



EMPLOYMENT LINKAGES AND STRUCTURAL CHANGES IN SINGAPORE¹

ABSTRACT

This paper studies the employment linkages in the Singapore economy using the input-output framework for 18 industrial sectors at 2-digit industrial classification. Using the 1995 and 2000 input-output tables, this paper generates a detailed breakdown of how a change in final demand in an industry creates employment within that industry as well as in other industries. The findings have allowed for an explicit analysis of employment linkages and structural changes in employment creation over time that occur within and between different sectors and industries. The results of the paper indicate the presence of strong employment linkages between different sectors of the economy, especially from the manufacturing to services sectors, but less so in the reverse direction. Such intermediate demand for services by the manufacturing industries would be a key driver towards increasing employment linkages and job creation in the services sector.

INTRODUCTION

As the Singapore economy evolves towards higher value-added activities, employment creation has shifted from the manufacturing to the services sector. Given that both these sectors form the “twin engines” of growth for the Singapore economy, it is crucial to examine the employment linkages between the two sectors.

Existing literatures showed that there is an increasing role of services for intermediate uses within developed economies (Greenhalgh and Gregory, 2001; Guerrier and Maliciani, 2005; Franke and Kalmbach, 2005). The results suggest that there is a rising demand for intermediate services for production of further services as well strong inter-industry linkages between the various sectors in an economy.

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This paper studies the employment linkages between the manufacturing and services sectors in the Singapore economy using the input-output framework. The input-output framework describes the interrelationship between producers and consumers and the interdependence among the different industries. Using the input-output tables, this paper generates a detailed breakdown of how a change in final demand in an industry creates employment within that industry as well as in other industries. The results obtained will allow for an explicit analysis of employment linkages and structural changes in employment creation over time that occur within and between different sectors and industries.

In brief, the framework calculates employment multipliers² for 18 industrial sectors at 2-digit industrial classification using the 1995 and 2000 IO Tables. A full explanation of the data sources and methodology together with description of the industrial sectors are given in [Appendix 1, 2 and 3](#) respectively.

The results of the paper indicate the presence of strong employment linkages between different sectors of the economy, especially from the manufacturing to services sectors, but less so in the reverse direction. Such intermediate demand for services by the manufacturing industries would be a key driver towards increasing employment linkages and job creation in the services sector.

EMPLOYMENT LINKAGES

Based on the computed employment multipliers for 1995, 2000 and 2004³ given in [Appendix 4, Exhibits 5, 6 and 7](#) respectively, the following results on the breakdown of the jobs created arising from a S\$1 billion increase in final demand of each industrial sector's goods or services were obtained:

- (a) The share of jobs created outside the same industry from an increase in final demand of that industry is shown to be higher for industries in the manufacturing and services sectors as compared to the construction and others sector⁴ in 1995, 2000 and 2004. The employment spill-over effects from these manufacturing and services industries into other industries are significant. For example, 31 per cent of the jobs created from a \$1 billion increase in final demand in the electronics industry are intra-industry (within the same industry), while 69 per cent are inter-industry (spill-over to other industries) in 2004 ([Exhibit 1](#)).

² Employment multipliers are calculated based on the closed model and it includes both the Leontief multiplier and Keynesian multiplier effects (direct, indirect and induced effects). Hence, the multipliers from the closed model will be larger than the open model (the open model includes only the Leontief multiplier effects). In the model, consumption of the household sector in final demand is treated as an endogenous variable, as a function of wage income since personal disposable income data is not available in Singapore.

³ The 2004 employment multipliers are simulated based on the assumptions stated in [Appendix 1](#).

⁴ Others sector comprises agriculture, mining and quarrying, utilities, domestic work and owner-occupied dwellings.

PERCENTAGE OF INTER AND INTRA-INDUSTRY JOBS CREATED IN SELECTED INDUSTRIES IN SINGAPORE, 2004

[Exhibit 1]

Increase in Final Demand in	Intra-Industry Jobs Created (%)	Inter-Industry Jobs Created (%)
Electronics	31.3	68.7
Finance	36.6	63.4
Construction	60.6	39.4
Others	64.7	35.4

See details in [Exhibit 8 at Appendix 4](#).

- (b) The employment spill-over effects from individual manufacturing industries to the services sector as a whole is stronger than from individual services industries to the manufacturing sector as a whole. Generally, the employment spill-over from the manufacturing sector to the services sector is greater than that vice versa ([Exhibit 2](#)).

The employment spill-over from the manufacturing sector to the services sector is greater than that vice versa.

ABSOLUTE NUMBER OF JOBS CREATED WITHIN AND BETWEEN SECTORS IN SINGAPORE, 2004

[Exhibit 2]

Increase of S\$1 Billion in Final Demand in	Total Number Jobs of Created in Manufacturing Sector	Total Number of Jobs Created in Services Sector	Total
Manufacturing	67,390	39,156	106,546
Services	4,163	62,122	66,285
Total	71,553	101,278	172,831

See details in [Exhibit 7 at Appendix 4](#).

- (c) There are also a higher number of jobs created by the services industries as a result of spill-over from other services industries, compared to the spill-over effect between industries within the manufacturing sector. In other words, the employment linkages between industries within the services sector are stronger than that between industries within the manufacturing sector ([Exhibit 3](#)).

PERCENTAGE OF OWN, MANUFACTURING AND SERVICES JOBS CREATED IN 2004 FOR SELECTED INDUSTRIES IN SINGAPORE

[Exhibit 3]

Increase in Final Demand in	Share of Total Jobs (%) Created in 2004 in		
	Intra-Industry	Inter-Industry	
	Own Industry	Manufacturing Sector	Services Sector
Petrochem	23.5	11.0	51.8
Electric	32.1	10.1	47.6
Electronic	31.3	8.9	50.2
Commerce	44.5	5.1	43.2
Comms	40.6	9.3	42.3
Finance	36.6	4.2	50.5

See details in [Exhibit 8 at Appendix 4](#).

- (d) The petrochemical, electrical products and electronic products industries have high employment spill-over effects, in particular to the services sector. This suggests that as these industries move up the value chain, there is a growing demand for efficient intermediate service inputs into their production structure. The growth of these industries will thus be vital to the employment growth of the services sector ([Exhibit 3](#)).
- (e) Among the services industries, the commerce industry benefited the most, with the highest number of jobs created as a result of a \$1 billion increase in final demand in all the manufacturing industries. ([Exhibits 5, 6 and 7 in Appendix 4](#).) This suggests that the employment linkages between the manufacturing sector and the commerce industry is the strongest compared to other services industries. This could be due to increasing use of marketing, wholesale and retail services by the manufacturing sector.

STRUCTURAL CHANGES IN EMPLOYMENT CREATION: INDUSTRY ANALYSIS

Since the Asian crisis, the manufacturing and services industries in Singapore have undergone major structural changes in employment creation. This can be identified in the change in percentage share of jobs created between 1995 and 2000 compared to that between 2000 and 2004.

- (f) Between 1995 and 2000, there was a decrease in the share of jobs created within the same industry for most of the manufacturing and services industries (Exhibit 4). This shows that an increase in final demand in an industry generated higher spill-over effects through employment creation in other industries in 2000 than in 1995. This trend is particularly strong in petrochemical, electronic products and communications industries. This could have been due to increasing global competition and the hollowing-out of lower value-added industries as well as increased production fragmentation leading to greater use of service links.

CHANGE IN PERCENTAGE SHARE OF TOTAL JOB CREATED IN SINGAPORE FOR SELECTED INDUSTRIES BETWEEN 1995 AND 2000 AND BETWEEN 2000 AND 2004

[Exhibit 4]

Increase in Final Demand in	Column (4) Change in Share of Total Jobs Created in (Between 1995 & 2000)			Column (5) Change in Share of Total Jobs Created in (Between 2000 & 2004)		
	Own Industry	Manufacturing Sector	Services Sector	Own Industry	Manufacturing Sector	Services Sector
Petrochem	-16.7	2.7	11.3	1.4	-0.4	-0.3
Electronic	-18.1	2.2	13.5	-4.3	-0.3	4.2
Medical	-12.4	1.6	9.07	0.0	-0.4	0.6
Commerce	-9.5	0.9	7.6	-0.7	-0.1	1.0
Comms	-10.3	1.8	7.3	-0.9	0.9	0.3

See details in Exhibit 8 at Appendix 4.

- (g) Between 2000 and 2004, the change in the share of jobs created in the same industry continued on a decreasing trend for most of the manufacturing industries. However, only two of the five services industries examined in this paper experience a similar change, (Exhibit 8 in Appendix 4). This implies that over time, there is increasing spill-over effects in general for the manufacturing industries through creation of more jobs in the services industries.
- (h) In general, the results from the post Asian crisis period of 2000 – 2004 suggest that the inter- and intra-industry change in the share of total jobs created was much lower for most of the manufacturing and services industries than that observed for the period 1995 – 2000. The effects of the restructuring process on employment seem to be levelling off to a steady state equilibrium. We could observe this trend in the petrochemical, medical and financial industries as the economy transits to higher value-added activities to sustain the GDP growth (Exhibit 4).

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POLICY IMPLICATIONS AND CONCLUSION

In summary, our findings reveal the presence of strong employment linkages between different sectors of the economy, especially from the manufacturing to services sectors, but less so in the reverse direction. Such intermediate demand for services by the manufacturing industries would be a key driver towards increasing employment linkages and job creation in the services sector.

On the whole, though new jobs will still be created in the manufacturing sector, the service sector will continue to contribute a larger share of all jobs created. Based on our findings, a rise in services employment can be seen with an associated parallel shift towards service (non-production) activities within the manufacturing labour force itself. Given the potential healthy employment growth in the services sector in the future, it is likely that increased linkages between the manufacturing and services sectors will be a key thrust of employment growth for the latter.

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SOURCES OF DATA

Input-Output tables for 1995 and 2000 from MTI were used to compute the total output multipliers.

Employment data based on administrative records from MRSD Data Warehouse was used in conjunction with the total output multipliers to obtain the total employment multipliers.

For the employment multipliers for 2004, where the input-output tables are unavailable from MTI, it is first assumed that the economic structure of 2004 stays the same as in 2000 so that the output multipliers for 2000 are equivalent to that of 2004, *ceteris paribus*. With the use of the GDP figures from the Singapore Yearbook of Statistics 2005 for the entire economy, we obtain the final demand figures for the entire economy and proportionally break it down into 18 industries for the analysis.

FRAMEWORK

APPENDIX 2

NOTATION

The following notations will be adopted in explaining the methodology used to construct the closed model employment multipliers:

- X_i : total sales (or output) of sector i
 X_j : total purchases (or inputs) of sector j ($X_i = X_j$ for $i = j$)
 X_{ij} : sales of intermediate goods by sector i to sector j
 C_i : personal consumption expenditure of goods and services produced by sector i
 F_i : value of output sold by sector i for final demand excluding personal consumption expenditure
 W_j : remuneration paid out by sector j
 a_{ij} : amount of input from sector i required by sector j in order to produce a dollar of output, where $a_{ij} = X_{ij}/X_j$

METHODOLOGY

We make use of the input-output approach as found in Toh and Low (1994) and Department of Statistics, Singapore (1997) to compute the Leontief-Keynes output multipliers and the subsequent employment multipliers.

For illustration purposes, we consider an economy with 3 sectors together with personal consumption. From the above notation, we can denote the system of equations linking total output with intermediate and final demand as follows:

$$\begin{aligned}
 X_1 &= X_{11} + X_{12} + X_{13} + C_1 + F_1 \\
 X_2 &= X_{21} + X_{22} + X_{23} + C_2 + F_2 \\
 X_3 &= X_{31} + X_{32} + X_{33} + C_3 + F_3 \\
 W &= W_1 + W_2 + W_3
 \end{aligned}$$

The above equations can be rewritten as the following (note that $X_{ij} = a_{ij}X_j$):

$$\begin{aligned}
 X_1 &= a_{11}X_1 + a_{12}X_2 + a_{13}X_3 + a_{14}W + F_1 \\
 X_2 &= a_{21}X_1 + a_{22}X_2 + a_{23}X_3 + a_{24}W + F_2 \\
 X_3 &= a_{31}X_1 + a_{32}X_2 + a_{33}X_3 + a_{34}W + F_3 \\
 W &= a_{41}X_1 + a_{42}X_2 + a_{43}X_3
 \end{aligned}$$

Expressing this in matrix form, we have:

$$X = AX + F$$

where:

$$X = \begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ W \end{bmatrix}, A = \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \\ a_{41} & a_{42} & a_{43} & 0 \end{bmatrix}, F = \begin{bmatrix} F_1 \\ F_2 \\ F_3 \\ 0 \end{bmatrix}$$

$$X - AX = F$$

$$X(I - A) = F$$

$$X = (I - A)^{-1}F$$

where I denotes the 4x4 identity matrix. The matrix $(I - A)^{-1}$ is known as the Leontief output multiplier matrix, where each entry in the matrix indicates the total output generated arising from per S\$1m of final demand from sector i .

To obtain the corresponding employment multipliers, we first obtain the employment to total output ratio for each sector i by dividing the employment figure for sector i by the corresponding total output figure. Denote this ratio as e_i . Multiplying every entry in the $(I - A)^{-1}$ matrix by e_i will yield the corresponding employment multiplier.

INDUSTRY CLASSIFICATIONS

APPENDIX 3

18 distinct industrial sectors were considered in the analysis (11 Manufacturing, 5 Services, Construction and Others). The abbreviations apply for tables found in [Appendix 4](#).

	Description
Food	Food, Beverage and Tobacco
Textiles	Textile and Wearing Apparel
Paper	Paper Products and Printing
Petrochem	Petroleum, Chemical, Rubber and Plastics
Fab Metal	Fabricated Metal Products
Mach	Machinery and Equipment
Electric	Electrical Products
Electronic	Electronic Products
Medical	Medical and Precision Instruments
Trans	Transport Equipment
Other Mfg	Other Manufacturing
Commerce	Wholesale & Retail Trade and Hotels & Restaurants
Comms	Transport, Storage and Communications
Finance	Financial Intermediation
RE & Biz	Real Estate and Business Services
CSPS	Community, Social and Personal Services
Construct	Construction
Others	Agriculture, Mining & Quarrying, Utilities, Domestic Workers, Owner-Occupied Dwellings

TABLES BASED ON THE 18-INDUSTRIAL SECTOR ANALYSIS

APPENDIX 4

EMPLOYMENT GENERATED FOR \$1 BILLION INCREASE IN FINAL DEMAND* — 1995

[Exhibit 5]

S\$1 Billion Increase in Final Demand in (Sector)	Increases Overall Employment in (Sector) by																		
	Food	Textiles	Paper	Petrochem	Fab Metal	Mach	Electrical	Electronic	Medical	Trans	Other Mfg	Commerce	Comms	Finance	RE & Biz	CSPS	Construct	Others	TOTAL
Food	4,881.9	31.8	232.2	36.0	185.4	28.2	7.1	14.5	2.1	38.0	139.4	1901.7	401.2	132.7	539.7	538.5	67.1	663.3	9,840.3
Textiles	73.6	15,802	122.5	27.9	26.5	16.9	7.1	14.2	1.4	38.0	44.1	1,685.7	436.9	165.1	480.8	597.4	71.1	722.1	20,333.3
Paper	55.1	40.6	7,543.3	38.4	25.4	20.8	9.4	15.3	2.0	40.1	43.1	1,689.6	442.3	145.7	548.3	636.8	76.7	722.6	12,095.3
Petrochem	20.6	14.4	52.9	1,443.7	42.8	11.5	3.9	6.1	0.7	17.7	31.8	660.6	187.5	74.8	255.1	242.4	36.0	375.5	3,478.0
Fab Metal	49.6	33.4	109.3	29.4	4,239.5	65.0	19.7	47.5	7.9	51.6	238.3	1,567.5	417.5	134.3	514.6	592.2	76.6	694.2	8,887.9
Mach	54.7	44.9	115.2	29.2	122.6	7,904.1	16.8	20.6	7.7	63.7	151.3	1,675.3	485.9	157.6	601.9	658.0	79.8	732.5	12,921.6
Electrical	41.6	28.5	142.5	32.3	145.4	52.9	4,108.7	55.3	5.7	37.7	57.5	1,380.8	360.9	121.8	422.9	485.4	59.7	582.6	8,122.2
Electronic	18.4	22.5	58.3	18.9	33.2	10.2	18.5	2,244.3	1.5	15.1	34.4	641.4	165.0	77.5	212.8	228.3	25.8	249.2	4,075.2
Medical	45.7	29.3	112.5	38.9	87.7	24.1	9.7	29.3	6,904.8	34.6	117.4	1,453.1	393.5	146.2	411.3	516.1	61.9	625.4	11,041.6
Trans	64.6	54.4	117.9	32.4	127.0	158.7	22.9	26.6	9.0	11,385.0	158.7	1,770.7	515.6	182.7	715.1	786.8	101.8	885.6	17,115.0
Other Mfg	47.3	41.3	118.8	35.2	63.2	20.7	11.5	14.0	4.8	39.2	7,525.0	1,651.9	399.3	132.5	460.3	552.2	83.5	813.4	12,013.9
Commerce	150.8	70.7	203.7	41.2	39.3	35.1	10.6	18.9	2.1	94.0	59.3	11,472.0	1,273.4	351.8	1,267.7	1,001.9	94.4	1,013.2	17,199.9
Comms	55.2	53.6	99.8	27.5	20.7	36.8	6.1	11.8	1.2	343.3	33.9	1,072.1	6,513.8	157.6	551.0	759.0	59.4	659.9	10,462.7
Finance	51.2	32.7	127.0	18.3	18.4	17.3	6.1	13.8	1.1	44.1	33.7	1,077.8	453.2	4,350.6	772.9	748.5	61.9	679.1	8,507.7
RE & Biz	58.4	53.7	220.5	30.6	54.5	84.8	10.0	17.4	1.4	68.5	61.8	1,385.4	628.7	204.6	7,328.6	835.1	152.2	786.8	11,982.8
CSPS	109.6	98.7	208.1	43.7	93.2	43.9	15.7	26.8	4.4	309.4	86.5	2,226.5	690.0	230.7	1,205.3	13,057.0	157.2	1,347.4	19,953.4
Construct	59.5	40.8	98.9	52.8	184.5	105.2	20.3	17.5	2.5	44.9	740.8	1,591.5	437.2	154.8	788.7	623.7	12,397.0	763.2	18,124.0
Others	56.9	42.1	90.9	116.6	30.5	19.7	7.6	11.4	1.0	35.8	65.7	1,038.6	324.7	107.6	661.4	691.9	569.0	11,410.0	15,281.6

*Computation based on closed I-O model for 1995.

EMPLOYMENT GENERATED FOR \$1 BILLION INCREASE IN FINAL DEMAND* — 2000

[Exhibit 6]

S\$1 Billion Increase in Final Demand in (Sector)	Increases Overall Employment in (Sector) by														TOTAL				
	Food	Textiles	Paper	Petrochem	Fab Metal	Mach	Electrical	Electronic	Medical	Trans	Other Mfg	Commerce	Comms	Finance		RE & Biz	CSPS	Construct	Others
Food	5,691.2	27.2	223.6	53.7	203.4	49.4	6.0	19.0	4.5	65.4	116.6	2,121.3	567.6	307.3	817.0	440.3	97.4	772.3	11,583.0
Textiles	102.3	10,069.0	119.9	41.0	32.6	30.2	5.5	16.9	2.8	63.0	44.3	1,810.1	581.8	357.5	717.3	458.2	98.6	789.1	15,339.5
Paper	64.6	34.1	7,431.7	61.0	31.3	37.3	7.7	19.2	4.4	67.4	43.2	1,860.7	601.3	323.0	828.3	506.2	109.0	814.2	12,844.6
Petrochem	25.7	12.2	56.7	912.7	51.4	20.9	3.4	8.0	1.6	30.6	30.9	760.8	267.2	177.3	392.9	203.6	53.1	446.8	3,455.7
Fab Metal	56.9	27.3	111.8	42.8	3,725.5	106.6	16.9	64.4	16.7	79.1	222.1	1,691.3	556.9	294.1	755.5	461.2	106.6	768.4	9,104.0
Mach	62.4	36.5	119.1	40.9	137.1	7,788.8	14.1	26.4	16.3	96.3	144.4	1,797.9	643.6	343.1	876.0	511.5	111.3	809.8	13,575.4
Electrical	48.4	23.5	137.8	43.2	159.8	86.4	3,109.8	75.0	11.9	60.5	56.1	1,500.5	485.9	270.2	628.7	380.8	84.2	650.4	7,813.0
Electronic	23.4	19.7	60.3	23.2	39.1	18.8	16.6	1,392.7	3.3	27.1	33.2	744.6	239.7	183.5	337.3	195.4	39.0	300.3	3,697.2
Medical	53.2	24.1	111.7	48.9	99.2	42.0	8.1	39.5	4,955.6	58.3	99.8	1,584.9	531.5	325.0	623.4	406.0	88.1	701.5	9,800.8
Trans	70.8	43.3	119.2	46.5	142.7	256.1	19.3	34.0	19.1	11,389.0	173.6	1,850.2	664.8	386.0	1,018.2	596.1	139.4	957.2	17,925.3
Other Mfg	56.9	36.2	121.8	55.6	71.3	39.0	9.4	17.5	9.0	67.8	7,964.3	1,815.0	559.9	300.7	736.3	478.7	119.6	932.9	13,392.0
Commerce	172.3	56.1	206.3	55.8	44.0	60.2	8.0	21.9	4.1	154.9	55.2	9,489.9	1,572.8	737.9	1,719.0	772.1	130.2	1,093.6	16,354.4
Comms	63.3	45.1	106.1	42.7	25.7	65.4	4.9	14.3	2.5	457.7	35.5	1,126.7	5,687.0	347.2	814.1	618.8	86.5	744.2	10,287.7
Finance	57.7	26.9	141.2	27.5	22.0	31.8	4.8	17.2	2.2	73.2	34.0	1,131.7	613.0	4,867.4	1,167.8	621.1	92.2	779.6	9,711.3
RE & Biz	64.5	44.2	238.1	46.3	63.7	142.4	8.2	21.5	2.9	107.9	60.4	1,447.4	824.5	446.3	9,653.3	663.3	208.7	873.2	14,916.7
CSPS	117.7	78.1	206.8	63.6	105.6	74.2	12.2	31.2	9.2	404.2	84.3	2,202.0	845.7	458.2	1,665.4	11,208.0	212.7	1,427.1	19,206.4
Construct	65.4	32.2	99.5	80.0	210.4	175.1	17.3	21.7	5.2	70.0	624.0	1,662.9	565.2	327.1	1,123.9	464.9	14,123.0	823.3	20,491.2
Others	69.3	35.9	100.0	156.1	39.5	36.9	6.1	14.0	2.2	57.9	66.7	1,152.2	443.9	242.6	986.3	567.5	777.7	12,129.0	16,883.9

*Computation based on closed I-O model for 2000.

EMPLOYMENT GENERATED FOR \$1 BILLION INCREASE IN FINAL DEMAND — 2004

[Exhibit 7]

\$1 Billion Increase in Final Demand in (Sector)	Increases Overall Employment in (Sector) by														TOTAL				
	Food	Textiles	Paper	Petrochem	Fab Metal	Mach	Electrical	Electronic	Medical	Trans	Other Mfg	Commerce	Comms	Finance		RE & Biz	CSPS	Construct	Others
Food	6,255.5	22.5	168.1	58.0	178.7	46.8	4.3	15.4	4.4	85.1	97.8	2,065.6	558.2	310.1	866.9	472.1	67.7	769.7	12,046.9
Textiles	112.4	8,360.0	90.2	44.2	28.7	28.6	4.0	13.7	2.7	81.9	37.1	1,762.5	572.1	360.8	761.1	491.3	68.6	786.4	13,606.9
Paper	71.0	28.3	5,586.7	65.8	27.5	35.3	5.6	15.6	4.3	87.7	36.3	1,811.8	591.3	326.0	878.8	542.8	75.8	811.4	11,002.1
Petrochem	28.2	10.2	42.6	985.0	45.2	19.8	2.5	6.5	1.6	39.9	25.9	740.8	262.8	178.9	416.8	218.3	36.9	445.3	3,507.2
Fab Metal	62.5	22.6	84.0	46.2	3,272.9	100.9	12.3	52.2	16.5	102.9	186.3	1,646.9	547.6	296.8	801.7	494.6	74.1	765.9	8,587.0
Mach	68.5	30.3	89.5	44.1	120.5	7,372.1	10.3	21.4	16.1	125.3	121.2	1,750.7	633.0	346.2	929.5	548.5	77.4	807.0	13,111.5
Electrical	53.2	19.5	103.6	46.7	140.3	81.8	2,264.9	60.8	11.8	78.7	47.0	1,461.1	477.8	272.7	667.1	408.3	58.5	648.2	6,902.1
Electronic	25.7	16.3	45.3	25.1	34.4	17.8	12.1	1,129.5	3.2	35.3	27.9	725.0	235.8	185.2	357.9	209.6	27.1	299.3	3,412.4
Medical	58.5	20.0	84.0	52.8	87.2	39.8	5.9	32.0	4,892.0	75.8	83.7	1,543.3	522.7	328.0	661.4	435.3	61.3	699.1	9,682.8
Trans	77.8	36.0	89.6	50.2	125.4	242.4	14.1	27.6	18.9	14,817.0	145.6	1,801.6	653.8	389.5	1,080.4	639.2	96.9	954.0	21,259.7
Other Mfg	62.6	30.1	91.6	60.0	62.6	36.9	6.8	14.2	8.9	88.2	6,680.7	1,767.3	550.7	303.5	781.3	513.3	83.1	929.7	12,071.5
Commerce	189.4	46.6	155.1	60.3	38.7	57.0	5.8	17.8	4.1	201.5	46.3	9,240.8	1,546.8	744.7	1,824.0	827.8	90.5	1,089.9	16,186.9
Comms	69.6	37.4	79.8	46.1	22.6	61.9	3.6	11.6	2.5	595.5	29.8	1,097.1	5,592.9	350.4	863.8	663.5	60.2	741.7	10,329.8
Finance	63.4	22.3	106.1	29.7	19.3	30.1	3.5	13.9	2.16	95.3	28.5	1,102.0	602.9	4,912.3	1,239.1	666.0	64.1	777.0	9,777.7
RE & Biz	70.9	36.7	179.0	50.0	55.9	134.8	5.9	17.4	2.87	140.3	50.7	1,409.4	810.9	450.4	10,242.8	711.2	145.1	870.3	15,384.6
CSPS	129.4	64.9	155.5	68.7	92.8	70.3	8.9	25.3	9.1	525.8	70.7	2,144.2	831.7	462.4	1767.1	12,017.8	147.9	1,422.3	20,014.6
Construct	71.9	26.8	74.8	86.3	46.8	165.7	12.6	17.6	5.1	91.0	523.5	1,619.3	555.8	330.1	1,192.5	498.49	9,819.9	820.5	16,096.8
Others	76.2	29.8	75.2	168.5	34.7	34.9	4.5	11.3	2.2	75.3	55.9	1,121.9	436.6	244.8	1,046.6	608.5	540.8	12,088.3	16,655.9

SHARE OF OWN, MANUFACTURING AND SERVICES SECTORS JOBS AND PERCENTAGE CHANGE IN SHARE OF JOBS CREATED ARISING FROM A CHANGE IN FINAL DEMAND IN EACH INDUSTRY, 1995, 2000 AND 2004

[Exhibit 8]

Increase in Final Demand in	(1) Share of Jobs (%) Created in 1995			(2) Share of Jobs (%) Created in 2000			(3) Share of Jobs (%) Created in 2004			(4) Change in Share of Jobs (%) Created in (1995 and 2000) [Column (2) – Column (1)]			(5) Change in Share of Jobs (%) Created in (2000 and 2004) [Column (3) – Column (2)]		
	Own Industry	Mfg Sector	Services Sector	Own Industry	Mfg Sector	Services Sector	Own Industry	Mfg Sector	Services Sector	Own Industry	Mfg Sector	Services Sector	Own Industry	Mfg Sector	Services Sector
Food	40.8	16.0	35.7	39.9	15.9	36.7	42.2	15.4	35.5	-0.9	-0.2	1.0	2.3	-0.5	-1.3
Textile	69.5	10.1	16.6	55.9	12.8	25.6	52.3	12.4	29.0	-13.6	2.7	9.0	-3.6	-0.4	3.5
Paper	59.3	5.5	28.6	54.7	6.1	32.1	48.0	6.3	37.7	-4.6	0.6	3.4	-6.7	0.2	5.7
Petrochem	38.7	8.6	40.8	22.1	11.3	52.1	23.5	11.0	51.8	-16.7	2.7	11.3	1.4	-0.4	-0.3
Fab Metal	43.8	11.3	36.3	36.7	12.4	41.3	34.2	11.9	44.1	-7.0	1.1	5.0	-2.5	-0.5	2.9
Mach	58.4	7.6	27.7	53.3	9.2	30.7	52.2	9.0	32.1	-5.2	1.6	3.0	-1.07	-0.3	1.4
Electric	49.5	8.4	34.1	38.9	9.9	41.8	32.1	10.1	47.6	-10.7	1.5	7.7	-6.8	0.2	5.8
Electronic	53.8	7.0	32.5	35.7	9.2	46.0	31.3	8.9	50.2	-18.1	2.2	13.5	-4.3	-0.3	4.2
Medical	62.3	5.1	26.5	49.9	6.6	35.4	49.9	6.2	36.1	-12.4	1.6	9.0	0.0	-0.4	0.6
Trans	54.5	16.6	23.2	49.9	18.8	25.2	54.8	18.8	21.5	-4.6	2.2	2.0	4.8	0.1	-3.7
Other Mfg	55.0	11.0	26.6	52.7	10.4	29.1	49.1	10.1	32.4	-2.2	-0.6	2.5	-3.7	-0.3	3.4
Commerce	54.7	4.2	34.6	45.2	5.1	42.2	44.5	5.1	43.2	-9.5	0.9	7.6	-0.7	-0.1	1.0
Comms	51.8	6.6	34.8	41.5	8.4	42.1	40.6	9.3	42.3	-10.3	1.8	7.3	-0.9	0.9	0.3
Finance	44.2	4.3	42.9	36.6	4.5	50.0	36.6	4.2	50.5	-7.6	0.2	7.1	0.1	-0.3	0.6
RE & Biz	51.8	5.5	34.9	54.0	5.4	33.4	55.6	4.8	33.0	2.2	-0.2	-1.5	1.6	-0.5	-0.4
CSPS	57.4	5.2	29.8	52.0	6.2	33.3	53.5	6.1	32.6	-5.5	1.0	3.5	1.5	-0.1	-0.7
Construct	68.0	7.6	19.8	68.5	6.8	20.2	60.6	7.8	26.1	0.4	-0.7	0.4	-7.9	1.0	5.9
Others	66.8	3.1	18.5	64.0	3.5	20.1	64.7	3.4	20.8	-2.9	0.3	1.6	0.7	-0.1	0.7