
**Growth in Singapore's
Export Markets, 1991-96:
A Shift-Share Analysis**

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**GROWTH IN
SINGAPORE'S EXPORT MARKETS, 1991-96:
A SHIFT-SHARE ANALYSIS**

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EXECUTIVE SUMMARY

1 Singapore's total exports have seen rapid growth over the last three decades, reflecting the outward orientation of the economy and strong growth in world trade. But given the openness of the economy, the spatial pattern and composition of Singapore's exports are susceptible to changes in regional and global economic trends. This paper employed the methodology of shift-share analysis to examine the trends in Singapore's export market growth over 1991-96. Exports data at the 3-digit Standard Industrial Trade Classification (SITC) are from *Singapore Trade Statistics: Imports and Exports* compiled by the Singapore Trade Development Board (TDB [various issues]), which do not include trade with Indonesia. Markets which saw an increase in exports greater than that implied by Singapore's overall export growth rate are said to have experienced **positive net shifts** in exports, and conversely for **negative net shifts**. These shifts in exports are then decomposed into sources of divergence, namely, **industry mix effect**, **regional effect**, and **interaction effect**, from which implications for Singapore's conduct of international trade could be drawn.

2 **Industry Mix Effect** captures that portion of the export divergence that is due to the difference between a country's composition of exports to a market and the composition of that country's total exports. A positive (negative) effect results when the proportion of exports to a market in fast growing commodities is greater (smaller) than the proportion of the country's overall exports in these commodities. **Regional Effect** measures the effect of differential growth of various export commodities to a market compared to other markets. **Interaction Effect** measures that portion of the net shift due to the difference in mix of commodity exports to the various markets interacting with the difference in growth of commodity exports to these markets.

Best and Worst Performing Export Markets

3 Our analysis showed that Malaysia recorded the largest positive net shift for Singapore's exports from 1991-1996, followed by Hong Kong, China, Ireland and France. At the other end of the scale, the US, Germany, Thailand, Italy and Japan had, in that order, the largest negative net shifts. Export markets with positive net shifts increased their share of Singapore's total exports, and conversely for those with negative net shifts.

4 On a regional level, Singapore's exports to ASEAN-5 (i.e. Malaysia, Thailand, the Philippines, Brunei and Myanmar) posted the largest positive net shift. This reflects the increasing importance of the ASEAN countries as Singapore's export markets. After ASEAN-5, the East Asian market of China, Hong Kong, Japan, South Korea and Taiwan experienced the next largest positive net shift. On the other hand, Singapore's exports to the North American market – the US and Canada – experienced the largest negative net shift, followed by the European Union.

Export Performance by Commodity Section

5 A decomposition of Singapore's net shifts in exports by commodity revealed that Singapore's strong export performance in Malaysia, Hong Kong, China, Ireland and France was underpinned by the rapid growth in exports of machinery & transport equipment (SITC 7), comprising largely electronics, to these countries. Even among the five export markets with the largest negative net shifts, viz. the US, Germany, Thailand, Italy and Japan, Singapore's exports of machinery & transport equipment grew faster than its overall export growth except in Germany and Italy.

6 Within the SITC 7 category, exports of office & data machines (SITC 75), and electrical machinery (SITC 77) were largely responsible for the positive net shifts. The strong growth in electronics exports to these five markets reflected Singapore's favourable industrial structure that was skewed towards an industry experiencing rapid growth over the last several years.

7 Singapore's exports of mineral fuels (SITC 3), comprising primarily refined petroleum products, did not grow as fast as its overall exports. With the exception of China, Hong Kong and Ireland, all the other markets registered a negative net shift, reflecting the state of an industry beset by over-capacity and low refining margins. Singapore faces increasing competition from South Korea and the Middle East, notably Saudi Arabia. Moreover, increased import-substitution by Thailand and Malaysia has limited Singapore's exports to these countries.

8 Exports of chemicals and related products (SITC 5), in general, also grew slower than Singapore's overall exports. Among the ten major export markets, the US experienced the largest negative net shift, followed by Malaysia and Japan. However, with projected healthy growth and capacity expansion for the

industry over the next few years, its exports could well assume increasing importance.

Sources of Divergence in Export Market Performance

9 A decomposition of the net shifts in exports into the various sources of divergence revealed some important observations. First, the industry mix effect in all ten markets was almost invariably negative in every 1-digit SITC commodity section exports except SITC 7. This was due to the concentration of Singapore's total exports in SITC 7 commodity and its much faster growth vis-à-vis the other commodities over 1991-96. Second, with few exceptions, the interaction effects of the net shifts in 1-digit SITC exports were negative and usually associated with positive regional effects of a similar order of magnitude. This arose when exports to a market were not concentrated in those commodities with faster than average overall export growth

10 The significant positive net shift recorded in **Malaysia** was due, in aggregate, to the strong positive regional effect which more than offset the negative interaction effect. Singapore's exports of transport and machinery equipment (SITC 7) saw the greatest positive net shift in Malaysia, reflecting its increasing importance as Singapore's market for electronics exports. Nonetheless, the composition of exports to Malaysia in the 1991 base period was not as favourably predisposed compared to the overall export structure. As a result, Singapore's exports to Malaysia recorded negative interaction effects in almost every 1-digit SITC commodity, and small positive industry mix effect overall.

11 Singapore's sizeable positive net shift in **Hong Kong** was underpinned mainly by the solid performance of electronic valves (SITC 776) and telecommunications equipment (SITC 764). As evidenced by its large positive industry mix effect, the net shift in SITC 776 exports was due primarily to the rapid growth in Singapore's exports of the commodity, rather than from differential in export growth to Hong Kong vis-à-vis the other markets. On the other hand, growth in Singapore's exports of SITC 764 to Hong Kong was derived mainly from the greater demand in Hong Kong relative to the other export markets.

12 **China** was one of Singapore's fastest growing markets, as reflected by the significant positive regional effects in all 1-digit SITC category exports except SITC 4. Exports of transport and machinery equipment (SITC 7) accounted for

close to two-thirds of the positive net shifts in Singapore's total exports to China. In particular, exports of parts for office & data processing machines (SITC 759) to China expanded significantly faster than that to Malaysia and Hong Kong.

13 Singapore's performance in the **US** market was adversely affected by the decline in exports of all 1-digit SITC commodities except for transport & machinery equipment (SITC 7). Exports of miscellaneous manufactured articles (SITC 8), which comprised mainly articles of apparel and clothing accessories (SITC 84), experienced the largest absolute decline over 1991-96. The positive net shift in exports recorded for transport & machinery equipment (SITC 7) was largely due to the strong concentration in electronics valves (SITC 776), and data processing machines and parts (SITC 752-9) in Singapore's electronics exports to the US. But reflecting the slower growth in Singapore's SITC 7 exports to the US vis-à-vis the world, the regional effect of the net shift in Singapore's SITC 7 exports to the US was significantly negative.

14 Among the major industrial markets, **Germany** was one of the worst performers. Although Singapore's exports to Germany experienced a smaller overall negative net shift than that to the US, it was the only market where Singapore had posted negative net shifts in all categories of exports at the 1-digit SITC level. This portend the decline of Germany as one of Singapore's key export markets.

15 Growth of Singapore's exports to **Thailand** was dragged down by our over dependence on exports of refined petroleum products (SITC 334), whose growth had contracted sharply in recent years. In contrast, exports of data processing machines (SITC 752), electronic valves (SITC 776) and telecommunications equipment (SITC 764) performed well as Thailand remains an important production base for electronics products, with significant intra-industry trade linkages with Singapore.

16 The overall negative net shift in Singapore's exports to **Japan** reflected the poor export performance in refined petroleum products (SITC 334) and beverages and tobacco manufactures (SITC 1). As in the case of Thailand, Singapore's exports of refined petroleum products to Japan saw large absolute decline over 1991-96. Nonetheless, Singapore's SITC 7 exports to Japan performed well, achieving one of the highest growth among the industrial markets.

Trends in Singapore's Domestic Export Growth

17 To supplement our analysis of Singapore's total exports, the same shift-share technique was applied to its *domestic* exports. We found that the results were generally similar to our earlier conclusions on total exports, with a few important differences. First, while Malaysia and Hong Kong remained Singapore's top two markets for domestic export in terms of positive net shifts, Ireland is now elevated to the 3rd position, underlining its significance as Singapore's trading partner. Second, instead of the US, Thailand recorded the largest negative net shift for Singapore's domestic exports, reflecting the weaker performance of our domestic exports to Thailand compared to re-exports. Third, unlike our earlier analysis, Singapore's domestic exports to Japan experienced a favourable net shift. The different outcomes reflected the poorer performance of Singapore's re-exports to Japan relative to its domestic exports.

Singapore's Exports & Overseas Investment

18 In recent years, Singapore's outward direct investments in the region have grown strongly, in line with the government's regionalisation effort aimed at creating an external wing for the Singapore economy to boost its foreign-source income. It is also consistent with the trend towards a transnational network of production facilities in the region to take advantage of the respective countries' comparative advantages. In this regard, it is interesting to note that the regional countries in which Singapore's exports recorded significant positive net shifts were also major recipients of its overseas investments. Three of Singapore's export markets with the largest positive net shifts, namely Malaysia, Hong Kong and China, were among the most popular destinations for Singapore's direct investments abroad.

Implications & Conclusion

19 A number of significant implications on the Singapore economy could be drawn from the analyses. First, the government's decision to focus on the promotion of electronics industries was well justified by the fact that export growth of Singapore in recent years was largely driven by the impressive performance of electronics exports. While many have argued that Singapore's heavy dependence on the electronics industry has increased the economy's vulnerability to swings in the electronics cycle, it is almost certain that Singapore would not have achieved such high export growth if not for electronics exports. The key to sustaining robust export expansion will be continued emphasis on high growth sectors such as high-end disk drives and semiconductors.

20 Second, while electronics would remain the mainstay of Singapore's export engine, industries such as chemicals and related products (SITC 5), and mineral fuels, lubricants and related materials (SITC 3), and miscellaneous manufactured articles (SITC 8) should not be overlooked. As these products accounted for a significant 23% of our total exports in 1996, higher growth could be obtained if greater efforts were made to expand their share in selected markets where Singapore had a competitive advantage.

21 Third, while Singapore faces intense competition from the region in its exports to the developed markets, it has also benefited greatly from exporting to the regional economies. While the recent regional currency crisis may affect the short-term growth prospects of some regional economies, the long-term prospects for the region remain favourable. Nevertheless, the uncertainty surrounding the region has underscored the importance for Singapore to diversify its export base by reaching out to growth areas outside the region.

22 Fourth, the need for Singapore to explore new export destinations was further heightened by the diminishing significance of the US, Japan and the EU as its export markets. While Singapore has made some headway in penetrating into some non-traditional markets, its trading relations with a number of emerging markets remain superficial. Trading opportunities in other less familiar markets should be identified and exploited to further boost Singapore's export performance.

23 Finally, the regionalisation of the Singapore economy, with the attendant relocation of industries to countries in the region, has not led to a

hollowing-out of Singapore's manufacturing sector, nor has it adversely affected export market growth. In fact, Singapore's exports are increasingly directed at markets where Singapore has heavily invested. In this regard, Singapore's regionalisation effort has been beneficial and initiatives such as the Singapore-Johor-Riau Growth Triangle, which exploits the different comparative advantages of the regional economies, should be promoted in order to attract investments of higher quality into Singapore.

1 INTRODUCTION

1.1 Singapore's total exports have grown at a rapid rate over the last three decades, reflecting the outward orientation of the economy and strong growth in world trade. During 1965-96, Singapore's total exports expanded by 15% p.a. while world trade grew by 12% p.a.. Over the same period, Singapore's economic growth, which has been largely export-led, averaged 9% p.a. over the last 30 years or so. Given the openness of the economy, with trade amounting to 3 times nominal GDP, the spatial pattern and composition of Singapore's exports are susceptible to changes in regional and global economic trends. In recent years, several major developments have taken place that may have an impact on Singapore's exports, both in terms of the direction and mix of exports.

1.2 First, the trend towards greater industrialisation among the other emerging Asian economies has led to an increase in competition facing Singapore's exports. Besides its traditional export competitors of Hong Kong, Taiwan and Korea, Singapore is expected to face increasing competition from the regional economies, in particular Malaysia, in its exports to the major markets of the US, Japan, and the EU.

1.3 Second, there has been a trend towards greater regional economic integration even as countries in the region compete in exporting to third-country markets. This is reflected in the rise of intra-Asian trade, which has grown by 16% p.a. over the past 10 years. To the extent that Singapore's penetration into Asian markets reflects a diversification of its export base, the relative performance of Singapore's exports to Asia vis-à-vis that to its traditional markets such as the US would be of significance.

1.4 Third, in contrast to the booming Asian economies, many OECD countries had recorded sluggish growth performance in recent years. Extended recession in Japan and some European economies, such as France and Germany, could have had an adverse impact on Singapore's exports to these markets, thereby changing its overall patterns of trade.

1.5 Finally, following the regionalisation of the Singapore economy since the early 1990s, there has been an increase in the number of Singaporean firms investing overseas. While the nexus between trade and investment can be rather complex, Singapore's greater investment linkages with the region could lead to increased trade flows to and from the region.

1.6 This paper examines the trends in Singapore's export market growth over 1991-96 against the backdrop of developments we have just described. The methodology of shift-share analysis is used to identify which export markets are of growing significance to Singapore, and which are diminishing over time. Exports data at the 3-digit Standard Industrial Trade Classification (SITC) are from *Singapore Trade Statistics: Imports and Exports* compiled by the Singapore Trade Development Board (TDB [various issues]), which do not include trade with Indonesia. Markets which saw an increase in exports greater than that implied by Singapore's overall export growth rate are said to have experienced **positive net shifts** in exports, and conversely for **negative net shifts**. These shifts in exports are then decomposed into their various sources of divergence from which policy implications for Singapore's conduct of international trade could be drawn.

1.7 Section 2 of the paper gives a brief exposition of the shift-share technique used for our analysis. Sections 3 and 4 look at the trends in Singapore's export market growth and its export performance by commodity respectively. Section 5 examines the sources of divergence in export performance in each of our major export markets. Section 6 presents an analysis of Singapore's *domestic exports* growth using the same shift-share technique. Section 7 examines the relationship between Singapore's overseas investment and exports. Section 8 concludes with some policy implications for Singapore.

2 METHODOLOGY OF SHIFT-SHARE ANALYSIS

2.1 Shift-share analysis is a well-established methodology in regional economic analysis where it has been used to examine issues such as export market growth, industrial structure, employment changes and labour productivity. For example, it was used in the study of export market growth in Malaysia (Khalifah [1996]), export competition among selected economies in East Asia (Herschede [1991]), labour productivity in US manufacturing (Ledebur and Moomaw [1983]), and regional economic growth in the US (Hayward [1995]). The technique of shift-share analysis provides a very simple decomposition that lends itself to some meaningful economic interpretation.

2.2 When applied to the study of export market growth of a country, shift-share analysis measures the relative size of the gains or losses of export markets relative to the overall export growth – termed the **overall growth** or **share effect** – of that country. The resultant **net shifts** in exports are better measures of export market performance than the more commonly used measures such as **absolute** and **relative changes** in exports. Absolute changes in exports tend to obscure the differential growth rate of markets as they overstate the importance of larger vis-à-vis smaller markets, while relative or percentage changes in exports tend to have the opposite bias. For example, when comparing between the US and Laos as Singapore's export markets, the absolute increase in exports to the former is expected to be considerably larger than that to the latter as the US is a much bigger market. For the same reason, the growth of Singapore's exports to the US would be expected to be smaller than that to Laos. The shift-share technique overcomes these limitations by taking into account both the size and growth of a particular market when assessing its export performance vis-à-vis another market.

2.3 **Net shifts** in export markets can be attributed to the following three possible sources of export divergence: (a) **industry mix effect**, (b) **regional effect**, and (c) **interaction effect**. The latter two effects are also

collectively termed the "**competitiveness**" effect. Appendix 1 provides a more formal derivation of the above decomposition.

2.4 **Industry Mix Effect** captures that portion of the export divergence that is due to the difference between the composition of exports to a market and the composition of the country's total exports. A positive effect results when the proportion of exports to a market in fast growing commodities is greater than the proportion of the country's overall exports in these commodities. A negative effect results when exports to a market are dominated by slow growing commodities vis-à-vis the composition of total exports. For example, if the share of Singapore's electronics exports, a high-growth commodity, to the US is greater than that of Singapore's total exports, the industry mix effect of Singapore's net shifts in exports to the US will be positive.

2.5 **Regional Effect** measures the effect of differential growth of various export commodities to a market compared to other markets. Thus, while the mix of exports to two markets may be the same, the difference in growth rates of individual commodity exports between the markets can contribute to a net shift in export market shares. Positive regional effect occurs when the rates of growth in exports of various commodities to a market are higher than the country's overall export growth in these commodities, and vice versa for negative regional effect. For example, if the growth of Singapore's electronics exports to the US is higher than that of Singapore's total electronics exports, the regional effect in the US will be positive.

2.6 **Interaction Effect** measures that portion of the net shift due to the difference in *mix* of commodity exports to the various markets interacting with the difference in *growth* of commodity exports to these markets. A positive effect results when exports to a market are either (a) concentrated in those commodities with faster than average overall export growth or (b) not concentrated in those with slower than average overall export growth. For example, the interaction effect in the US will be positive if the share of

Singapore's electronics exports to the US is greater than that of Singapore's total exports and, at the same time, the growth of Singapore's electronics exports to the US is higher than that of Singapore's total electronics exports.

2.7 A closely related methodology, which is also frequently used in the study of export growth, is Constant Market Share (CMS) analysis. However, CMS has a number of weaknesses compared to the shift-share analysis. (See, for example, Richardson (1971) for a detailed discussion of the limitations of the CMS model.) The shift-share technique, on the other hand, is not without its problems. The main weakness is that the results of the analysis are influenced by the type of industrial classification used such that the relative magnitudes of the three sources of export divergence vary with different levels of disaggregation. The chosen level of aggregation is usually dictated by the available data. In addition, as in the case of CMS analysis, the shift-share technique only quantifies the sizes of the various effects without explaining why the particular effects come about.

2.8 Notwithstanding its limitations, the shift-share model is a simple but effective tool for disaggregating the components of export market growth.¹ The findings of the shift-share analysis in this paper will illuminate our understanding of Singapore's trade patterns. In order to keep the analysis to manageable proportions, the paper focuses on Singapore's top five positive and negative net shifts markets.

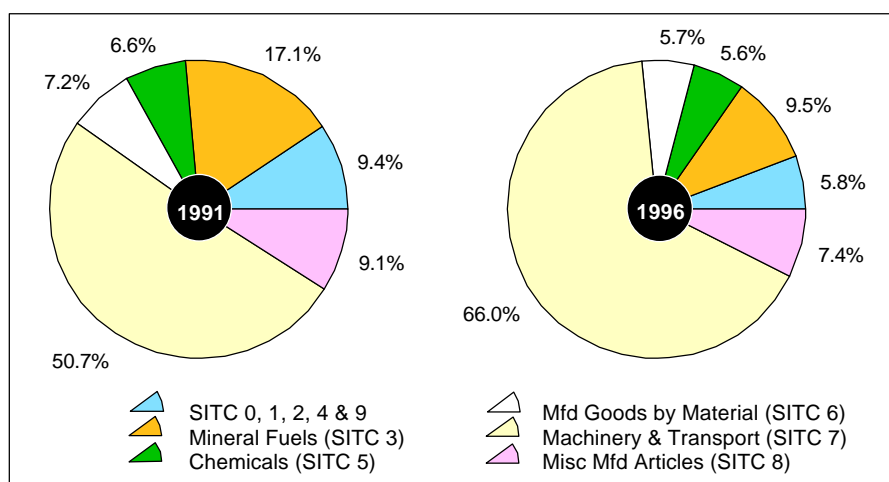
¹ In a study on regional growth in UK, the Shift Share technique has also proven to be "robust" in comparison with other methodologies (Fothergill and Gudgin 1979).

3 TRENDS IN SINGAPORE'S EXPORT MARKET GROWTH

Export Structure and Key Markets

3.1 As shown in Chart 3.1, the composition of Singapore's exports is highly skewed toward the transport and machinery equipment (SITC 7) category, particularly electronics products.² This reflects the government's active promotion of the electronics industry, and strong growth in global electronics demand during the last few years. With growth averaging 17.6% p.a., the share of SITC 7 exports expanded from 50.7% in 1991 to 66.0% in 1996. This was largely at the expense of mineral fuels (SITC 3), the second largest export category, whose share in Singapore's total exports declined from 17.1% to 9.5% over the same period. Indeed, exports of mineral fuels saw a slight absolute decline between 1991 and 1996.

Chart 3.1
Singapore's Total Exports by Commodity Section

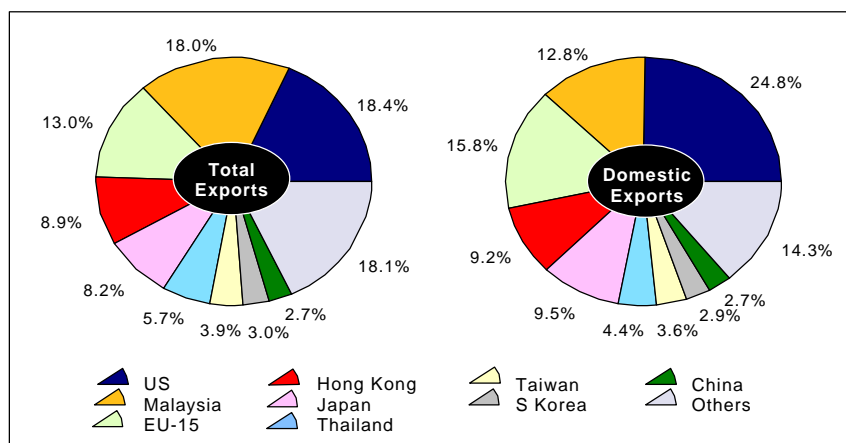


3.2 Of Singapore's export markets, the US remains the largest, reflecting its importance as the world's largest market for electronics products and the large presence of US multi-national corporations (MNCs) in Singapore. In 1996, the US accounted for 18.4% of Singapore's total exports, compared to 18.0% for Malaysia. (See Chart 3.2.) However, in terms of domestic exports, the US was a much more significant market,

² Electronics exports consist of office and automatic data processing machines (SITC 75), telecommunications and sound recording equipment (SITC 76), electrical machinery and apparatus (SITC 772 and 778) and electronic valves (SITC 776). They accounted for 84% of Singapore's total SITC 7 exports in 1996.

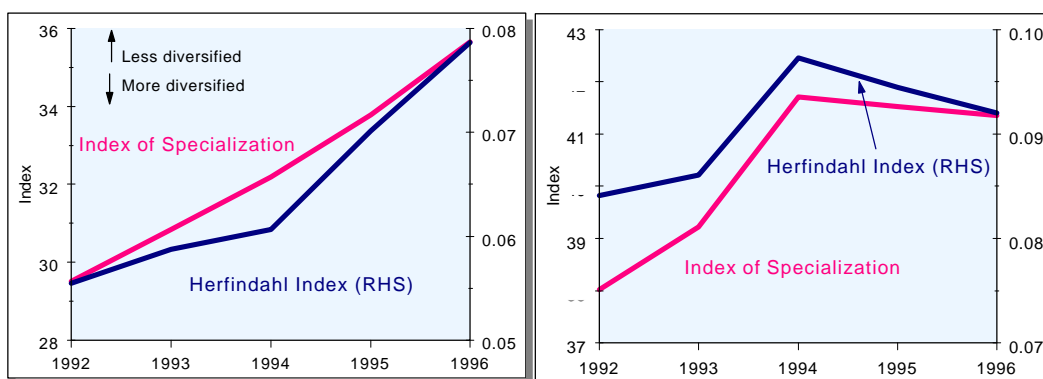
absorbing 24.8% of Singapore's total domestic exports, or almost twice Malaysia's share of 12.8%. This suggests that Singapore handled a greater volume of entrepot trade with the regional countries compared with the more distant countries such as the US and Japan. For example, re-exports accounted for 57.2% of Singapore's total exports to Malaysia and Thailand in 1996, substantially higher than the 24.4% with the US and Japan.

Chart 3.2
Singapore's Key Export Markets, 1996



3.3 Chart 3.3 shows that there has also been a relative increase in concentration of Singapore's exports in terms of both commodity and market in recent years.

Chart 3.3
Diversification of Singapore's Exports³
(a) By Commodity **(b) By Markets**

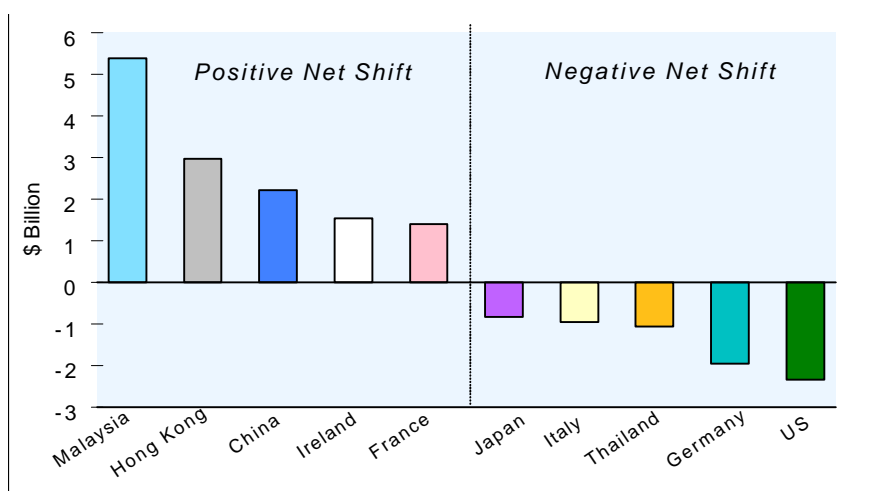


³ The Index of Specialisation (IS) and Herfindahl Index (HI) are computed as follows:
 $IS = 100 \{1 + \frac{\sum [S_i \cdot \ln(S_i)]}{\ln(\sum S_i)}\}$, $0 \leq IS \leq 100$
 $HI = \frac{\sum (S_i)^2}{(\sum S_i)^2}$, $0 \leq HI \leq 1$
 where S_i = share of exports of i th commodity or exports to i th market. In both cases, an index close to zero indicates a high degree of diversification, whereas a large index indicates a high degree of concentration or specialisation.

Best and Worst Performing Export Markets

3.4 Chart 3.4 presents the five markets which experienced the largest positive net shifts and another five with the largest negative net shifts in exports over 1991-96. Among the top 5 performing markets, Malaysia recorded the largest positive net shift of \$5.4 billion. In other words, Singapore's exports to Malaysia in 1996 were \$5.4 billion more than what they would have been if they had grown at the same rate as Singapore's overall exports during 1991-96. This was followed by Hong Kong (\$3.0 billion), China (\$2.2 billion), Ireland (\$1.5 billion) and France (\$1.4 billion) in that order.⁴ (Appendix 2 lists all Singapore's export markets in descending order of net shifts in exports.)

Chart 3.4
Top Five Positive and Negative Net Shift Markets



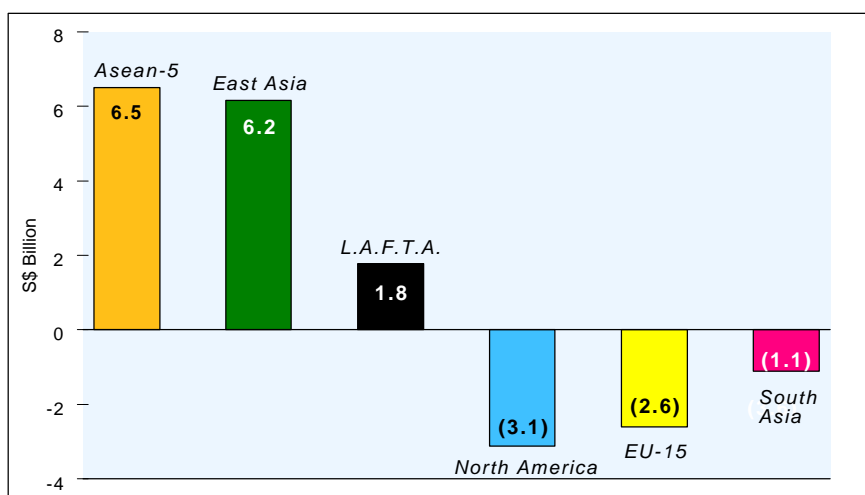
3.5 At the other end of the scale, the US (-\$2.3 billion), Germany (-\$2.0 billion), Thailand (-\$1.1 billion), Italy (-\$0.9 billion) and Japan (-\$0.8 billion) had, in that order, the largest negative net shifts. Export markets with positive net shifts increased their share of Singapore's total exports, and conversely for those with negative net shifts. Thus, the share of Malaysia, Hong Kong, China, Ireland and France in Singapore's total exports rose from 25.1% in 1991 to 32.7% in 1996, while the share of US, Germany, Thailand, Italy and Japan fell from 39.9% to 35.8%.

⁴ Figures in parentheses refer to net shifts.

Regional Market Performance

3.6 On a regional level, Singapore's exports to ASEAN-5⁵ posted the largest positive net shift of \$6.5 billion, with Malaysia alone accounting for close to 83% of this net shift. (See Chart 3.5.) This reflects the increasing importance of the ASEAN countries as Singapore's export markets. Thailand was the only ASEAN market which recorded a negative net shift in exports. As a whole, the share of ASEAN-5 in Singapore's total exports rose from 23.8% in 1991 to 27.5% in 1996. While Malaysia remained Singapore's second largest market in terms of total exports, with its share approaching that of the US, it recorded the largest improvement in market share, from 15.0% in 1991 to 18.0% in 1996.

Chart 3.5
Comparative Net Shifts in Export Markets by Region, 1991-96



3.7 After ASEAN, the East Asian market of China, Hong Kong, Japan, South Korea and Taiwan experienced the next largest positive net shift. This resulted in East Asia's share of Singapore's exports rising from 23.3% in 1991 to 26.7% in 1996. Exports to Hong Kong saw the largest positive net shift (\$3.0 billion), followed closely by China (\$2.2 billion). Only Japan recorded a negative net shift in exports.

⁵ ASEAN-5 refers to Malaysia, Brunei, Thailand, the Philippines, and Myanmar.

3.8 On the other hand, Singapore's exports to the North American market – the US and Canada – posted the largest negative net shift of \$3.1 billion. This was largely due to the \$2.3 billion negative net shift recorded in the US market (Singapore's largest), which saw its share declining from 19.7% in 1991 to 18.4% in 1996. The European Union was the region with the next largest negative net shift. The significant positive net shifts recorded by Ireland and France were not sufficient to offset the large negative net shifts experienced by Germany and Italy, and small negative net shifts in almost all other European Union countries.

3.9 It is also noteworthy that, between 1991 and 1996, Singapore's exports to the Latin American Free Trade Area recorded positive net shifts while those to South Asia saw negative net shifts. Indeed, exports to every country in South Asia posted negative net shifts during the period.

4 EXPORT PERFORMANCE BY COMMODITY SECTION

Strong Electronics Export Performance

4.1 Table 4.1 decomposes Singapore's net shifts in exports to the top and bottom five performing markets by commodity. As evident from the large positive net shifts, Singapore's strong export performance in Malaysia, Hong Kong, China and Ireland was underpinned by the rapid growth in exports of machinery & transport equipment (SITC 7), comprising largely electronics, to these countries. This was particularly so for Malaysia, where the net shift in SITC 7 exports amounted to 155% of the total net shift, followed by 127% for France, 103% for Hong Kong, 97% for Ireland and 63% for China.

Table 4.1
Decomposing Net Shifts by Commodity

(% unless otherwise stated)

SITC	Commodity	Positive Net Shifts					Negative Net Shifts				
		M'sia	Hong Kong	China	Ireland	France	US	Germany	Thailand	Italy	Japan
0	Food & live animals	0.6	-5.7	0.2	0.0	-0.8	-15.8	-5.2	2.3	-1.9	-47.6
1	Beverages & tobacco	0.9	-6.1	19.1	0.0	0.0	-0.4	-0.2	-0.5	0.0	-134.5
2	Crude materials, except fuels	-4.1	-3.4	-4.2	-0.1	-1.2	-6.9	-5.5	-0.9	-9.0	-33.5
3	Mineral fuels, lubricants	-36.0	12.3	15.7	0.0	-1.6	-11.3	-2.6	-316.5	-3.5	-334.2
4	Animal & veg. oils, fats	-0.6	-0.6	-10.3	0.0	0.0	-0.5	-0.8	0.8	-0.5	-0.4
5	Chemicals & rel. products	-13.4	4.0	-8.1	0.1	4.4	-37.7	-2.9	14.1	1.2	-26.6
6	Manufactured goods by mat'l	-9.9	-3.2	18.6	-0.1	-1.8	-10.1	-6.8	-5.4	-4.2	-41.2
7	Machinery & transpt eqpmnt	155.4	102.9	63.2	96.7	127.3	82.0	-36.2	174.6	-65.8	512.0
8	Misc manufactured articles	6.8	2.5	5.7	3.5	-22.7	-92.3	-36.1	23.2	-16.1	9.9
9	Others	0.4	-2.8	-0.1	0.0	-3.6	-7.0	-3.7	8.2	-0.3	-3.9
	TOTAL	100	100	100	100	100	-100	-100	-100	-100	-100
	Net Shifts (\$ billion)	5.39	2.98	2.22	1.55	1.41	-2.34	-1.96	-1.07	-0.95	-0.83

4.2 Within the SITC 7 category, exports of office & data machines (SITC 75), and electrical machinery (SITC 77) were largely responsible for

the positive net shifts. Office & data machines (SITC 75) comprise mainly disk drives (43%), while electrical machinery (SITC 77) consists primarily of semiconductors (71%). The strong growth in electronics exports to these five markets reflected Singapore's favourable industrial structure that was skewed towards an industry experiencing rapid growth over the last few years. Indeed, SITC 7 exports accounted for 51% and 66% of Singapore's total exports in 1991 and 1996 respectively, growing by 17.6% p.a. during the period, compared to 11.6% p.a. growth for total exports.

4.3 The strong performance in electronics exports to Malaysia was also due to the rapid expansion of the electronics industry there, reflecting the trend towards a regional production network, which had led to increased sourcing of electronic parts and components from Singapore. Trade Development Board's (TDB) estimates show that about 80% of Singapore's non-oil domestic exports to the region comprised intermediate goods.⁶

4.4 Even among the five export markets with the largest negative net shifts, viz. the US, Germany, Thailand, Italy and Japan, Singapore's exports of machinery & transport equipment grew faster than its overall export growth except in Germany and Italy.

Decline in Exports of Mineral Fuels

4.5 Singapore's exports of mineral fuels (SITC 3), comprising primarily refined petroleum products, did not grow as fast as its overall exports. With the exception of China and Hong Kong, all the other markets registered zero or negative net shifts. In fact, Singapore's exports of refined petroleum products (SITC 334) to Thailand, Japan, Malaysia and Italy experienced large absolute declines over 1991-96, reflecting the state of an industry beset by over-capacity and low refining margins. Singapore faces increasing competition from South Korea and the Middle East, notably Saudi Arabia. In particular, refining capacity in South Korea almost doubled between 1991-96. From a position lower than Singapore's in 1991, South

⁶ See *The Straits Times*, 21 January 1998.

Korea had overtaken Singapore by 1996, with a refining capacity of 1.8 trillion bpd compared to Singapore's 1.2 trillion bpd. This is of particular significance, considering the fact that South Korea is much closer to Japan and China, two major markets for refined petroleum products in East Asia.

4.6 In addition, increased import-substitution by Thailand and Malaysia has also limited Singapore's exports to these countries. Indeed, Singapore's exports of refined petroleum products to Thailand have been on a trend decline since 1991.

Weak Performance in Chemicals and Related Products

4.7 Exports of chemicals and related products (SITC 5), in general, also grew slower than Singapore's overall exports despite the industry being actively promoted by the government, along with electronics. Among the ten export markets, the US registered the largest negative net shift, followed by Japan and Malaysia. But with projected healthy growth and capacity expansion for the industry over the next few years, its exports could well assume increasing importance. Indeed, following the commissioning of Singapore's second petrochemical complex – PCS II – in Apr 97, both production and nominal exports of chemicals and related products surged, with growth averaging 33.2% and 16.9% YOY respectively in Jun-Nov 97 compared with 17.1% and 3.0% YOY respectively in Jan-May 97. In addition, the postponement or cancellation of some petrochemical projects in the region⁷ amidst the recent currency crisis has alleviated competitive pressures on the petrochemical industry in Singapore.

Broad-Based Decline in Export Performance to Germany

4.8 Germany stood out as the only export market among the ten to which Singapore's exports in every commodity grew slower than average, i.e. negative net shifts. A detailed examination, at 2- and 3-digit SITC levels, shows that only semiconductor exports (SITC 776) to Germany experienced

⁷ For example, National Petrochemical Corp (NPC) and Thai Petrochemical Industry (TPI) have postponed their plans to build ethylene plants, originally scheduled to begin in 1999, indefinitely.

faster-than-average growth. These trends portend, in particular, the decline of Germany as one of Singapore's key export markets. From its position as Singapore's sixth largest export market in 1991 with a 4.2% share, Germany slipped to the seventh position in 1996 when its share declined to 3.1%.

Exports of Telecoms Equipment and Clothing to US Shrank

4.9 Finally, the decline in the US share of Singapore's exports – albeit still the largest – over the 1991-96 period was mainly attributable to the *absolute* decline in exports of telecommunications equipment (SITC 76), and clothing and apparel (SITC 84).

5 SOURCES OF DIVERGENCE IN EXPORT MARKET PERFORMANCE

5.1 This section examines the sources of export divergence in each of the ten markets by decomposing the net shifts in exports into the three effects described in Section 2. These effects are the **industry mix effect** (IME), the **regional effect** (RE) and the **interaction effect** (IE), thus:

Net Shifts in Exports =

Industry Mix Effect + Regional Effect + Interaction Effect

5.2 Table 5.1 summarises the sources of net shifts for the ten export markets at the level of 1-digit SITC commodity section. Several general observations can be made. First, the industry mix effect in all ten markets was almost invariably negative in every 1-digit SITC commodity section exports except SITC 7. This was due to the concentration of Singapore's total exports in SITC 7 commodity (with 51% share in the 1991 base year), and its much faster growth vis-à-vis the other commodities over the 1991-96 period (17.6% vs. 3.6% p.a.). Second, with few exceptions, the interaction effects of the net shifts in 1-digit SITC exports were negative and usually associated with positive regional effects of a similar order of magnitude. This arose when exports to a market were not concentrated in those commodities with faster than average overall export growth, as can be clearly seen when Table 5.1 is compared with Table 5.2 displaying the composition and growth of exports by commodity to the ten markets.

Malaysia

5.3 As noted earlier, Singapore's total exports to Malaysia recorded the largest positive net shift (\$5.4 bn). In addition to a favourable overall regional effect, Singapore's total exports to Malaysia enjoyed a positive overall industry mix effect. This was due largely to the overwhelming positive industry mix and regional effects in Singapore's exports of transport & machinery equipment (SITC 7) to Malaysia. (See Chart 5.1 a.) Underpinning the robust growth in SITC 7 exports to Malaysia

Table 5.1
Sources of Net Shifts in Singapore's Major Export Markets

(a) Positive Net Shifts

(b) Negative Net Shifts

(\$ mil)

SITC	Net Shifts	IME	RE	IE	SITC	Net Shifts	IME	RE	IE
MALAYSIA					US				
0	35	-218	826	-591	0	-370	-264	-38	-67
1	49	-7	117	-61	1	-10	-3	-269	262
2	-222	-251	180	-151	2	-161	-136	-118	92
3	-1,941	-1,740	-200	-1	3	-263	-234	2,708	-2,737
4	-33	-34	18	-17	4	-11	-10	-80	79
5	-724	-370	-142	-211	5	-880	-398	8,587	-9,070
6	-535	-845	837	-527	6	-235	-130	1,732	-1,837
7	8,367	3,885	9,372	-4,889	7	1,914	10,417	-5,555	-2,948
8	366	-44	1,857	-1,448	8	-2,155	-1,723	-223	-208
9	24	-9	-4	36	9	-164	-125	-49	9
Total	5,386	366	12,862	-7,860	Total	-2,335	7,393	6,695	-16,425
HONG KONG					GERMANY				
0	-171	-127	28	-74	0	-103	-76	16	-43
1	-181	-64	7	-124	1	-4	0	-83	78
2	-102	-133	217	-188	2	-108	-76	271	-307
3	366	-1,680	1,163	883	3	-51	-71	158	-138
4	-17	-14	-12	10	4	-15	-8	-15	9
5	120	-66	1,014	-828	5	-56	-20	435	-472
6	-96	-162	276	-211	6	-134	-50	611	-695
7	3,066	1,610	2,377	-929	7	-710	1,249	-895	-1,064
8	76	157	246	-328	8	-708	-387	-231	-90
9	-82	-61	44	-66	9	-72	-23	-49	0
Total	2,980	-538	5,360	-1,855	Total	-1,961	538	218	-2,723
CHINA					THAILAND				
0	5	-25	630	-603	0	25	-42	577	-510
1	425	-1	2,687,112	-2,686,686	1	-5	1	62	-68
2	-93	-143	1,416	-1,373	2	-10	-20	152	-143
3	348	-287	402	232	3	-3,371	-2,006	-524	-840
4	-228	-165	-5	-59	4	9	-12	408	-388
5	-180	-157	383	-410	5	150	-67	372	-154
6	413	-31	3,657	-3,215	6	-58	99	1,510	-1,668
7	1,402	20	8,807	-7,427	7	1,859	1,669	9,828	-9,639
8	127	-2	2,223	-2,095	8	247	28	2,846	-2,628
9	-2	-13	17	-10	9	88	6	418	-337
Total	2,218	-804	2,704,643	-2,701,645	Total	-1,065	-344	15,649	-16,375
IRELAND					ITALY				
0	1	0	5	-5	0	-18	-14	73	-76
1	0	0	0	0	1	0	0	-1	1
2	-2	-2	0	0	2	-85	-83	0	-3
3	0	0	0	0	3	-34	-20	-90	76
4	0	0	0	0	4	-4	-4	-2	1
5	1	0	2	-2	5	12	-2	4,003	-3,990
6	-2	-2	-5	2	6	-40	-20	164	-186
7	1,494	223	617	652	7	-625	129	-371	-384
8	54	-6	252	-197	8	-153	-59	25	-119
9	-1	0	0	0	9	-3	-4	1	-1
Total	1,546	212	871	451	Total	-950	-76	3,801	-4,680
FRANCE					JAPAN				
0	-12	-10	12	-13	0	-396	-350	146	-194
1	0	-2	10	-10	1	-1,121	-510	-163	-448
2	-17	-27	7	2	2	-279	-250	554	-584
3	-22	-25	17	-14	3	-2,785	-1,936	-489	-360
4	0	0	0	0	4	-4	-27	335	-311
5	62	3	550	-542	5	-221	-130	225	-317
6	-25	-10	21	-37	6	-343	-144	1,054	-1,256
7	1,796	95	3,043	-1,342	7	4,267	1,674	8,399	-5,805
8	-321	-196	3	-129	8	82	54	1,248	-1,219
9	-50	-23	-11	-17	9	-33	-97	178	-114
Total	1,411	-195	3,653	-2,101	Total	-833	-1,717	11,487	-10,609

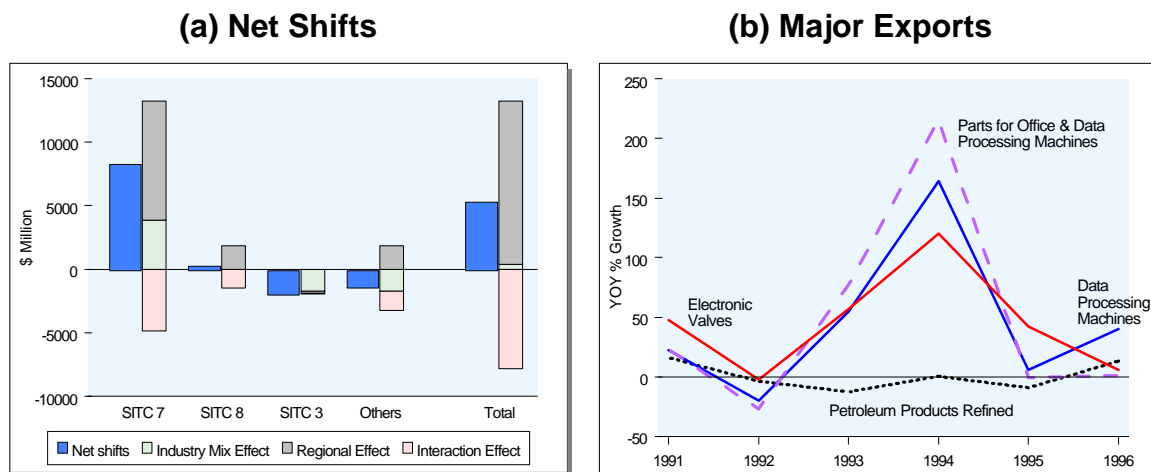
Table 5.2
Structure and Growth of Singapore's Total Exports to Major Markets

COMPOSITION OF TOTAL EXPORTS IN 1991 (%)											
SITC	World	Malaysia	HK	China	Ireland	France	US	Germany	Thailand	Japan	Italy
0	3.0	2.7	3.1	1.9	0.2	1.6	1.6	2.2	1.0	5.9	2.1
1	1.8	0.7	3.5	0.1	0.0	0.1	0.0	0.1	0.2	10.2	0.0
2	2.5	2.1	1.8	8.4	0.8	2.4	0.6	1.8	0.6	3.3	7.9
3	17.1	15.5	29.8	25.7	0.0	2.7	1.5	2.1	40.3	28.5	2.6
4	0.7	0.2	0.2	9.4	0.0	0.1	0.0	0.2	0.2	0.3	0.3
5	6.6	10.2	6.0	26.1	0.2	1.5	4.6	1.4	8.1	4.6	0.9
6	7.2	15.7	5.4	4.2	1.7	2.3	1.5	3.1	7.2	4.7	4.7
7	50.7	45.3	41.0	20.5	88.8	59.7	76.9	72.8	38.1	32.7	67.4
8	9.1	6.4	7.6	2.5	7.6	26.3	12.1	14.9	3.6	7.9	13.6
9	1.4	1.2	1.5	1.1	0.6	3.2	1.1	1.3	0.6	1.9	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ANNUALIZED GROWTH IN TOTAL EXPORTS, 1991-96 (% p.a.)											
SITC	World	Malaysia	HK	China	Ireland	France	US	Germany	Thailand	Japan	Italy
0	1.0	12.6	-0.4	13.9	15.1	1.2	-9.7	-8.9	16.0	-0.6	-3.4
1	7.4	17.1	0.5	213.5	-	7.9	-17.0	-36.4	6.5	-13.4	19.7
2	-4.7	0.7	-0.8	-0.5	-5.7	2.0	-13.8	-19.5	7.9	-4.8	-9.6
3	-0.8	-2.0	13.7	21.5	-	0.8	-3.0	3.3	-15.7	-9.0	-17.1
4	-6.4	-4.0	-9.2	-37.4	7.2	1.8	-21.7	-37.1	18.8	9.4	-31.3
5	8.2	4.8	14.9	4.8	25.5	38.9	-5.0	-4.2	15.1	3.5	25.3
6	6.6	8.5	8.3	52.7	0.2	-3.9	-1.3	-6.1	9.9	-2.2	-3.4
7	17.6	24.1	22.4	44.6	51.0	33.6	13.1	8.5	20.0	26.3	-5.2
8	7.3	16.0	13.3	38.8	33.7	-6.7	-3.3	-9.3	22.9	13.1	-10.8
9	5.2	13.3	-0.4	10.2	5.8	-17.4	-0.2	-14.8	33.1	9.0	3.7
Total	11.6	15.8	16.4	26.4	48.9	23.8	10.0	4.9	9.3	10.3	-5.8
MARKET SHARE OF TOTAL EXPORTS, 1991 & 1996											
YEAR	World	Malaysia	HK	China	Ireland	France	US	Germany	Thailand	Japan	Italy
1991	100	15.0	7.2	1.5	0.3	1.2	19.7	4.2	6.3	8.7	1.0
1996	100	18.0	8.9	2.7	1.1	2.0	18.4	3.1	5.7	8.2	0.4

was the strong performance of electronic valves (SITC 776), which grew by 38% p.a. between 1991-96 and posted a positive net shift of \$4.5 bn. Exports of data processing machines (SITC 759) and parts for office & data processing machines (SITC 752) also did well, with growth averaging 33% and 37% p.a. respectively over the same period. (See Chart 5.1 b.) Singapore's exports of mineral fuels, lubricants and related products (SITC 3) to Malaysia, on the other hand, registered a large negative net shift and, in fact, saw an absolute decline over the 1991-96 period. This reflected

intense international competition in the petroleum refining industry and Malaysia's effort at import-substitution.

Chart 5.1
Singapore's Exports to Malaysia



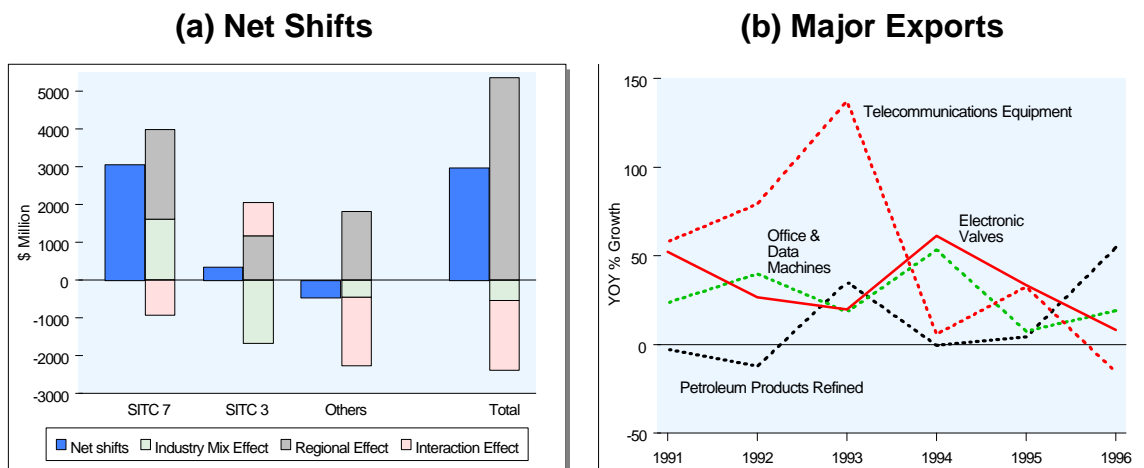
Hong Kong

5.4 Supported mainly by the solid performance of transport and machinery equipment (SITC 7) exports, Singapore's exports to Hong Kong experienced a sizeable positive net shift (\$3.0 bn). (See Chart 5.2 a.) Within the SITC 7 category, exports of electronic valves (SITC 776) recorded the largest increase, followed by telecommunications equipment (SITC 764). As evident in its large positive industry mix effect, the net shift in SITC 776 exports was due primarily to the rapid growth in Singapore's exports of the commodity, rather than from differential in export growth to Hong Kong vis-à-vis the other markets.

5.5 On the other hand, growth in Singapore's exports of telecommunications equipment (SITC 764) to Hong Kong was derived mainly from the greater demand in Hong Kong relative to the other export markets. This is indicated by the larger regional effect recorded for SITC 764 exports, compared with the industry mix effect. In 1991-96, Singapore's exports of SITC 764 to Hong Kong increased by 38% p.a., compared with

15% for Singapore's total exports of the commodity to the world. (See Chart 5.2 b.)

Chart 5.2
Singapore's Exports to Hong Kong

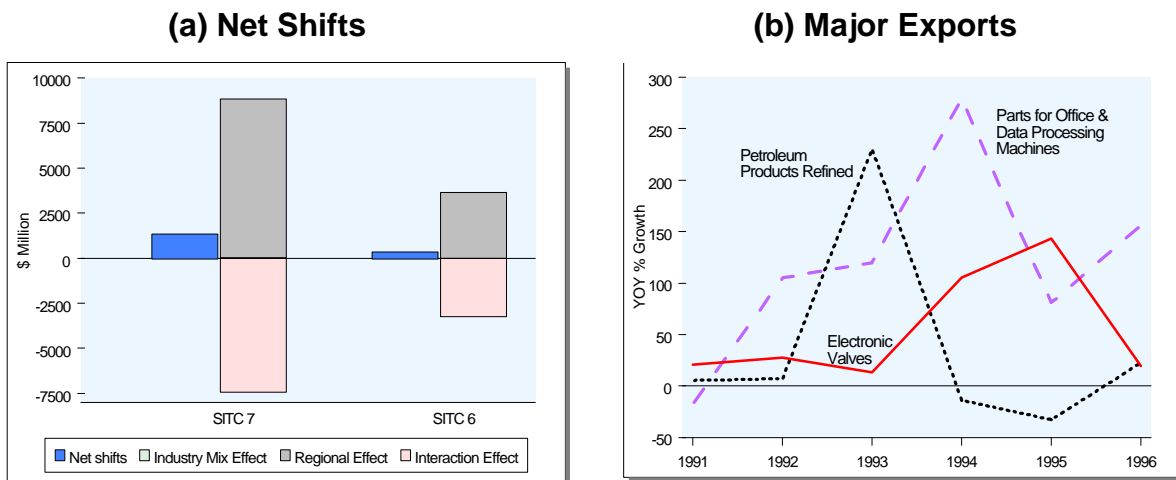


China

5.6 China was one of Singapore's fastest growing markets, as reflected in the significant positive regional effects in all 1-digit SITC category exports except SITC 4. Exports of transport and machinery equipment (SITC 7) accounted for close to two-thirds of the positive net shifts in Singapore's total exports to China. In particular, exports of parts for office & data processing machines (SITC 759) to China saw a phenomenal growth of 140% p.a. over 1991-96, compared to 33% and 29% p.a. to Malaysia and Hong Kong respectively. (See Chart 5.3.) Exports of electronic valves (SITC 776) also performed well, growing by 54% p.a..

5.7 Besides electronics, Singapore's total exports of beverages and tobacco (SITC 1), mineral fuels (SITC 3) and manufactured goods by materials (SITC 6) to China also recorded significant positive net shifts. However, of these three categories of exports, only SITC 3 exports – largely refined petroleum products – consisted mainly of domestic exports, reflecting Singapore's role as a regional petroleum-refining centre. Exports of SITC 1 (largely tobacco products) and SITC 6 (mainly copper) to China, on the other hand, comprised mostly re-exports, attesting to the important role Singapore played as an entrepot trade centre for these products.

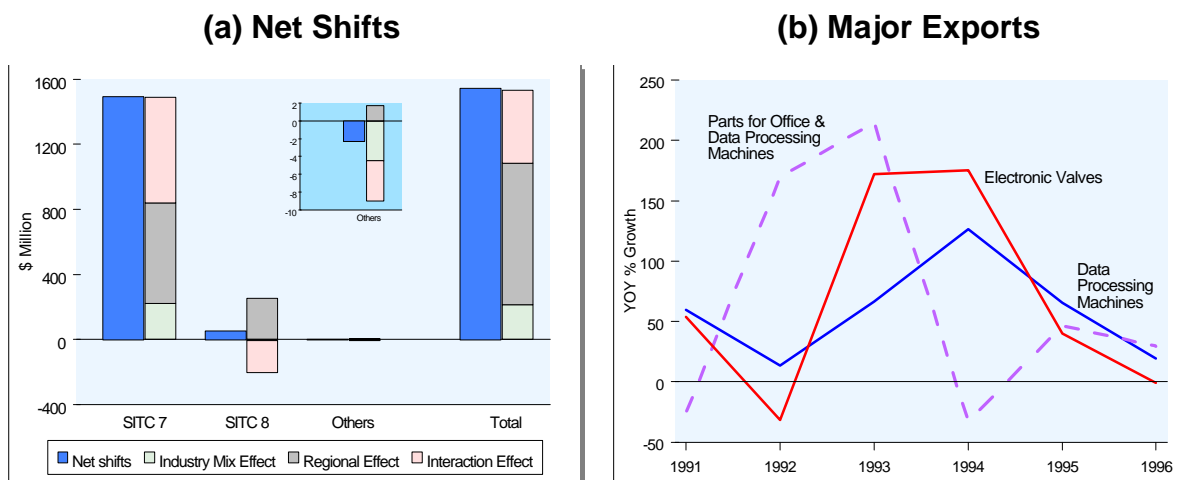
Chart 5.3
Singapore's Exports to China



Ireland

5.8 Singapore's total exports to Ireland were almost entirely concentrated in transport & machinery equipment (SITC 7), with shares of 89% and 95% in 1991 and 1996 respectively. With growth in SITC 7 exports to Ireland being the highest, at 51% p.a. over 1991-96, Singapore's exports to Ireland experienced overall positive effects in all three sources of its net shift in exports. (See Chart 5.4.) Exports of data processing machines (SITC 752) and parts for office & data processing machines (SITC 759) accounted for the bulk of the net shift.

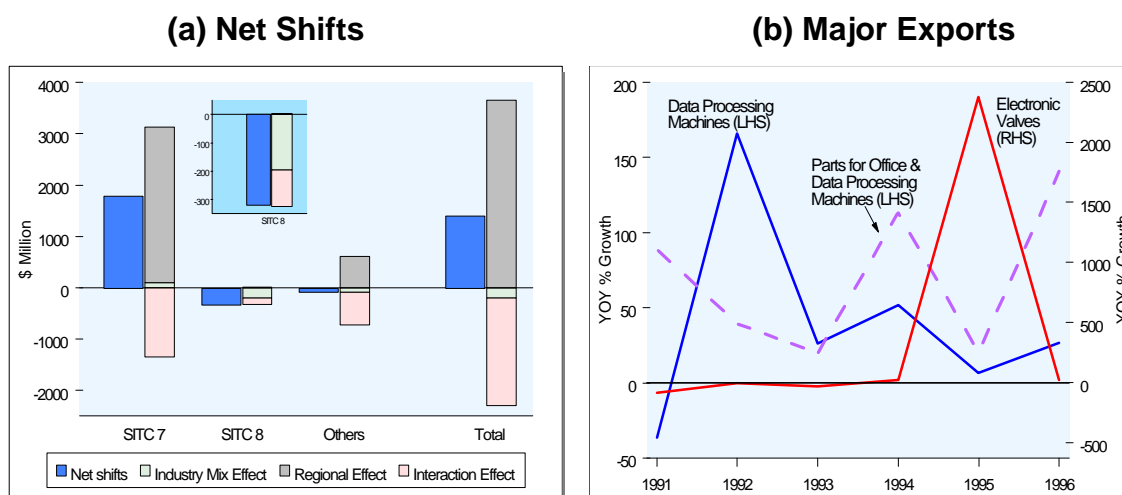
Chart 5.4
Singapore's Exports to Ireland



France

5.9 As in the case of Ireland, transport and machinery equipment (SITC 7) accounted for the largest share of Singapore's exports to France. However, the interaction effect of SITC 7 exports in France was negative, reflecting mainly a lack of concentration in the fast growing exports of electronics valves (SITC 776), which grew by a high 86% p.a. over 1991-96. In particular, the value of electronics valves exports saw a sharp expansion, from just \$24 million in 1994 to \$591 million in 1995 (See Chart 5.5.)

Chart 5.5
Singapore's Exports to France



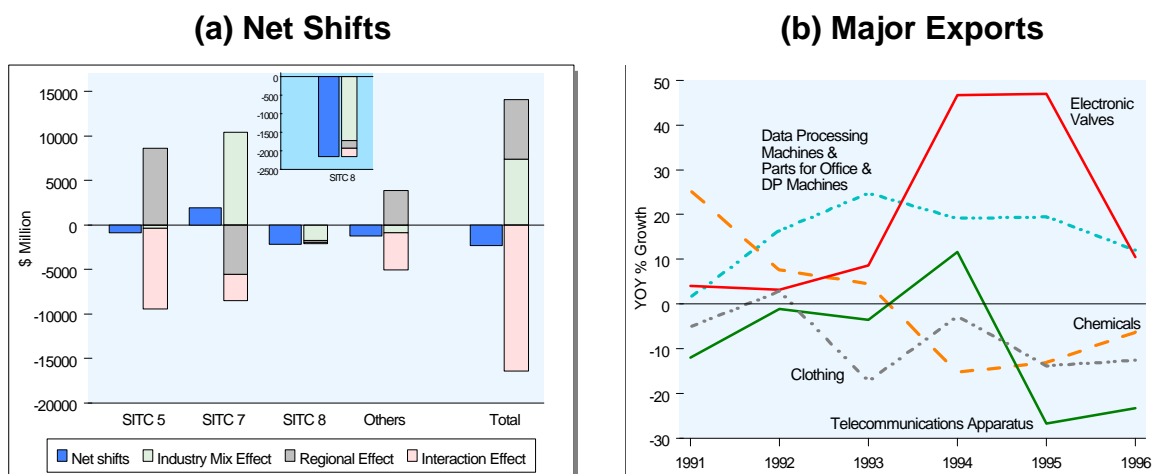
United States

5.10 Singapore recorded the largest negative net shift in its exports to the US, its largest market. Export performance was adversely affected by the decline in exports of all 1-digit SITC commodities except for transport & machinery equipment (SITC 7). In particular, exports of miscellaneous manufactured articles (SITC 8), which comprised mainly articles of apparel and clothing accessories (SITC 84), experienced the largest absolute decline over 1991-96. After clothing and wearing apparel, exports of chemicals and related products (SITC 5) recorded the next largest negative net shift, particularly in organic chemicals (SITC 51).

5.11 The positive net shift in exports recorded for transport & machinery equipment (SITC 7) was largely due to its strong bias in

Singapore's exports to the US. This was underpinned by the strong performance in exports of electronics valves (SITC 776), and data processing machines and parts (SITC 752-9), whose combined growth averaged 19% p.a. for 1991-96 compared to 13% p.a. for Singapore's total SITC 7 exports to the US. (See Chart 5.6.) In contrast, Singapore's exports of telecommunications equipment (SITC 764) and radio receivers (SITC 762) to the US performed the worst, contracting by 10% p.a. in 1991-96. Reflecting the slower growth in Singapore's SITC 7 exports to the US vis-à-vis the world, the regional effect of the net shift in Singapore's SITC 7 exports to the US was significantly negative.

Chart 5.6
Singapore's Exports to the US

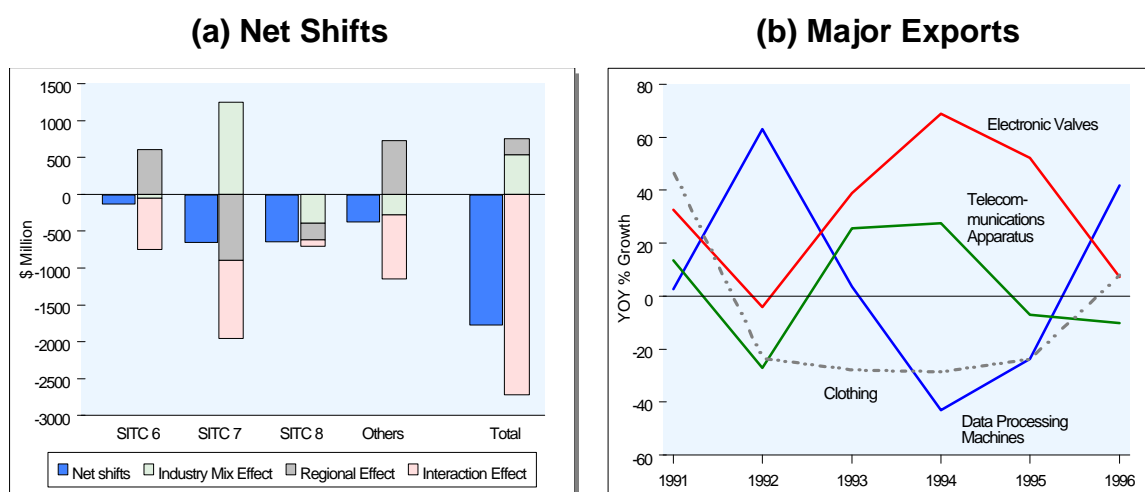


Germany

5.12 Among the major industrial markets, Germany was one of the worst performers. Although Singapore's exports to Germany experienced a smaller overall negative net shift than to the US, it was the only market where Singapore had posted negative net shifts in all categories of exports at the 1-digit SITC level. (See Chart 5.7 a.) Indeed, the largest negative net shift was recorded for SITC 7 exports, which were the major category of exports with substantial positive net shifts in Singapore's other major export markets. This was due to the much slower growth of Singapore's electronics exports to Germany relative to all other markets (negative regional effect), and the greater concentration of such exports to Germany vis-à-vis all other

markets (negative interaction effect). Of the SITC 7 category of exports, data processing machines (SITC 752) and telecommunications & sound recording apparatus (SITC 76) posted the largest negative net shifts. The only export category which registered significant positive net shift was electronic valves (SITC 776). (See Chart 5.7 b.) In fact, Singapore's exports of electronic valves to Germany grew by a substantial 30% p.a. over 1991-96, compared with 8.5% for its SITC 7 exports and 4.9% p.a. for its total exports to Germany.

Chart 5.7
Singapore's Exports to Germany



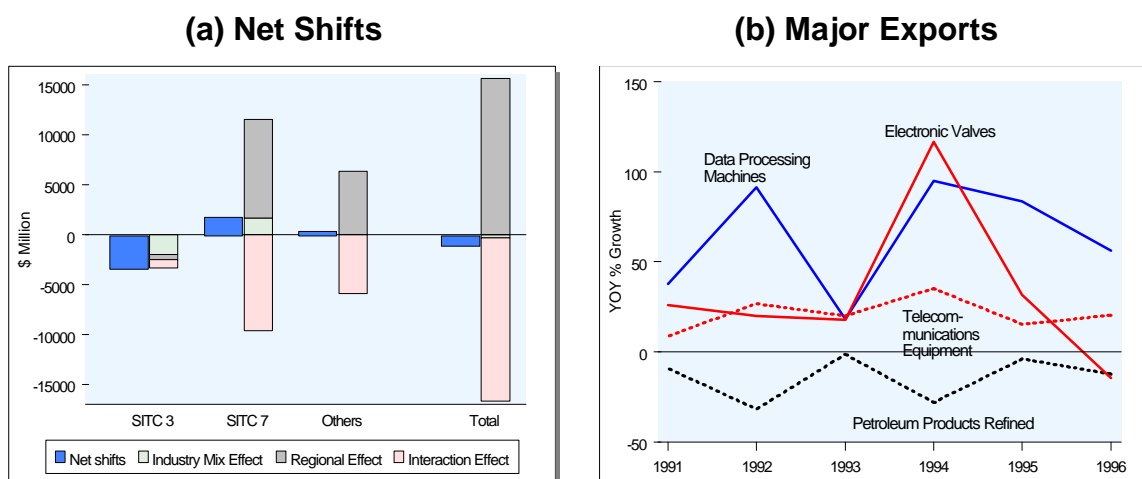
5.13 The other 1-digit SITC category of exports to Germany that registered a significant negative net shift was miscellaneous manufactured articles (SITC 8). In particular, exports of apparel and clothing accessories (SITC 84) not only posted a large negative net shift but also experienced a contraction, as in the US, with growth averaging negative 28% p.a. in 1991-1996. As a result, the share of SITC 8 in Singapore's total exports to Germany declined from 14.9% in 1991 to 7.2% in 1996.

Thailand

5.14 Growth of Singapore's export to Thailand was dragged down by the dismal performance of exports of mineral fuels, lubricants and related materials (SITC 3), particularly refined petroleum products (SITC 334). (See Chart 5.8 a.) The large negative net shift recorded in SITC 3 exports, with

the industry mix effect, regional effect and interaction effect being all negative, reflected Singapore's over-dependence on exports of SITC 334 to Thailand, whose growth had contracted by a considerable 16% p.a. over 1991-96. (See Chart 5.8 b.) Over the same period, the share of SITC 334 in Singapore's total exports to Thailand shrank from a high 40% to 10%. As noted earlier, the trend decline in Singapore's exports of refined petroleum products to Thailand reflected the latter's intensive effort to boost its own petroleum refining capacity over the last few years.

Chart 5.8
Singapore's Exports to Thailand

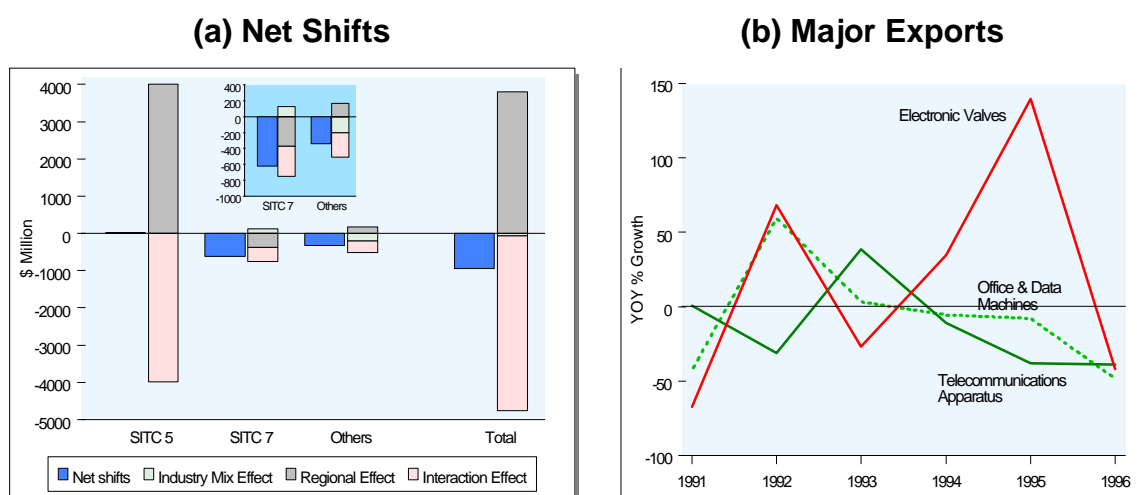


5.15 Singapore's exports of machinery and transport equipment (SITC 7) to Thailand, on the other hand, experienced a favourable net shift on account of its large positive regional effect. However, due to the smaller base of Singapore's SITC 7 exports to Thailand relative to the rest of the world in 1991, there was also a significant negative interaction effect. Singapore's exports of data processing machines (SITC 752), electronic valves (SITC 776) and telecommunications equipment (SITC 764) to Thailand, in particular, performed well. These trends suggest that Thailand has increasingly become an important production base for electronics products, with significant intra-industry trade linkages with Singapore.

Italy

5.16 Besides experiencing a large negative net shift (-\$0.9 bn), Singapore's total exports to Italy fell in absolute terms, by 5.8% p.a. over 1991-96. (See Chart 5.9 a.) This was attributed to the poor performance of electronics exports, which accounted for 64% of the total negative net shift. In particular, Singapore's exports of office and automatic data processing machines (SITC 75) and telecommunications & sound recording equipment (SITC 76) fell by 6% and 20% p.a. over 1991-1996 respectively, and recorded a combined negative net shift of \$0.6 bn. A decomposition of the negative net shifts revealed that all sectors of electronics recorded adverse regional effects, reflecting the slower growth of electronics exports to Italy than other markets.

Chart 5.9
Singapore's Exports to Italy

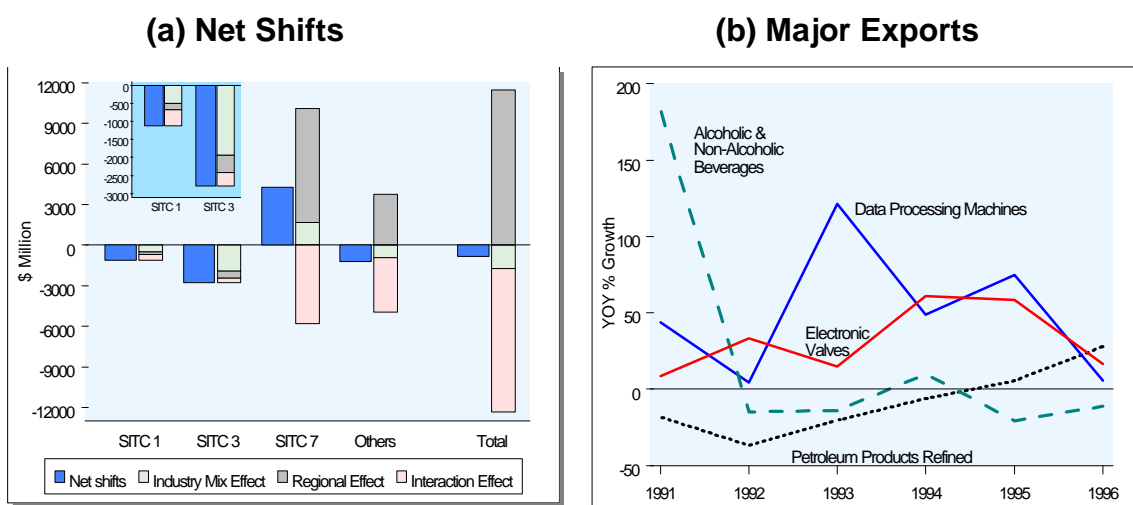


5.17 As in the case of Germany, the only category of electronics exports which registered a positive net shift in Italy was electronics valves, which grew strongly by 18% p.a. in 1991-96, albeit lower than the 29% p.a. growth of Singapore's total electronics valves exports to the world. (See Chart 5.9 b.) In 1996, electronics valves accounted for 30% of Singapore's total electronics exports to Italy, up from 9% in 1991.

Japan

5.18 From 8.7% in 1991, Japan's share of Singapore's total exports declined slightly to 8.2% in 1996, relegating it from the 3rd to the 4th position as Singapore's largest export market. The overall negative net shift in Singapore's exports to Japan reflected the poor export performance in refined petroleum products (SITC 334) and beverages and tobacco manufactures (SITC 1). (See Chart 5.10 a.) As for Thailand, Singapore's exports of refined petroleum products to Japan saw large absolute decline over 1991-96. Given its significant concentration in Singapore's total exports to Japan at 29% in 1991, it experienced negative industry mix, regional and interaction effects. Likewise, Singapore's exports of beverages and tobacco products declined by 22% p.a. in 1991-96 (see Chart 5.10 b), and recorded negative industry mix, regional and interaction effects, although much of its decline was due to re-exports rather than domestic exports.

Chart 5.10
Singapore's Exports to Japan



5.19 Nonetheless, Singapore's SITC 7 exports to Japan performed well, with a substantial positive net shift that offset the combined negative net shifts of its SITC 1 and 3 exports. In fact, growth of Singapore's SITC 7 exports to Japan was one of the highest among the industrial markets. In particular, exports of data processing machines (SITC 752) to Japan grew by a robust 45% p.a., much higher than to the US (17% p.a.), Germany (0.8%

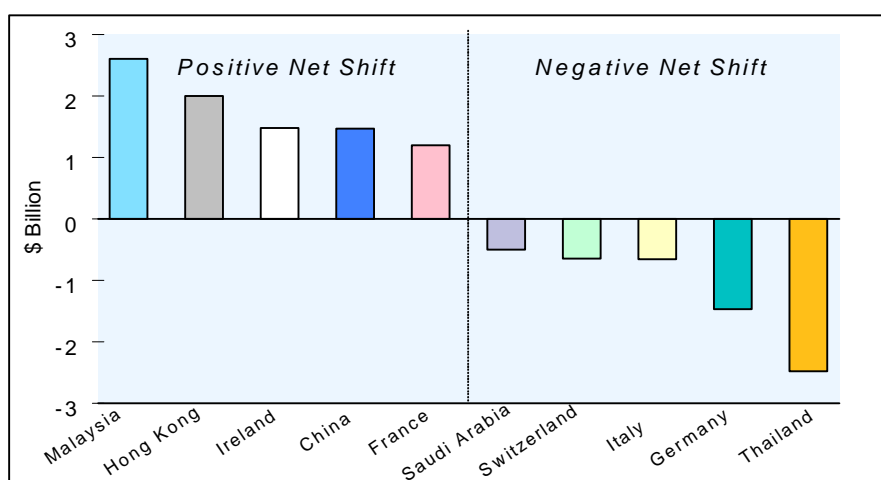
p.a.) and even Malaysia (37% p.a.). Electronics valves also saw stronger export growth in Japan, at 35% p.a., compared to 22% and 30% p.a. in the US and Germany respectively. (See Chart 5.10 b.) Reflecting the competitiveness of its electronics exports, Singapore's share of the Japanese electronics market increased from 8% in 1991 to 10% in 1996.

6 TRENDS IN SINGAPORE'S DOMESTIC EXPORT MARKET GROWTH

6.1 To the extent that an economy's capability to generate exports from its own industrial base is better reflected by its domestic exports than re-exports, it is useful to supplement our analysis of total exports with a separate analysis of domestic exports only. By applying the same shift-share technique to domestic exports, we found that the results of the analysis were similar to our earlier findings on total exports. (See Appendix 3.) There are, however, some significant differences.

6.2 First, while Malaysia and Hong Kong remained Singapore's top two markets for domestic export in terms of positive net shifts, Ireland is now elevated to the 3rd position, replacing China. (See Chart 6.1.) This largely reflects the higher level of re-exports to China, compared with that to Ireland. But more importantly, it underscores the emergence of Ireland as a significant trading partner of Singapore. Notwithstanding its small share in Singapore's total domestic exports, which in 1996 stood at 1.8%, there had been a six-fold increase in Singapore's domestic exports to Ireland since 1991 – the most rapid growth seen in any export market.

Chart 6.1
Top Five Positive and Negative Net Shifts Markets for Domestic Exports



6.3 Second, instead of the US, Thailand recorded the largest negative net shift for Singapore's domestic exports. This reflected the weaker performance of Singapore's domestic exports to Thailand compared to re-exports. The latter grew by 23.3% p.a. in 1991-96, significantly higher than the 0.3% p.a. recorded by Singapore's domestic exports to Thailand.

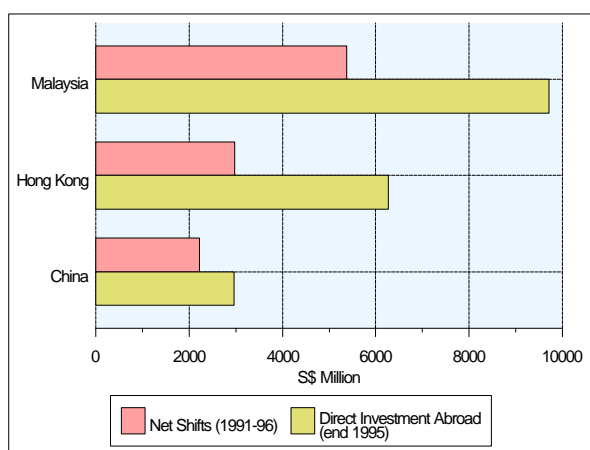
6.4 Third, unlike our earlier analysis, Singapore's domestic exports to Japan experienced a favourable net shift. The different outcomes reflected the weaker performance of Singapore's re-exports to Japan relative to its domestic exports. Thus, while domestic exports to Japan grew by about the same rate as Singapore's overall domestic exports of 10% p.a. in 1991-96, the 10% p.a. growth of re-exports to the Japanese market was slower than the 16% p.a. growth for Singapore's overall re-exports. The differential in growth was significant, given that re-exports accounted for about a third of Singapore's total exports to Japan.

7 SINGAPORE'S OVERSEAS INVESTMENT AND EXPORTS

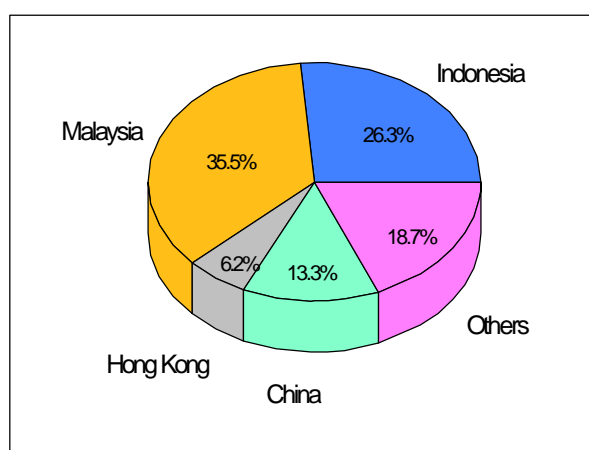
7.1 In this section, we examine the linkages between investment and trade. Since 1990, Singapore's outward direct investments in the region have grown at 21% p.a.. This is in line with the government's regionalisation effort aimed at creating an external wing for the Singapore economy to boost its foreign-sourced income. It is also consistent with the trend towards a transnational network of production facilities in the region to take advantage of the respective countries' comparative advantages. In this regard, it is interesting to note that the regional countries in which Singapore's exports recorded significant positive net shifts were also major recipients of its overseas investments. Three of Singapore's export markets with the largest positive net shifts, namely Malaysia, Hong Kong and China, were among the most popular destinations for Singapore's direct investments abroad. (See Chart 7.1 a.) Together, they accounted for half of Singapore's total overseas investment in 1995, with investments in Malaysia being the largest (\$ 9.7 bn), followed by Hong Kong (\$6.3 bn) and China (\$3.0 bn). The strong link between the direction of Singapore's exports and its overseas investments is even more apparent from the geographical pattern of *manufacturing* investments abroad. (See Chart 7.1 b.)

Chart 7.1

(a) Singapore's Export Growth & Direct Investment Abroad



(b) Singapore's Manufacturing Investment Abroad, 1995



8 IMPLICATIONS AND CONCLUSION

8.1 This paper has employed the shift-share technique to examine Singapore's export market growth in 1991-96. The results show that the regional economies have played an increasingly significant role vis-à-vis the industrial countries as Singapore's export markets. Exports to Malaysia, Hong Kong, China, Ireland and France posted the largest positive net shifts while exports to the US, Thailand, Germany, Italy and Japan recorded the largest negative net shifts. A decomposition of the net shifts shed further light on the factors that had contributed to the changes in share for all major export categories in each market. A number of significant implications for the Singapore economy can be drawn from the analyses.

8.2 First, the government's decision to focus on the promotion of electronics industries is well justified by the fact that export growth of Singapore in recent years was largely driven by the impressive performance of electronics exports. Despite the global electronics slowdown in 1992 and more recently in the second half of 1996, Singapore's exports of transport and machinery equipment (SITC 7) recorded the highest industry-mix effect in all its major export markets. While many have argued that Singapore's heavy dependence on the electronics industry has increased the economy's vulnerability to swings in the electronics cycle, it is almost certain that Singapore would not have achieved such high export growth if not for electronics exports. To be sure, the export performance of the various electronics sub-industries has been mixed. For example, exports of office and data processing machines (SITC 752) and electronic valves (SITC 776) grew more rapidly than that of telecommunications equipment (SITC 764) and consumer electronics like video recorders (SITC 763) and television receivers (SITC 761). The key to sustaining robust export expansion will be continued emphasis on fast growth sectors such as high-end disk drives and semiconductors.⁸ Moreover, with increasing focus on the electronics

⁸ Dataquest has forecast the semiconductor industry to register double-digit growth from 1998-2001, when the market is expected to surpass US\$300 bn.

industry by the regional economies, Singapore could hardly afford not to attract more high-tech investments to sharpen its competitive edge.

8.3 Second, while electronics would remain the mainstay of Singapore's export engine, industries such as chemicals and related products (SITC 5), and mineral fuels, lubricants and related materials (SITC 3), and miscellaneous manufactured articles (SITC 8) should not be overlooked. As these products accounted for a significant 23% of our total exports in 1996, higher growth could be obtained if greater efforts were made to expand their share in selected markets where Singapore has a competitive advantage. The need to focus on specific products for each export market where Singapore enjoys a competitive advantage is critical in the face of increasing competition from other exporters as well as domestic producers.

8.4 Third, while Singapore faces increasing competition from the region in its exports to the developed markets, it has also benefited greatly from exporting to the regional economies. This is reflected in the significant positive net shifts of Singapore's exports in most Asian NIEs. While the current regional currency crisis may affect the short-term growth prospects of some regional economies, the long-term outlook for the region remains favourable. Sustained growth and development in the region will continue to underpin Singapore's export growth. However, given that much of our exports to the region were intermediate goods to be assembled into final products for exports to third countries, the demand for our exports depends more on the strength of the industrial economies. The regional slowdown is thus unlikely to have significant adverse impact on our export growth provided demand from the industrial economies remains strong. Nevertheless, the uncertainty surrounding the region has underscored the need for Singapore to diversify its export base by reaching out to new growth areas outside the region.

8.5 Fourth, the diminishing importance of the US, Japan and the EU as Singapore's export markets, as implied by their negative net shifts,

has heightened the need for us to explore new export markets. Singapore has made some headway in penetrating into non-traditional markets, such as Ireland, where significant positive net shifts were experienced. However, our trading relations with a number of countries in the Middle East, Latin America, Eastern Europe, Russia and South Africa remain superficial. Trading opportunities in new markets in these areas should be identified and exploited to further boost Singapore's export performance. In this regard, the strategy of TDB's Committee on International Trade, as announced in Feb 1997, to focus more on emerging markets with the goal of turning Singapore into a city of international trade with global reach is appropriate.⁹ Furthermore, given that emerging markets are among areas that have the lowest penetration ratios for electronics products, the potential for growth of our electronics exports is high.

8.6 Finally, the regionalisation of the Singapore economy, with the attendant relocation of industries to countries in the region, has not led to a hollowing-out of Singapore's manufacturing sector or adverse ramifications on its export market growth. In fact, Singapore's exports are increasingly directed at markets where Singapore has heavily invested. In this regard, Singapore's regionalisation effort has been beneficial and initiatives such as the Singapore-Johor-Riau Growth Triangle, which exploit the different comparative advantages of the regional economies, should be promoted in order to attract investments of higher quality into Singapore.

⁹ TDB's recent strategic initiative to open an office in Dubai should be commended. Dubai is not only the focal point for countries bordering the Arabian Sea and Persian Gulf, it has grown to serve the newly-independent Central Asian republics, East Africa and the Indian subcontinent.

Appendix 1: Decomposition of Net Shift in Export Market

This appendix provides a mathematical exposition of the shift-share technique in analysing export market growth. Consider a country's export of commodity i to market j at time t , X_t^{ij} . We can express the change in exports as:

$$\begin{aligned}
 X_t^{ij} - X_{t-1}^{ij} = & \\
 & X_{t-1}^{ij} \cdot \left(\frac{X_t}{X_{t-1}} - 1 \right) \\
 & + X_{t-1}^{ij} \cdot \left\{ \left(\frac{X_t^i}{X_{t-1}^i} \right) - \left(\frac{X_t}{X_{t-1}} \right) \right\} \\
 & + X_{t-1}^j \cdot \frac{X_{t-1}^i}{X_{t-1}} \cdot \left\{ \left(\frac{X_t^{ij}}{X_{t-1}^{ij}} \right) - \left(\frac{X_t^i}{X_{t-1}^i} \right) \right\} \\
 & + \left\{ X_{t-1}^{ij} - X_{t-1}^j \cdot \frac{X_{t-1}^i}{X_{t-1}} \right\} \cdot \left\{ \left(\frac{X_t^{ij}}{X_{t-1}^{ij}} \right) - \left(\frac{X_t^i}{X_{t-1}^i} \right) \right\}
 \end{aligned}$$

Summing across all commodities, the growth or change in size of export market j , X_t^j , is given by:

$$\begin{aligned}
 X_t^j - X_{t-1}^j = & \\
 & \sum_i X_{t-1}^{ij} \cdot \left(\frac{X_t}{X_{t-1}} - 1 \right) && \Rightarrow \text{Overall Growth or Share Effect} \\
 & + \sum_i X_{t-1}^{ij} \cdot \left\{ \left(\frac{X_t^i}{X_{t-1}^i} \right) - \left(\frac{X_t}{X_{t-1}} \right) \right\} && \Rightarrow \text{Industry Mix Effect} \\
 & + \sum_i X_{t-1}^j \cdot \frac{X_{t-1}^i}{X_{t-1}} \cdot \left\{ \left(\frac{X_t^{ij}}{X_{t-1}^{ij}} \right) - \left(\frac{X_t^i}{X_{t-1}^i} \right) \right\} && \Rightarrow \text{Regional Effect} \\
 & + \sum_i \left\{ X_{t-1}^{ij} - X_{t-1}^j \cdot \frac{X_{t-1}^i}{X_{t-1}} \right\} \cdot \left\{ \left(\frac{X_t^{ij}}{X_{t-1}^{ij}} \right) - \left(\frac{X_t^i}{X_{t-1}^i} \right) \right\} && \Rightarrow \text{Interaction Effect}
 \end{aligned}$$

where

$$X_t^i = \sum_j X_t^{ij} \quad = \text{Exports of commodity } i \text{ to all markets;}$$

$$X_t^j = \sum_i X_t^{ij} \quad = \text{Exports of all commodities to market } j;$$

$$X_t = \sum_i \sum_j X_t^{ij} \quad = \text{Total exports}$$

Appendix 2: Singapore's Total Exports Growth, 1991-96

Country	1991	1996	Change	Share Effect	Net Shifts	% share	
						1991	1996
Malaysia	15,236,053	31,742,891	16,506,838	11,125,365	5,381,473	14.95	18.01
Hong Kong	7,346,485	15,687,401	8,340,916	5,364,403	2,976,513	7.21	8.90
China People's Republic	1,484,678	4,783,948	3,299,270	1,084,112	2,215,158	1.46	2.71
Ireland	275,216	2,017,527	1,742,311	200,963	1,541,348	0.27	1.14
France	1,190,070	3,466,986	2,276,916	868,989	1,407,927	1.17	1.97
Philippines	1,175,847	3,237,505	2,061,658	858,603	1,203,055	1.15	1.84
Korea, Republic Of	2,407,856	5,352,873	2,945,017	1,758,216	1,186,801	2.36	3.04
Other Countries in Asia	1,346,570	3,239,484	1,892,914	983,265	909,649	1.32	1.84
Brunei Darussalam	955,995	2,411,528	1,455,533	698,067	757,466	0.94	1.37
Taiwan	3,621,037	6,869,884	3,248,847	2,644,081	604,766	3.55	3.90
CIS	540,148	1,315,002	774,854	394,416	380,438	0.53	0.75
Brazil	190,902	687,615	496,713	139,397	357,316	0.19	0.39
Mexico	157,115	547,620	390,505	114,725	275,780	0.15	0.31
Myanmar	462,859	1,017,933	555,074	337,980	217,094	0.45	0.58
Malta	76,858	301,010	224,152	56,122	168,030	0.08	0.17
Finland	103,769	289,903	186,134	75,772	110,362	0.10	0.16
Macau	9,712	112,801	103,089	7,092	95,997	0.01	0.06
Argentina	105,231	217,686	112,455	76,840	35,615	0.10	0.12
Paraguay	8,064	41,798	33,734	5,888	27,846	0.01	0.02
Czech Republic	0	27,366	27,366	0	27,366	0.00	0.02
Israel	171,707	324,084	152,377	125,380	26,997	0.17	0.18
Puerto Rico	32,529	72,737	40,208	23,753	16,455	0.03	0.04
Madagascar	15,605	41,282	25,677	11,395	14,282	0.02	0.02
Other Countries in America	47,165	91,585	44,420	34,440	9,980	0.05	0.05
Ethiopia	2,026	10,991	8,965	1,479	7,486	0.00	0.01
Gabon	5,165	16,250	11,085	3,771	7,314	0.01	0.01
Uruguay	19,331	39,057	19,726	14,115	5,611	0.02	0.02
Portugal	74,811	133,010	58,199	54,627	3,572	0.07	0.08
Algeria	14,098	26,941	12,843	10,294	2,549	0.01	0.02
Guatemala	2,303	5,589	3,286	1,682	1,604	0.00	0.00
Slovak Republic (Slovakia)	0	1,484	1,484	0	1,484	0.00	0.00
Somali Democratic Republic	19	121	102	14	88	0.00	0.00
Iraq	0	6	6	0	6	0.00	0.00
Cameroon	5,998	8,110	2,112	4,380	-2,268	0.01	0.00
Zambia	2,881	2,697	-184	2,104	-2,288	0.00	0.00
Uganda	5,617	7,066	1,449	4,102	-2,653	0.01	0.00
Botswana	1,897	313	-1,584	1,385	-2,969	0.00	0.00
Ghana	16,647	24,739	8,092	12,156	-4,064	0.02	0.01
Cote D'Ivoire	8,951	11,324	2,373	6,536	-4,163	0.01	0.01
Netherlands Antilles	7,439	8,476	1,037	5,432	-4,395	0.01	0.00
Gibraltar	3,609	1,204	-2,405	2,635	-5,040	0.00	0.00
Morocco	31,309	48,884	17,575	22,862	-5,287	0.03	0.03
St Vincent and the Grenadines	20,461	29,851	9,390	14,941	-5,551	0.02	0.02
Comoros	8,087	6,702	-1,385	5,905	-7,290	0.01	0.00
Ecuador	7,244	4,828	-2,416	5,290	-7,706	0.01	0.00
Jamaica	8,560	5,978	-2,582	6,251	-8,833	0.01	0.00
Peru	18,845	22,179	3,334	13,761	-10,427	0.02	0.01
Luxembourg	18,795	21,652	2,857	13,724	-10,867	0.02	0.01
Trinidad and Tobago	7,976	2,557	-5,419	5,824	-11,243	0.01	0.00
Nauru	8,885	2,863	-6,022	6,488	-12,510	0.01	0.00
Honduras	24,479	27,595	3,116	17,875	-14,759	0.02	0.02
Bermuda	14,139	9,409	-4,730	10,324	-15,054	0.01	0.01
Tunisia	22,580	22,235	-345	16,488	-16,833	0.02	0.01
Djibouti	20,705	17,995	-2,710	15,119	-17,829	0.02	0.01
Korea, DPR	64,409	93,586	29,177	47,031	-17,854	0.06	0.05
New Caledonia	63,479	87,603	24,124	46,352	-22,228	0.06	0.05
New Zealand	326,371	541,729	215,358	238,316	-22,958	0.32	0.31
Seychelles	44,235	50,628	6,393	32,300	-25,907	0.04	0.03
Colombia	27,619	21,634	-5,985	20,167	-26,152	0.03	0.01
Solomon Islands	27,795	18,463	-9,332	20,296	-29,628	0.03	0.01
Hungary	67,789	87,547	19,758	49,500	-29,742	0.07	0.05
Qatar	41,450	41,964	514	30,267	-29,753	0.04	0.02
French Polynesia	38,187	32,923	-5,264	27,884	-33,148	0.04	0.02
Other Countries in Europe	29,925	17,983	-11,942	21,851	-33,793	0.03	0.01
Tanzania	44,759	39,897	-4,862	32,683	-37,545	0.04	0.02

Appendix 2: Singapore's Total Exports Growth, 1991-96 (cont'd)

Country	1991	1996	Change	Share Effect	Net Shifts	% share	
						1991	1996
Mozambique	28,831	11,001	-17,830	21,052	-38,882	0.03	0.01
Egypt	124,547	176,407	51,860	90,944	-39,084	0.12	0.10
Czechoslovakia	25,408	0	-25,408	18,553	-43,961	0.02	0.00
Romania	38,677	21,867	-16,810	28,242	-45,052	0.04	0.01
Sudan	36,813	18,567	-18,246	26,881	-45,127	0.04	0.01
Kuwait	86,963	101,715	14,752	63,500	-48,748	0.09	0.06
Yemen Democratic	31,951	6,317	-25,634	23,331	-48,965	0.03	0.00
Yemen	36,806	13,172	-23,634	26,876	-50,510	0.04	0.01
Syrian Arab Republic	40,404	19,179	-21,225	29,503	-50,728	0.04	0.01
Venezuela	38,829	15,017	-23,812	28,353	-52,165	0.04	0.01
Libyan Arab Jamahiriya	41,264	17,069	-24,195	30,131	-54,326	0.04	0.01
Bulgaria	40,715	14,616	-26,099	29,730	-55,829	0.04	0.01
Nepal	94,410	107,428	13,018	68,938	-55,920	0.09	0.06
Bahrain	57,096	39,844	-17,252	41,691	-58,943	0.06	0.02
Other Countries in Oceania	97,380	107,766	10,386	71,107	-60,721	0.10	0.06
India	1,727,209	2,927,029	1,199,820	1,261,208	-61,388	1.70	1.66
Reunion	58,535	32,076	-26,459	42,742	-69,201	0.06	0.02
Fiji	85,059	74,829	-10,230	62,110	-72,340	0.08	0.04
Lebanon	77,086	60,072	-17,014	56,288	-73,302	0.08	0.03
Mauritius	142,804	135,881	-6,923	104,275	-111,198	0.14	0.08
Chile	130,903	107,704	-23,199	95,585	-118,784	0.13	0.06
Cyprus	177,637	187,476	9,839	129,711	-119,872	0.17	0.11
Bahamas	141,391	105,457	-35,934	103,244	-139,178	0.14	0.06
Bangladesh	627,238	944,470	317,232	458,009	-140,777	0.62	0.54
Sri Lanka	398,527	546,106	147,579	291,004	-143,425	0.39	0.31
Afghanistan	95,804	21,251	-74,553	69,956	-144,509	0.09	0.01
Yugoslavia	97,259	17,545	-79,714	71,019	-150,733	0.10	0.01
Jordan	99,943	19,848	-80,095	72,978	-153,073	0.10	0.01
Maldives, Republic Of	169,571	137,645	-31,926	123,821	-155,747	0.17	0.08
Kenya	122,303	44,936	-77,367	89,306	-166,673	0.12	0.03
Turkey	240,907	240,212	-695	175,910	-176,605	0.24	0.14
Denmark	237,323	206,589	-30,734	173,293	-204,027	0.23	0.12
Austria	234,274	190,296	-43,978	171,067	-215,045	0.23	0.11
Papua New Guinea	250,963	218,915	-32,048	183,253	-215,301	0.25	0.12
Greece	279,267	240,976	-38,291	203,921	-242,212	0.27	0.14
Liberia	406,277	444,683	38,406	296,663	-258,257	0.40	0.25
Other Countries in Africa	616,975	794,679	177,704	450,515	-272,811	0.61	0.45
Iran (Islamic Republic Of)	254,863	165,441	-89,422	186,101	-275,523	0.25	0.09
Poland	242,399	137,705	-104,694	177,000	-281,694	0.24	0.08
Norway	278,413	173,453	-104,960	203,297	-308,257	0.27	0.10
Oman	222,717	66,274	-156,443	162,628	-319,071	0.22	0.04
Australia	2,516,514	4,014,089	1,497,575	1,837,558	-339,983	2.47	2.28
Sweden	307,874	192,069	-115,805	224,810	-340,615	0.30	0.11
United Kingdom	3,081,841	4,983,741	1,901,900	2,250,360	-348,460	3.02	2.83
Panama	701,982	813,669	111,687	512,587	-400,900	0.69	0.46
Pakistan	452,215	380,051	-72,164	330,207	-402,371	0.44	0.22
Guam	396,712	277,038	-119,674	289,679	-409,353	0.39	0.16
Spain	513,263	448,177	-65,086	374,785	-439,871	0.50	0.25
Netherlands	2,620,136	4,073,166	1,453,030	1,913,223	-460,193	2.57	2.31
Belgium	618,664	562,079	-56,585	451,748	-508,333	0.61	0.32
Nigeria	377,183	144,209	-232,974	275,419	-508,393	0.37	0.08
United Arab Emirates	1,035,551	1,270,362	234,811	756,159	-521,348	1.02	0.72
Switzerland	772,453	564,384	-208,069	564,045	-772,114	0.76	0.32
Canada	780,057	565,367	-214,690	569,598	-784,288	0.77	0.32
Saudi Arabia	783,110	535,439	-247,671	571,827	-819,498	0.77	0.30
Japan	8,836,430	14,454,705	5,618,275	6,452,361	-834,086	8.67	8.20
Italy	963,183	715,984	-247,199	703,316	-950,515	0.95	0.41
Thailand	6,400,629	10,006,161	3,605,532	4,673,739	-1,068,207	6.28	5.68
Germany, Federal Republic Of	4,262,663	5,412,993	1,150,330	3,112,596	-1,962,266	4.18	3.07
United States	20,102,984	32,446,306	12,343,322	14,679,198	-2,335,876	19.73	18.41
TOTAL	101,879,520	176,271,940				100.0	100.0

Appendix 3: Singapore's Domestic Exports Growth, 1991-96

Country	1991	1996	Change	Share Effect	Net Shifts	% share	
						1991	1996
Malaysia	6,819,068	13,298,912	6,479,844	3,878,604	2,601,240	10.33	12.84
Hong Kong	4,803,261	9,538,180	4,734,919	2,732,037	2,002,882	7.27	9.21
Ireland	225,962	1,827,827	1,601,865	128,524	1,473,341	0.34	1.76
China People'S Republic	880,026	2,844,323	1,964,297	500,548	1,463,749	1.33	2.75
France	867,897	2,556,651	1,688,754	493,649	1,195,105	1.31	2.47
Korea, Republic Of	1,470,934	3,018,917	1,547,983	836,650	711,333	2.23	2.91
Other Countries in Asia	553,672	1,444,075	890,403	314,922	575,481	0.84	1.39
Philippines	668,114	1,524,873	856,759	380,015	476,744	1.01	1.47
Japan	6,034,737	9,789,140	3,754,403	3,432,486	321,917	9.14	9.45
Brazil	85,470	392,721	307,251	48,614	258,637	0.13	0.38
Taiwan	2,240,874	3,710,278	1,469,404	1,274,582	194,822	3.39	3.58
Mexico	93,862	338,463	244,601	53,388	191,213	0.14	0.33
Malta	59,790	282,713	222,923	34,008	188,915	0.09	0.27
Myanmar	99,519	344,611	245,092	56,605	188,487	0.15	0.33
Netherlands	1,921,144	3,168,260	1,247,116	1,092,724	154,392	2.91	3.06
Finland	81,319	149,401	68,082	46,253	21,829	0.12	0.14
Czech Republic	0	18,037	18,037	0	18,037	0.00	0.02
CIS	256,391	418,228	161,837	145,832	16,005	0.39	0.40
Macau	2,463	19,197	16,734	1,401	15,333	0.00	0.02
Puerto Rico	24,979	51,393	26,414	14,208	12,206	0.04	0.05
Argentina	53,596	96,240	42,644	30,485	12,159	0.08	0.09
Korea, Democratic People's Rep Of	10,086	26,083	15,997	5,737	10,260	0.02	0.03
Morocco	18,788	39,641	20,853	10,686	10,167	0.03	0.04
Uruguay	7,800	20,835	13,035	4,437	8,598	0.01	0.02
Uganda	449	3,976	3,527	255	3,272	0.00	0.00
Slovak Republic (Slovakia)	0	977	977	0	977	0.00	0.00
Netherlands Antilles	3,568	6,487	2,919	2,029	890	0.01	0.01
Colombia	4,028	7,103	3,075	2,291	784	0.01	0.01
Paraguay	5,809	9,712	3,903	3,304	599	0.01	0.01
Madagascar	5,133	8,113	2,980	2,920	60	0.01	0.01
Botswana	66	119	53	38	15	0.00	0.00
Iraq	0	0	0	0	0	0.00	0.00
Somali Democratic Republic	16	0	-16	9	-25	0.00	0.00
Zambia	706	981	275	402	-127	0.00	0.00
Jamaica	521	625	104	296	-192	0.00	0.00
Ethiopia	1,407	1,497	90	800	-710	0.00	0.00
Tunisia	6,856	9,716	2,860	3,900	-1,040	0.01	0.01
St Vincent and the Grenadines	18,965	28,585	9,620	10,787	-1,167	0.03	0.03
Ecuador	2,132	2,000	-132	1,213	-1,345	0.00	0.00
Nepal	23,090	34,817	11,727	13,133	-1,406	0.03	0.03
Guatemala	1,411	648	-763	803	-1,566	0.00	0.00
Peru	9,989	13,210	3,221	5,682	-2,461	0.02	0.01
Gabon	2,073	627	-1,446	1,179	-2,625	0.00	0.00
Comoros	2,948	1,209	-1,739	1,677	-3,416	0.00	0.00
Cote D'Ivoire	4,712	3,913	-799	2,680	-3,479	0.01	0.00
Gibraltar	2,580	137	-2,443	1,467	-3,910	0.00	0.00
Algeria	4,782	3,409	-1,373	2,720	-4,093	0.01	0.00
Cameroon	3,036	291	-2,745	1,727	-4,472	0.00	0.00
Trinidad and Tobago	3,806	624	-3,182	2,165	-5,347	0.01	0.00
Honduras	22,279	25,571	3,292	12,672	-9,380	0.03	0.02
New Caledonia	51,465	70,977	19,512	29,273	-9,761	0.08	0.07
Djibouti	12,897	10,238	-2,659	7,336	-9,995	0.02	0.01
Ghana	10,873	7,014	-3,859	6,184	-10,043	0.02	0.01
Other Countries in America	27,920	33,210	5,290	15,881	-10,591	0.04	0.03
Nauru	8,789	2,850	-5,939	4,999	-10,938	0.01	0.00
Bermuda	13,443	9,002	-4,441	7,646	-12,087	0.02	0.01
Hungary	45,687	59,543	13,856	25,986	-12,130	0.07	0.06
Luxembourg	17,218	14,260	-2,958	9,793	-12,751	0.03	0.01
Solomon Islands	12,417	6,126	-6,291	7,063	-13,354	0.02	0.01
Venezuela	12,093	3,955	-8,138	6,878	-15,016	0.02	0.00
Qatar	26,393	25,118	-1,275	15,012	-16,287	0.04	0.02
Bulgaria	15,921	8,314	-7,607	9,056	-16,663	0.02	0.01
Czechoslovakia	11,793	0	-11,793	6,708	-18,501	0.02	0.00

Appendix 3: Singapore's Domestic Exports Growth, 1991-96 (cont'd)

Country	1991	1996	Change	Share Effect	Net Shifts	% share	
						1991	1996
Romania	18,291	9,725	-8,566	10,404	-18,970	0.03	0.01
Chile	46,070	51,456	5,386	26,204	-20,818	0.07	0.05
Tanzania	28,493	22,250	-6,243	16,206	-22,449	0.04	0.02
Yemen	18,110	5,898	-12,212	10,301	-22,513	0.03	0.01
Libyan Arab Jamahiriya	21,016	9,794	-11,222	11,954	-23,176	0.03	0.01
Seychelles	28,326	20,079	-8,247	16,111	-24,358	0.04	0.02
Egypt	66,540	78,356	11,816	37,847	-26,031	0.10	0.08
French Polynesia	27,170	16,330	-10,840	15,454	-26,294	0.04	0.02
Bahamas	82,002	101,662	19,660	46,642	-26,982	0.12	0.10
Other Countries in Europe	23,798	10,107	-13,691	13,536	-27,227	0.04	0.01
Sri Lanka	155,116	213,891	58,775	88,228	-29,453	0.23	0.21
Mozambique	24,256	8,004	-16,252	13,797	-30,049	0.04	0.01
Other Countries in Oceania	76,977	90,085	13,108	43,784	-30,676	0.12	0.09
Reunion	22,147	3,992	-18,155	12,597	-30,752	0.03	0.00
Portugal	54,544	54,575	31	31,024	-30,993	0.08	0.05
Afghanistan	24,338	7,061	-17,277	13,843	-31,120	0.04	0.01
Yemen Democratic	22,709	3,053	-19,656	12,917	-32,573	0.03	0.00
Sudan	25,431	6,486	-18,945	14,465	-33,410	0.04	0.01
Syrian Arab Republic	26,733	8,265	-18,468	15,205	-33,673	0.04	0.01
Bahrain	33,871	17,377	-16,494	19,265	-35,759	0.05	0.02
Lebanon	43,079	29,671	-13,408	24,503	-37,911	0.07	0.03
Kuwait	60,273	56,317	-3,956	34,283	-38,239	0.09	0.05
New Zealand	195,029	266,166	71,137	110,930	-39,793	0.30	0.26
Israel	95,802	108,230	12,428	54,491	-42,063	0.15	0.10
Brunei Darussalam	275,412	387,878	112,466	156,651	-44,185	0.42	0.37
Other Countries in Africa	213,938	288,473	74,535	121,685	-47,150	0.32	0.28
Fiji	56,904	40,436	-16,468	32,366	-48,834	0.09	0.04
Bangladesh	401,784	576,009	174,225	228,530	-54,305	0.61	0.56
Mauritius	68,782	47,909	-20,873	39,122	-59,995	0.10	0.05
Papua New Guinea	101,803	89,988	-11,815	57,904	-69,719	0.15	0.09
Maldives, Republic Of	68,576	36,879	-31,697	39,005	-70,702	0.10	0.04
Yugoslavia	46,980	2,214	-44,766	26,722	-71,488	0.07	0.00
Cyprus	139,369	140,720	1,351	79,271	-77,920	0.21	0.14
United Kingdom	2,350,748	3,600,978	1,250,230	1,337,077	-86,847	3.56	3.48
Kenya	75,696	18,750	-56,946	43,055	-100,001	0.11	0.02
Jordan	70,873	10,484	-60,389	40,312	-100,701	0.11	0.01
Turkey	140,686	119,905	-20,781	80,021	-100,802	0.21	0.12
Denmark	166,923	155,463	-11,460	94,944	-106,404	0.25	0.15
Poland	119,104	79,044	-40,060	67,745	-107,805	0.18	0.08
Nigeria	89,655	27,440	-62,215	50,995	-113,210	0.14	0.03
United States	16,455,310	25,689,131	9,233,821	9,359,582	-125,761	24.92	24.80
Pakistan	182,274	158,153	-24,121	103,675	-127,796	0.28	0.15
Iran (Islamic Republic Of)	119,748	58,157	-61,591	68,111	-129,702	0.18	0.06
Austria	184,745	118,306	-66,439	105,081	-171,520	0.28	0.11
Norway	193,737	131,583	-62,154	110,195	-172,349	0.29	0.13
Oman	137,026	30,750	-106,276	77,939	-184,215	0.21	0.03
Greece	220,180	158,749	-61,431	125,236	-186,667	0.33	0.15
Panama	568,266	667,186	98,920	323,223	-224,303	0.86	0.64
Spain	313,249	259,488	-53,761	178,172	-231,933	0.47	0.25
Sweden	219,946	109,233	-110,713	125,103	-235,816	0.33	0.11
United Arab Emirates	421,129	416,202	-4,927	239,533	-244,460	0.64	0.40
Liberia	382,750	302,420	-80,330	217,704	-298,034	0.58	0.29
Belgium	385,717	277,579	-108,138	219,391	-327,529	0.58	0.27
Australia	1,648,857	2,258,230	609,373	937,850	-328,477	2.50	2.18
Guam	379,185	256,110	-123,075	215,676	-338,751	0.57	0.25
India	1,012,032	1,193,511	181,479	575,632	-394,153	1.53	1.15
Canada	528,781	356,846	-171,935	300,764	-472,699	0.80	0.34
Saudi Arabia	443,450	196,921	-246,529	252,229	-498,758	0.67	0.19
Switzerland	607,419	302,619	-304,800	345,493	-650,293	0.92	0.29
Italy	712,997	459,476	-253,521	405,544	-659,065	1.08	0.44
Germany, Federal Republic Of	3,141,688	3,456,058	314,370	1,786,954	-1,472,584	4.76	3.34
Thailand	4,488,209	4,560,813	72,604	2,552,839	-2,480,235	6.80	4.40
TOTAL	66,031,078	103,588,760				100.0	100.0

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