,669	1,004,672	1,001,800	1,053,619	1,147,396	8.9%	58.7%	9.7%
Total ICT Sector	<u>2,491,398</u>	<u>3,033,359</u>	<u>3,261,994</u>	<u>3,381,009</u>	<u>3,722,963</u>	<u>4,170,273</u>	<u>12.0%</u>	<u>67.4%</u>	<u>10.9%</u>

* Including self-employed. Survey methodology changed in 1997, data are not strictly comparable to data for previous years.

** Due to methodological changes in Telecom. Services and Software and Computer Services industries, data are only comparable from 1993 to 1996.

*** Excluding ICT Wholesaling industries.

Sources: Statistics Canada and Industry Canada.

All underlined figures are Industry Canada estimates.

See Sources and Technical Notes for more details.

ICT Sector Revenues: 1993 - 1998
(Manufacturing and Services)

<i>SIC or NAICS</i>	<i>Industry (\$'000)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% Change 1997-1998</i>	<i>% Change 1993-1998</i>	<i>CAGR 1993-1998</i>
3341	Record Player, Radio and Television Receiver Industry	668,585	821,370	811,951	592,800	205,442	<u>196,255</u>	<u>-4.5%</u>	<u>-70.6%</u>	<u>-21.7%</u>
3351	Telecommunication Equipment Industry	4,192,552	4,871,576	6,267,300	5,477,857	6,961,900	<u>7,993,628</u>	<u>14.8%</u>	<u>90.7%</u>	<u>13.8%</u>
3352	Electronic Parts and Components Industry	3,636,628	3,917,958	4,975,857	5,769,649	5,954,091	<u>6,926,442</u>	<u>16.3%</u>	<u>90.5%</u>	<u>13.8%</u>
3359	Other Communication and Electronic Equipment Industries	2,776,864	2,825,966	2,876,691	3,226,118	3,697,542	<u>3,848,151</u>	<u>4.1%</u>	<u>38.6%</u>	<u>6.7%</u>
3361	Electronic Computing and Peripheral Equipment Industry	3,316,961	5,645,716	7,626,920	6,176,308	5,285,527	<u>5,930,231</u>	<u>12.2%</u>	<u>78.8%</u>	<u>12.3%</u>
3368	Electronic & Other Office, Store & Business Machine Ind.	745,497	431,305	387,707	374,340	476,515	<u>491,218</u>	<u>3.1%</u>	<u>-34.1%</u>	<u>-8.0%</u>
3381	Communications and Energy Wire and Cable Industry	1,557,419	1,855,292	2,045,616	1,833,514	1,898,702	<u>1,933,738</u>	<u>1.8%</u>	<u>24.2%</u>	<u>4.4%</u>
3911	Indicating, Recording and Controlling Instruments Industry	1,313,436	1,405,389	1,505,970	1,624,227	1,596,812	<u>1,639,377</u>	<u>2.7%</u>	<u>24.8%</u>	<u>4.5%</u>
3912	Other Instruments and Related Products Industry	1,230,694	1,393,310	1,596,530	1,728,005	1,810,077	<u>1,959,823</u>	<u>8.3%</u>	<u>59.2%</u>	<u>9.8%</u>
	Total ICT Manufacturing	19,438,636	23,167,882	28,094,542	26,802,818	27,886,608	30,918,863	10.9%	59.1%	9.7%
4814	Cable Television	2,155,085	2,337,623	2,534,880	2,681,549	2,787,380	3,065,784	10.0%	42.3%	7.3%
482/483	Telecommunications Services*	17,084,000	18,163,000	20,110,000	22,509,000	22,835,900	28,493,936	..	..	..
772	Software and Computer Services**	8,081,500	9,895,700	10,916,000	11,829,000	12,737,000	<u>15,287,000</u>	<u>20.0%</u>	<u>89.2%</u>	<u>13.6%</u>
5743/44/91	ICT Wholesaling	21,986,920	24,732,055	27,325,475	32,638,864	35,419,680	<u>38,585,976</u>	<u>8.9%</u>	<u>75.5%</u>	<u>11.9%</u>
53242	Office Machinery & Equipment Rental & Leasing	..	..	..	..	..	..	..	..	..
	Total ICT Services***	49,307,505	55,128,378	60,886,355	69,658,413	73,779,960	85,432,696	15.8%	73.3%	11.6%
	Total ICT Sector***	68,746,141	78,296,260	88,980,897	96,461,231	101,666,568	116,351,559	14.4%	69.2%	11.1%

* Due to methodological changes in both 1997 and 1998, data are only comparable from 1993 to 1996.

** Survey methodology changed in 1997, data are not strictly comparable to data for previous years.

*** Due to methodological changes in Telecommunications Services and Software and Computer Services industries, data are only comparable from 1993 to 1996.

*** Due to methodological changes in Telecommunications Services industry, growth is slightly overstated.

Sources: Statistics Canada and Industry Canada.

All underlined figures are Industry Canada estimates.

See Sources and Technical Notes for more details.

ICT Sector Employment: 1993 - 1998
(Manufacturing and Services)

<i>SIC or NAICS</i>	<i>Industry</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% Change 1997-1998</i>	<i>% Change 1993-1998</i>	<i>CAGR 1993-1998</i>
3341	Record Player, Radio and Television Receiver Industry	1,433	1,516	1,173	864	895	769	-14.1%	-46.3%	-11.7%
3351	Telecommunication Equipment Industry	18,704	19,287	20,706	16,522	18,835	19,555	3.8%	4.5%	0.9%
3352	Electronic Parts and Components Industry	13,065	14,293	17,670	19,150	20,161	21,062	4.5%	61.2%	10.0%
3359	Other Communication and Electronic Equipment Industries	21,564	19,095	18,036	20,076	21,717	21,167	-2.5%	-1.8%	-0.4%
3361	Electronic Computing and Peripheral Equipment Industry	10,983	13,749	13,499	12,933	13,839	14,161	2.3%	28.9%	5.2%
3368	Electronic & Other Office, Store & Business Machine Ind.	4,444	2,103	2,198	2,356	2,788	2,743	-1.6%	-38.3%	-9.2%
3381	Communications and Energy Wire and Cable Industry	7,361	6,868	7,107	6,271	5,839	5,544	-5.1%	-24.7%	-5.5%
3911	Indicating, Recording and Controlling Instruments Industry	9,678	9,429	10,139	10,895	10,790	10,738	-0.5%	11.0%	2.1%
3912	Other Instruments and Related Products Industry	7,496	7,858	8,853	10,351	9,640	10,194	5.7%	36.0%	6.3%
	Total ICT Manufacturing	94,728	94,198	99,381	99,418	104,504	105,933	1.4%	11.8%	2.3%
4814	Cable Television	9,225	9,432	10,500	9,483	8,971	9,272	3.4%	0.5%	0.1%
482/483	Telecommunications Services	107,500	110,600	115,600	104,100	103,100	105,100	1.9%	-2.2%	-0.5%
772	Software and Computer Services*	96,610	103,895	117,919	132,244	162,219	189,583	16.9%	96.2%	14.4%
5743/44/91	ICT Wholesaling	80,846	83,974	90,057	96,810	99,234	102,130	2.9%	26.3%	4.8%
53242	Office Machinery & Equipment Rental & Leasing	..	..	..	..	..	..	..	..	..
	Total ICT Services*	294,181	307,901	334,076	342,637	373,524	406,085	8.7%	38.0%	6.7%
	Total ICT Sector*	388,909	402,099	433,457	442,055	478,028	512,018	7.1%	31.7%	5.7%
	TOTAL EMPLOYMENT in CANADA	13,014,700	13,291,700	13,505,500	13,676,200	13,940,600	14,326,400	2.8%	10.1%	1.9%
	ICT EMPLOYMENT as a % of CDN EMPLOYMENT	3.0%	3.0%	3.2%	3.2%	3.4%	3.6%			

* Including self-employed. Survey methodology changed in 1997, data are not strictly comparable to data for previous years.

Sources: Statistics Canada and Industry Canada.

All underlined figures are Industry Canada estimates.

See Sources and Technical Notes for more details.

Share

ICT Sector GDP at Factor Cost: 1993 - 1998 (in constant dollars of 1992)
(Manufacturing and Services)

<i>SIC or NAICS</i>	<i>Industry (\$'000)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% Change 1997-1998</i>	<i>% Change 1993-1998</i>	<i>CAGR 1993-1998</i>
3341	Record Player, Radio and Television Receiver Industry	87,000	116,000	92,000	60,000	48,000	41,000	-14.6%	-52.9%	-14.0%
3351	Telecommunication Equipment Industry	1,810,000	2,007,000	2,456,000	1,930,000	2,374,000	2,559,000	7.8%	41.4%	7.2%
3352	Electronic Parts and Components Industry	596,000	730,000	963,000	1,091,000	1,223,000	1,463,000	19.6%	145.5%	19.7%
3359	Other Communication and Electronic Equipment Industries	1,198,000	1,202,000	1,178,000	1,297,000	1,392,000	1,446,000	3.9%	20.7%	3.8%
336	Office, Store and Business Machines Ind. (Computer Eqpt)	806,000	1,046,000	1,393,000	1,213,000	1,356,000	1,759,000	29.7%	118.2%	16.9%
3381	Communications and Energy Wire and Cable Industry	453,000	488,000	470,000	485,000	517,000	625,000	20.9%	38.0%	6.6%
3911/12	Indicating, Recording, Controlling and Other Instruments...	1,154,000	1,192,000	1,251,000	1,265,000	1,311,000	1,329,000	1.4%	15.2%	2.9%
	Total ICT Manufacturing	6,104,000	6,781,000	7,803,000	7,341,000	8,221,000	9,222,000	12.2%	51.1%	8.6%
4814	Cable Television	1,085,000	1,084,000	1,013,000	1,019,000	1,028,000	1,113,000	8.3%	2.6%	0.5%
482/483	Telecommunications Services	12,453,000	12,945,000	13,391,000	13,781,000	14,513,000	15,684,000	8.1%	25.9%	4.7%
772	Software and Computer Services	4,651,000	5,569,000	6,546,000	7,033,000	8,165,000	9,584,000	17.4%	106.1%	15.6%
5743/44/91	ICT Wholesaling	..	..	..	..	..	..	..	..	..
53242	Office Machinery & Equipment Rental & Leasing	..	..	..	..	..	..	..	..	..
	Total ICT Services*	18,189,000	19,598,000	20,950,000	21,833,000	23,706,000	26,381,000	11.3%	45.0%	7.7%
	Total ICT Sector*	24,293,000	26,379,000	28,753,000	29,174,000	31,927,000	35,603,000	11.5%	46.6%	7.9%
	CANADIAN GDP	618,422,000	645,956,000	663,082,000	673,088,000	700,804,000	721,003,000	2.9%	16.6%	3.1%
	ICT GDP as a PERCENTAGE of CANADIAN GDP	3.9%	4.1%	4.3%	4.3%	4.6%	4.9%			

* Excluding ICT Wholesaling industries.

Source: Statistics Canada.

See Sources and Technical Notes for more details.

ICT Sector Intramural R&D Expenditures: 1993 - 1998
(Manufacturing and Services)

<i>SIC or NAICS</i>	<i>Industry (\$'000)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% Change 1997-1998</i>	<i>% Change 1993-1998</i>	<i>CAGR 1993-1998</i>
3341	Record Player, Radio and Television Receiver Industry	10,662	12,023	11,540	17,706	23,283	18,136	-22.1%	70.1%	11.2%
3351	Telecommunication Equipment Industry	906,052	1,112,155	1,380,560	1,517,137	1,745,935	2,078,054	19.0%	129.4%	18.1%
3352	Electronic Parts and Components Industry	48,542	57,726	67,616	83,514	84,599	96,951	14.6%	99.7%	14.8%
3359	Other Communication and Electronic Equipment Industries	421,977	458,260	351,402	315,977	342,641	353,949	3.3%	-16.1%	-3.5%
336	Office, Store and Business Machines Industries (Computer Equip)	309,209	331,304	338,265	329,932	357,644	349,896	-2.2%	13.2%	2.5%
3381	Communications and Energy Wire and Cable Industry	2,298	4,239	3,648	9,707	10,128	10,737	6.0%	367.2%	36.1%
3911	Indicating, Recording and Controlling Instruments Industry	26,580	33,697	39,992	46,576	33,352	35,307	5.9%	32.8%	5.8%
3912	Other Instruments and Related Products Industry	43,107	57,286	64,299	58,660	71,762	79,847	11.3%	85.2%	13.1%
	Total ICT Manufacturing	1,768,427	2,066,690	2,257,322	2,379,209	2,669,344	3,022,877	13.2%	70.9%	11.3%
4814/21/39	Cable Television and Telecommunications Services*	252,604	245,100	192,011	155,032	137,204	139,987	2.0%	-44.6%	-11.1%
772	Software and Computer Services	318,089	503,232	546,164	575,198	604,580	651,090	7.7%	104.7%	15.4%
5743/44/91	ICT Wholesaling	152,278	218,337	266,497	271,570	311,835	356,319	14.3%	134.0%	18.5%
53242	Office Machinery & Equipment Rental & Leasing	..	..	..	..	..	..	..	..	..
	Total ICT Services	722,971	966,669	1,004,672	1,001,800	1,053,619	1,147,396	8.9%	58.7%	9.7%
	Total ICT Sector	2,491,398	3,033,359	3,261,994	3,381,009	3,722,963	4,170,273	12.0%	67.4%	10.9%
	CANADIAN PRIVATE SECTOR R&D	6,432,000	7,424,000	8,059,000	8,087,000	8,519,000	9,123,000	7.1%	41.8%	7.2%
	ICT R&D as a % of CANADIAN PRIVATE SECTOR R&D	38.7%	40.9%	40.5%	41.8%	43.7%	45.7%			

* Cable Television and Telecommunications Services are combined to maintain confidentiality among respondents.

Source: Statistics Canada.

See Sources and Technical Notes for more details.

Total ICT Trade
Aggregate Statistics: 1993 - 1998

<i>ICT Manufacturing</i> (\$'000)	1993	1994	1995	1996	1997	1998	% change 1997-1998	% change 1993-1998	CAGR 1993-1998
Total Exports	12,790,559	16,481,436	20,105,085	21,272,640	23,400,187	25,058,097	7.1%	95.9%	14.4%
Imports	25,123,273	31,104,807	36,037,925	37,004,402	42,192,677	45,879,173	8.7%	82.6%	12.8%
Trade Balance	-12,332,714	-14,623,371	-15,932,840	-15,731,762	-18,792,490	-20,821,076	10.8%	68.8%	11.0%

<i>ICT Services</i> (\$'000)	1993	1994	1995	1996	1997	1998	% change 1997-1998	% change 1993-1998	CAGR 1993-1998
Exports (Receipts)	2,412,000	2,690,000	3,060,000	2,719,000	3,100,000	3,549,000	14.5%	47.1%	8.0%
Imports (Payments)	1,731,000	2,076,000	2,241,000	2,205,000	2,650,000	3,057,000	15.4%	76.6%	12.0%
Trade Balance	681,000	614,000	819,000	514,000	450,000	492,000	9.3%	-27.8%	-6.3%

<i>Total ICT</i> (\$'000)	1993	1994	1995	1996	1997	1998	% change 1997-1998	% change 1993-1998	CAGR 1993-1998
Total Exports	15,202,559	19,171,436	23,165,085	23,991,640	26,500,187	28,607,097	8.0%	88.2%	13.5%
Imports	26,854,273	33,180,807	38,278,925	39,209,402	44,842,677	48,936,173	9.1%	82.2%	12.8%
Trade Balance	-11,651,714	-14,009,371	-15,113,840	-15,217,762	-18,342,490	-20,329,076	10.8%	74.5%	11.8%

Source: Statistics Canada.

See Sources and Technical Notes for more details.

ICT Sector Total Exports: 1993 - 1998
(Manufacturing and Services)

<i>SIC</i>	<i>Industry (\$'000)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% Change 1997-1998</i>	<i>% Change 1993-1998</i>	<i>CAGR 1993-1998</i>
3341	Record Player, Radio and Television Receiver Industry	144,635	217,306	256,600	240,120	211,102	257,075	21.8%	77.7%	12.2%
3351	Telecommunication Equipment Industry	1,924,310	2,329,878	2,839,265	3,470,687	3,895,582	4,188,352	7.5%	117.7%	16.8%
3352	Electronic Parts and Components Industry	2,992,473	3,468,454	4,278,514	5,199,488	6,092,445	5,879,909	-3.5%	96.5%	14.5%
3359	Other Communication and Electronic Equipment Industries	974,174	1,473,751	1,649,224	1,958,218	2,445,220	3,108,444	27.1%	219.1%	26.1%
3361	Electronic Computing and Peripheral Equipment Industry	4,293,010	5,975,271	7,756,843	6,706,005	6,611,085	7,077,139	7.0%	64.9%	10.5%
3368	Electronic & Other Office, Store & Business Machine Industries	356,132	391,522	372,226	417,783	529,697	561,925	6.1%	57.8%	9.6%
3381	Communications and Energy Wire and Cable Industry	356,721	423,627	574,316	646,813	725,779	953,525	31.4%	167.3%	21.7%
3911	Indicating, Recording and Controlling Instruments Industry	833,335	1,175,752	1,213,702	1,261,628	1,299,900	1,251,131	-3.8%	50.1%	8.5%
3912	Other Instruments and Related Products Industry	915,770	1,025,875	1,164,395	1,371,897	1,589,378	1,780,597	12.0%	94.4%	14.2%
	Total ICT Manufacturing Exports	12,790,559	16,481,436	20,105,085	21,272,640	23,400,187	25,058,097	7.1%	95.9%	14.4%
	Total Canadian Merchandise Exports	182,324,000	218,687,000	254,569,000	275,819,000	298,071,000	318,384,000	6.8%	74.6%	11.8%
	Communications Services*	1,417,000	1,618,000	1,753,000	1,748,000	1,999,000	2,226,000	11.4%	57.1%	9.5%
	Computer Services	995,000	1,072,000	1,307,000	971,000	1,101,000	1,323,000	20.2%	33.0%	5.9%
	Total ICT Services Exports	2,412,000	2,690,000	3,060,000	2,719,000	3,100,000	3,549,000	14.5%	47.1%	8.0%
	Total Canadian Commercial Services Exports	13,113,000	15,492,000	16,805,000	19,357,000	21,936,000	25,039,000	14.1%	90.9%	13.8%
	Total ICT Sector Exports	15,202,559	19,171,436	23,165,085	23,991,640	26,500,187	28,607,097	8.0%	88.2%	13.5%
	TOTAL CANADIAN EXPORTS	195,437,000	234,179,000	271,374,000	295,176,000	320,007,000	343,423,000	7.3%	75.7%	11.9%
	ICT Mfg Exports as a % of Cdn Merchandise Exports	7.0%	7.5%	7.9%	7.7%	7.9%	7.9%			
	ICT Services Exports as a % of Cdn Comm. Services Exp.	18.4%	17.4%	18.2%	14.0%	14.1%	14.2%			
	ICT EXPORTS as a % of CANADIAN EXPORTS	7.8%	8.2%	8.5%	8.1%	8.3%	8.3%			

* Including Telecommunications Services and Postal Courier Services.

Source: Statistics Canada.

See Sources and Technical Notes for more details.

ICT Sector Imports: 1993 - 1998
(Manufacturing and Services)

<i>SIC</i>	<i>Industry (\$'000)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% Change 1997-1998</i>	<i>% Change 1993-1998</i>	<i>CAGR 1993-1998</i>
3341	Record Player, Radio and Television Receiver Industry	2,051,402	2,322,757	2,582,827	2,272,643	2,695,733	3,112,964	15.5%	51.7%	8.7%
3351	Telecommunication Equipment Industry	1,238,661	1,414,366	1,333,081	1,656,914	1,847,461	2,055,793	11.3%	66.0%	10.7%
3352	Electronic Parts and Components Industry	5,976,503	11,123,509	14,135,012	13,824,493	14,668,378	15,435,957	5.2%	158.3%	20.9%
3359	Other Communication and Electronic Equipment Industries	1,623,154	1,861,556	2,048,400	2,314,515	3,022,269	3,289,891	8.9%	102.7%	15.2%
3361	Electronic Computing and Peripheral Equipment Industry	7,839,755	6,705,253	7,747,837	8,496,989	9,998,789	10,560,764	5.6%	34.7%	6.1%
3368	Electronic & Other Office, Store & Business Machine Industries	1,105,514	1,153,878	1,214,668	1,250,154	1,396,829	1,587,148	13.6%	43.6%	7.5%
3381	Communications and Energy Wire and Cable Industry	469,035	630,751	500,975	606,572	733,877	899,931	22.6%	91.9%	13.9%
3911	Indicating, Recording and Controlling Instruments Industry	1,751,224	2,469,026	2,967,817	2,857,602	3,619,919	4,063,796	12.3%	132.1%	18.3%
3912	Other Instruments and Related Products Industry	3,068,025	3,423,711	3,507,308	3,724,520	4,209,422	4,872,929	15.8%	58.8%	9.7%
	Total ICT Manufacturing Imports	25,123,273	31,104,807	36,037,925	37,004,402	42,192,677	45,879,173	8.7%	82.6%	12.8%
	Total Canadian Merchandise Imports	169,953,000	202,736,000	225,553,000	232,566,000	272,924,000	298,382,000	9.3%	75.6%	11.9%
	Communications Services*	1,349,000	1,550,000	1,745,000	1,695,000	2,093,000	2,338,000	11.7%	73.3%	11.6%
	Computer Services	382,000	526,000	496,000	510,000	557,000	719,000	29.1%	88.2%	13.5%
	Total ICT Services Imports	1,731,000	2,076,000	2,241,000	2,205,000	2,650,000	3,057,000	15.4%	76.6%	12.0%
	Total Canadian Commercial Services Imports	16,859,000	19,602,000	20,260,000	22,381,000	24,792,000	27,466,000	10.8%	62.9%	10.3%
	Total ICT Sector Imports	26,854,273	33,180,807	38,278,925	39,209,402	44,842,677	48,936,173	9.1%	82.2%	12.8%
	TOTAL CANADIAN IMPORTS	186,812,000	222,338,000	245,813,000	254,947,000	297,716,000	325,848,000	9.4%	74.4%	11.8%
	ICT Mfg Imports as a % of Cdn Merchandise Imports	14.8%	15.3%	16.0%	15.9%	15.5%	15.4%			
	ICT Services Imports as a % of Cdn Comm. Services Imp.	10.3%	10.6%	11.1%	9.9%	10.7%	11.1%			
	ICT IMPORTS as a % of CANADIAN IMPORTS	14.4%	14.9%	15.6%	15.4%	15.1%	15.0%			

* Including Telecommunications Services and Postal Courier Services.

Source: Statistics Canada.

See Sources and Technical Notes for more details.

ICT Sector Trade Balance: 1993 - 1998
(Manufacturing and Services)

<i>SIC</i>	<i>Industry (\$'000)</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>% Change 1997-1998</i>	<i>% Change 1993-1998</i>	<i>CAGR 1993-1998</i>
3341	Record Player, Radio and Television Receiver Industry	-1,906,767	-2,105,451	-2,326,227	-2,032,523	-2,484,631	-2,855,889	-14.9%	-49.8%	-8.4%
3351	Telecommunication Equipment Industry	685,649	915,512	1,506,184	1,813,773	2,048,121	2,132,559	4.1%	211.0%	25.5%
3352	Electronic Parts and Components Industry	-2,984,030	-7,655,055	-9,856,498	-8,625,005	-8,575,933	-9,556,048	-11.4%	-220.2%	-26.2%
3359	Other Communication and Electronic Equipment Industries	-648,980	-387,805	-399,176	-356,297	-577,049	-181,447	68.6%	72.0%	22.5%
3361	Electronic Computing and Peripheral Equipment Industry	-3,546,745	-729,982	9,006	-1,790,984	-3,387,704	-3,483,625	-2.8%	1.8%	0.4%
3368	Electronic & Other Office, Store & Business Machine Industries	-749,382	-762,356	-842,442	-832,371	-867,132	-1,025,223	-18.2%	-36.8%	-6.5%
3381	Communications and Energy Wire and Cable Industry	-112,314	-207,124	73,341	40,241	-8,098	53,594	--	--	--
3911	Indicating, Recording and Controlling Instruments Industry	-917,889	-1,293,274	-1,754,115	-1,595,974	-2,320,019	-2,812,665	-21.2%	-206.4%	-25.1%
3912	Other Instruments and Related Products Industry	-2,152,255	-2,397,836	-2,342,913	-2,352,623	-2,620,044	-3,092,332	-18.0%	-43.7%	-7.5%
	Total ICT Manufacturing Trade Balance	-12,332,714	-14,623,371	-15,932,840	-15,731,762	-18,792,490	-20,821,076	-10.8%	-68.8%	-11.0%
	Total Canadian Merchandise Trade Balance	12,371,000	15,951,000	29,016,000	43,253,000	25,147,000	20,002,000	-20.5%	61.7%	10.1%
	Communications Services*	68,000	68,000	8,000	53,000	-94,000	-112,000	-19.1%	--	--
	Computer Services	613,000	546,000	811,000	461,000	544,000	604,000	11.0%	-1.5%	-0.3%
	Total ICT Services Trade Balance	681,000	614,000	819,000	514,000	450,000	492,000	9.3%	-27.8%	-6.3%
	Total Canadian Commercial Services Trade Balance	-3,746,000	-4,110,000	-3,455,000	-3,024,000	-2,856,000	-2,427,000	15.0%	35.2%	8.3%
	Total ICT Sector	-11,651,714	-14,009,371	-15,113,840	-15,217,762	-18,342,490	-20,329,076	-10.8%	-74.5%	-11.8%
	TOTAL CANADIAN TRADE BALANCE	8,625,000	11,841,000	25,561,000	40,229,000	22,291,000	17,575,000	-21.2%	103.8%	15.3%

* Including Telecommunications Services and Postal Courier Services.

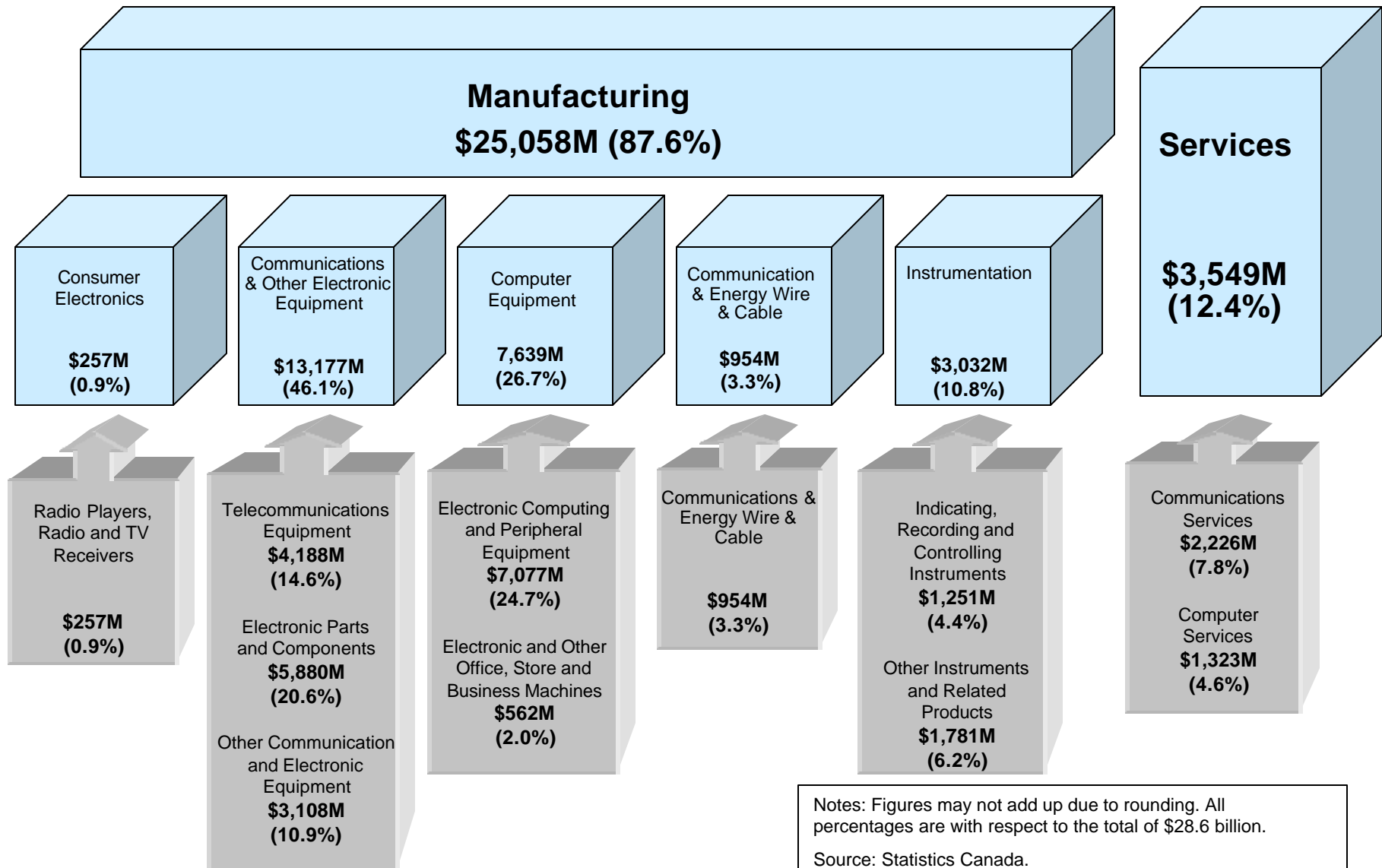
Source: Statistics Canada.

See Sources and Technical Notes for more details.

Section 5
ICT Trade: 1998

Information and Communications Technologies

Figure 10 - 1998 Total Exports: \$28.6 billion

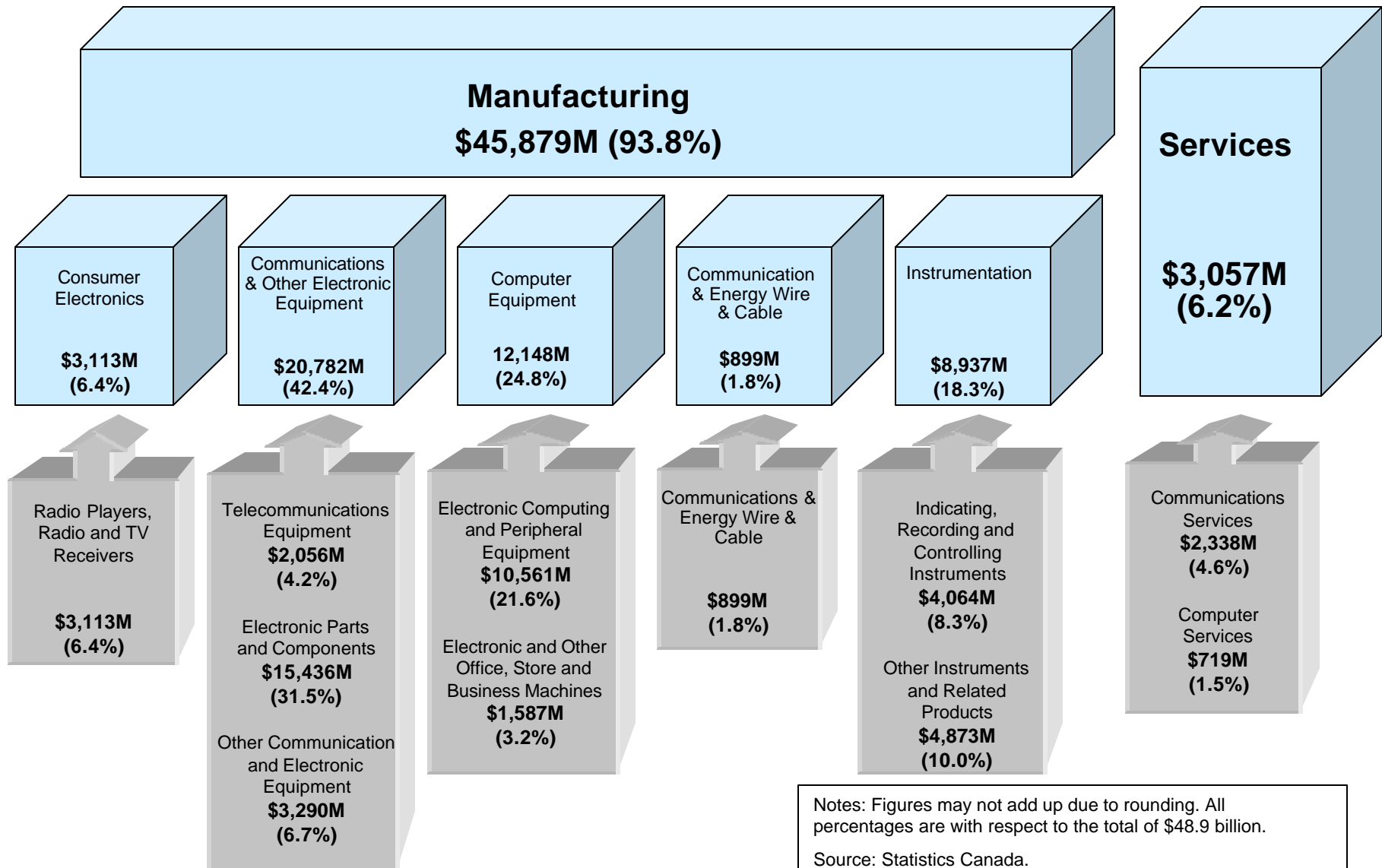


Notes: Figures may not add up due to rounding. All percentages are with respect to the total of \$28.6 billion.

Source: Statistics Canada.
See Sources and Technical Notes for more details.

Information and Communications Technologies

Figure 11 - 1998 Imports: \$48.9 billion

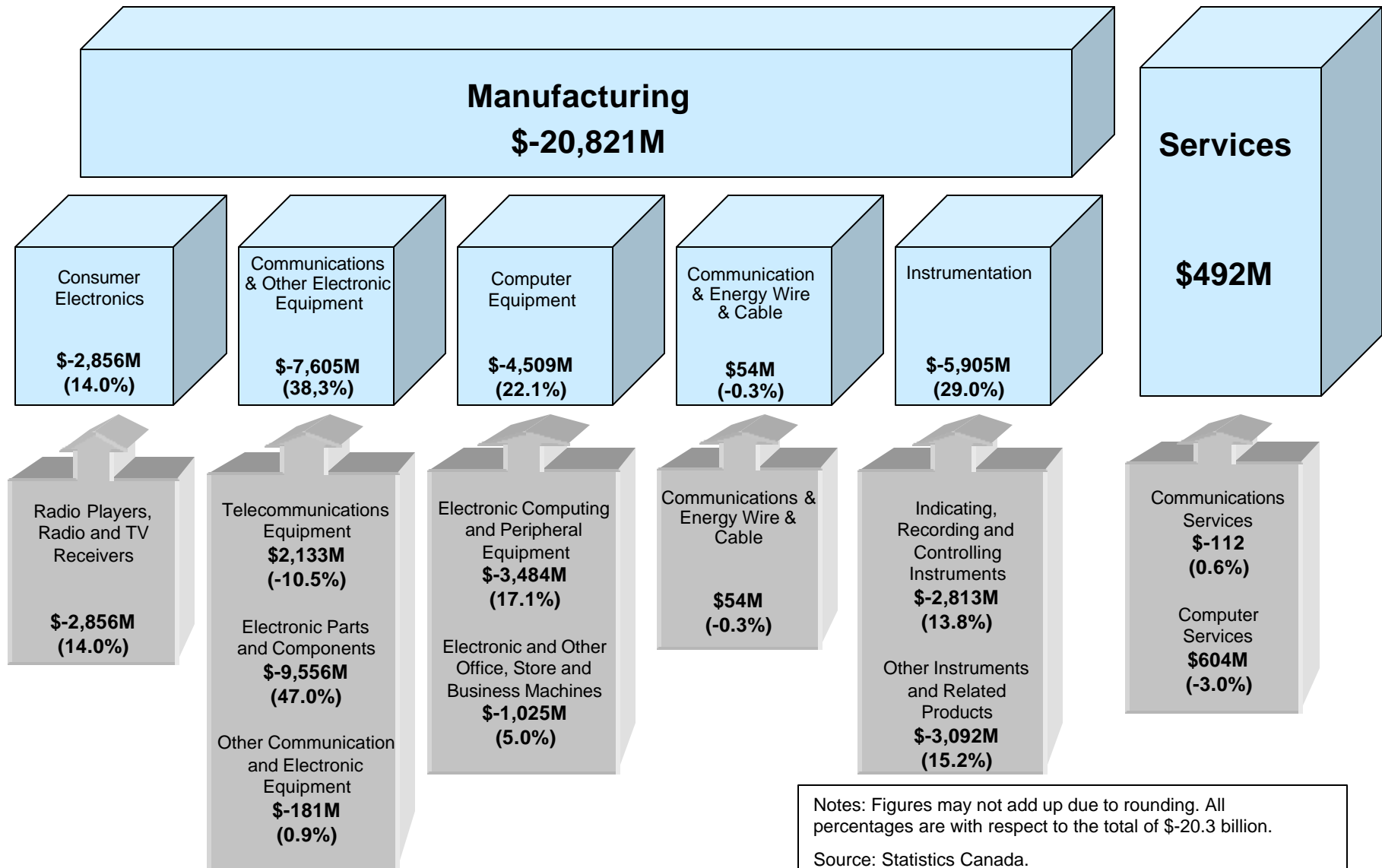


Notes: Figures may not add up due to rounding. All percentages are with respect to the total of \$48.9 billion.

Source: Statistics Canada.
See Sources and Technical Notes for more details.

Information and Communications Technologies

Figure 12 - 1998 Trade Balance: \$20.3 billion deficit



Notes: Figures may not add up due to rounding. All percentages are with respect to the total of \$-20.3 billion.

Source: Statistics Canada.
See Sources and Technical Notes for more details.

Statistical Appendices

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Financial and Statistical Definitions

Financial and Statistical Definitions

Readers are advised to consult with Statistics Canada on specific methodologies and definitions used throughout this publication, the relevant Statistics Canada documents contain such information.

General Definitions

Employment: Production employment plus administrative and executive employment. Does include self employed for the software and computer services industry.

Revenues: For manufacturing industries, this includes both manufacturing shipments and non-manufacturing shipments. For services industries, operating revenues are reported.

GDP: is a measure of an industry's value-added to the economy. GDP at factor cost is essentially total sales by the industry (gross output) less inputs of goods and services provided by sources other than the industry itself.

Intramural R&D Expenditures: Expenditures for R&D work performed by the reporting company, including work financed by others.

Trade Data Definitions

There is a fundamental difference between trade and production data. Production data also captures secondary production which occurs at the establishment level and differs from the principal activity to which they are classified. Trade data, on the other hand, classifies products as they cross the border regardless of the principal activity of the producing establishment. This data is captured as a commodity rather than as an industry good. In an effort to quantify industry trade, Statistics Canada associates the exported commodity code with an industry code. A simple example would be the case of an exported automobile engine which would be attributed to the Canadian Motor Vehicle Engine and Engine Parts Industry even though it may have been produced by a plant classified to the Motor Vehicle Industry. The same concepts also apply to service data.

Readers should note that this is a crude estimation of industry trade and is susceptible to errors. However, in the absence of a better measurement method, this type of estimation is one of few means available to estimate industrial trade.

Imports: All goods which have crossed Canada's territorial boundary, whether for immediate consumption in Canada or stored in bonded customs warehouses.

Total Exports: Total exports include both domestic exports and re-exports. DOMESTIC exports include goods grown, extracted or manufactured in Canada, including goods of foreign origin which have been materially transformed in Canada. RE-EXPORTS are exports of foreign goods which have not been materially transformed in Canada, including foreign goods withdrawn for export from bonded customs warehouses.

Payments: Total payments of companies located in Canada for services bought from abroad.

Receipts: Total receipts of companies located in Canada for services sold to clients located abroad.

Note: Payments and receipts refer to cross-border services. Where a subsidiary of a Canadian company located abroad either sells or buys a service in its local market, or trades a service with a third country, the transactions are outside the scope of the cross-border figures reported in this document. Such transactions abroad are between foreign resident parties, and are not covered by the Balance of payments data which deal only with transactions between Canadian residents and non-residents. Also, the domestic sales and purchases by Canadian subsidiaries of foreign companies with residents here in Canada are excluded from cross-border measures of trade, being resident-to-resident transactions.

Sources and Technical Notes

Sources

EMPLOYMENT

Manufacturing

Annual Survey of Manufactures (Cat. no. 31-203), Manufacturing, Construction and Energy Division, Statistics Canada.

Cable Television

Annual Return Cable Television (Cat. no. 56-205), Science and Technology Redesign Project, Statistics Canada.

Telecommunications Services

Survey of Employment, Payrolls and Hours (Cat. no. 72-002), Labour Division, Statistics Canada.

Software and Computer Services

Employees: Annual Survey of Computer Services, Services Division, Statistics Canada.

Self-employed: Labour Force Survey (Cat. no. 71-001), Household Surveys Division, Statistics Canada.

FINANCIAL DATA

Manufacturing

Annual Survey of Manufactures (Cat. no. 31-203), Manufacturing, Construction and Energy Division, Statistics Canada.

Cable Television

Annual Return Cable Television (Cat. no. 56-205), Science and Technology Redesign Project, Statistics Canada.

Telecommunications Services

For 1990 to 1996: Financial and Taxation Statistics for Enterprises (Cat. no. 61-219), Industrial Organization and Finance Division, Statistics Canada.

For 1997 and 1998: Annual Survey of Telecommunications Services Providers (Cat. no. 56-001), Science, Innovation and Electronic Information Division, Telecommunications Section, Statistics Canada.

Wholesaling

Annual Wholesale and Retail Trade Survey (Cat. no. 63-236), Distributive Trade Division, Statistics Canada.

Software and Computer Services

Annual Survey of Computer Services (Cat. no. 63-222), Services Division, Statistics Canada.

Sources

Office Machinery and Equipment Rental and Leasing

Survey of Business Services, Service Industries Division, Statistics Canada.

GROSS DOMESTIC PRODUCT (GDP)

Gross Domestic Product by Industry (Cat. no. 15-001), Industry Measures and Analysis Division, Statistics Canada.

INTRAMURAL RESEARCH AND DEVELOPMENT (R&D) EXPENDITURES

Special tabulations for Industry Canada; Science and Technology Redesign Project, Statistics Canada.

For Canadian total private sector R&D, 1997 Research and Development in Canadian Industry Survey (Cat. no. 88-001).

TRADE

ICT Manufacturing

Trade Data Online, International Trade Division, Statistics Canada.

ICT Services

Canada's International Transactions in Services (Cat. no. 67-203), Balance of Payments Division, Statistics Canada.

Technical Notes

EMPLOYMENT

Manufacturing

All 1998 figures come from the Canadian Industry Statistics information product and were estimated by Industry Canada.

Wholesaling

All wholesaling figures are Industry Canada estimates based on the Survey of Employment, Payrolls and Hours (SEPH). SEPH data are only available at the 3 digit SIC-E level of disaggregation. To estimate 4 digit employment values, Industry Canada uses 4 digit employee earnings and benefits figures from the Annual Wholesale and Retail Trade Survey to obtain a measure of the relative size (ratio) of each 4 digit component and applies these ratios to 3 digit employment figures from SEPH. In estimating 1998 employment figures, 1997 employee earnings and benefits ratios were used, since 1998 data from the Annual Wholesale and Retail Trade Survey were not available.

Software and Computer Services

As of 1997, data are collected and reported by Statistics Canada based on the new North American Industrial Classification System (NAICS). It is important to note that the concordance between the Standard Industry Classification (SIC) and NAICS is not perfect. Firms that were covered by SIC 772 (Software and Computer Services industry) are now part of seven NAICS industries, namely: Database and Directory Publishers (51114), Software Publishers (51121), On-Line Information Services (514191), Data Processing Services (51421), Office Machinery and Equipment Rental and Leasing (53242), Computer Systems Design and Related Services (54151), and Electronic and Precision Equipment Repair and Maintenance (81121). At the same time, not all the firms classified in these NAICS industries were previously classified in SIC 772 (Software and Computer Services).

The number of employees reported by Industry Canada in this publication for Software and Computer Services (SIC 772) for 1997 and 1998 is the sum of the number of employees in the following NAICS industries: Software Publishers (51121), On-Line Information Services (514191), Data Processing Services (51421), and Computer Systems Design and Related Services (54151). Although the vast majority of the firms that were classified in SIC 772 are now classified in these four NAICS industries, the number of employees for 1997 and 1998 is not strictly comparable to data for previous years.

Also, for 1998, the number of employees has been estimated by Industry Canada based on employment data from the Survey of Employment, Payrolls and Hours (Cat. no. 72-002), Labour Division, Statistics Canada.

Technical Notes

EMPLOYMENT (cont'd)

IMPORTANT NOTE

Different statistical methodologies were used in the collection of the employment data for the ICT services and manufacturing industries. The Labour Force Survey, the Survey of Employment, Payrolls and Hours, and the Annual Survey of Manufactures all use different statistical methodologies for providing data and were not intended to be aggregated. Industry Canada, however, feels that the aggregation of these survey results, despite their differences, does provide some insight into the performance of the Canadian ICT sector.

FINANCIAL DATA

Manufacturing

All 1998 figures come from the Canadian Industry Statistics information product and were estimated by Industry Canada.

Wholesaling

1998 operating revenues for Computers, Packaged Software and Other Electronic Machinery (SIC 5743 & 5744) was estimated based on 12 months of monthly data from the Monthly Wholesale Trade Survey (Cat. no. 31-001), Statistics Canada. 1998 operating revenues for Office and Store Machinery, Equipment and Supplies (SIC 5791) was estimated using a linear regression with employment as explanatory variable.

Software and Computer Services

As of 1997, data are collected and reported by Statistics Canada based on the new North American Industrial Classification System (NAICS). It is important to note that the concordance between the Standard Industry Classification (SIC) and NAICS is not perfect. Companies that were covered by SIC 772 (software and computer services industry) are now part of seven NAICS industries, namely: Database and Directory Publishers (51114), Software Publishers (51121), On-Line Information Services (514191), Data Processing Services (51421), Office Machinery and Equipment Rental and Leasing (53242), Computer Systems Design and Related Services (54151), and Electronic and Precision Equipment Repair and Maintenance (81121). At the same time, not all the firms classified in these NAICS industries were previously classified in SIC 772 (Software and Computer Services).

Financial data reported by Industry Canada in this publication for Software and Computer Services (SIC 772) for 1997 and 1998 is the sum of the following NAICS industries: Software Publishers (51121), On-Line Information Services (514191), Data Processing Services (51421), and Computer Systems Design

Technical Notes

and Related Services (54151). Although the vast majority of the firms that were classified in SIC 772 are now classified in these four NAICS industries, the financial data for 1997 and 1998 is not strictly comparable to data for previous years.

Also, 1998 revenue was estimated by Industry Canada using an adjusted indicator of the GDP for SIC 772 as explanatory variable.

Telecommunications Services

The data for 1997 and 1998 are not strictly comparable to the data for previous years due to methodological differences. Figures for the 1993 to 1996 period are derived from a sample of financial and taxation data submitted by corporations under the Canadian Income Tax Act. The reporting unit is the corporation and the tabulation unit is the enterprise (a family of corporation(s) under common ownership for which a set of consolidated statements is produced on an annual basis). Figures for 1997 and 1998 are derived from an Annual Census of business units classified in the telecommunication industry and the target unit is the establishment. The definition of accounting variables may also vary. Another methodological change occurred in 1998 with regards to the intra industry transactions (IIT). In 1998, operating revenues and expenditures were calculated on gross value of IIT, while net value was used for previous years.

INTRAMURAL RESEARCH AND DEVELOPMENT (R&D)

R&D figures for the telecommunications services and cable industries have been combined to maintain confidentiality among respondents.

It should also be noted that the reporting unit is generally the company or enterprise. This unit is used because a firm, which may have several establishments or even subsidiaries, will often have a centralized research unit. In the case of a company with decentralized research units, the report unit may be the division, if the accounting system enables divisions to supply the required data. This procedure creates a problem when classifying data by industry. A company can only be assigned to one industry although that company may have establishments in several industries. The assignment is based on the activity from which the firm derived the greatest portion of its income.

INTERNATIONAL TRADE IN ICT SERVICES

There have been significant revisions to the trade in services data as presented in last year's version of this publication (The Information and Communication Technologies Statistical Review: 1990-1997). For further details, please refer to the publication "Canada's International Transactions in Services" (Cat. no. 67-203), Statistics Canada.

GENERAL

All underlined figures in this publication are Industry Canada estimates based on Statistics Canada data.