

FEATURE ARTICLE

UPDATE ON VALUE-ADDED FROM SINGAPORE'S EXPORTS

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EXECUTIVE SUMMARY

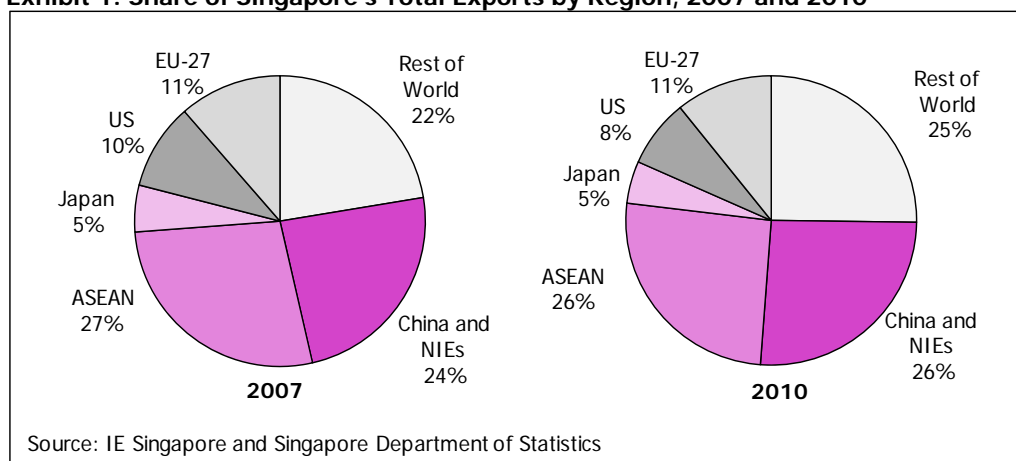
- This paper provides an update of the Value-Added (VA) from Singapore's merchandise and services exports to key markets, derived using the latest 2007 Input-Output tables.
- Several key improvements to earlier works on this topic have been made. In particular, we have made an attempt at estimating the VA from Singapore's re-exports (RX), disaggregated by destination.
- In 2010, the VA from Singapore's exports accounted for about two-thirds of GDP, of which a third was contributed by services exports. Our results also suggest that Singapore's trade ties with the North-East Asia region have become more important.

The views expressed in this paper are solely those of the authors and do not necessarily reflect those of the Ministry of Trade and Industry, International Enterprise Singapore, or the Government of Singapore.

INTRODUCTION

Singapore's exports grew from \$562 billion in 2007 to \$615 billion in 2010, a compound annual growth rate of 3.1 per cent. In 2010, the G3 economies' share of Singapore's exports was 23.1 per cent, a decline from the 26.2 per cent share in 2007.² In contrast, the combined share of exports going to China and the Asian newly-industrialised economies (NIEs) increased from 24.0 per cent in 2007 to 26.0 per cent in 2010, reflecting these economies' growing importance as sources of demand and key nodes of intra-regional production networks ([Exhibit 1](#)).³

Exhibit 1: Share of Singapore's Total Exports by Region, 2007 and 2010



¹ This paper updates and extends earlier works by Jayaram and Neo (2010) and Neo and Thia (2009). Among other methodological improvements, one key extension was to expand the coverage of earlier works, by considering, for the first time, the VA of Singapore's re-exports disaggregated by country of destination.

² G3 refers to the United States, Japan and the EU-27.

³ NIEs refer to Hong Kong, Chinese Taipei and South Korea.

However, the headline export shares alone may not accurately reflect the importance of these partner economies to Singapore's GDP. This is because the composition of the export basket varies significantly between economies, and different types of exports generate different VA impacts.

METHODOLOGY AND RESULTS

To compute the VA generated from Singapore's merchandise and services exports to key markets, this paper uses the latest 2007 Input-Output tables published by the Department of Statistics (refer to Annex for more details on the methodology).

Our results show that VA from exports accounted for 66.2 per cent of Singapore's GDP in 2007 ([Exhibit 2](#)). Of this, merchandise exports, which consist of domestic exports and re-exports, were the largest contributor of export VA for Singapore, with a 41.0 per cent share of GDP in 2007. Domestic exports accounted for 30.2 per cent of the VA, while 10.8 per cent came from re-exports. On the other hand, services exports and offshore trade made up 21.2 per cent and 4.0 per cent of GDP, respectively.

In 2010, VA contribution from exports declined slightly to 64.0 per cent of Singapore's GDP. This was mainly due to lower contribution of domestic exports to Singapore's GDP, from 30.2 per cent to 27.0 per cent. The lower contribution can be attributed to the shift in composition of domestic exports, as growth in domestic exports of petroleum products, which have lower VA per dollar, outstripped growth in non-oil domestic exports (NODX) from 2007 to 2010.

In contrast, VA contribution from services exports rose by 1.4 percentage points to 22.6 per cent of GDP in 2010, underscoring the growing importance of services exports to the Singapore economy. In particular, almost one-third of the increase was attributed to tourism activities, which accounted for 13.4 per cent of the VA from services exports in 2010, up from 9.9 per cent in 2007. Notably, the VA per dollar of services exports (51 cents) was 1.5 times as high as the VA per dollar of domestic exports (34 cents) and nearly 3 times the VA per dollar of re-exports (13 cents). This is due to the fact that manufacturing of goods in Singapore tends to use more imported products as intermediate inputs, compared to the production of services, and that re-exports, by definition, have a very high level of foreign input content.

Exhibit 2: VA Contribution from Exports as Proportion of Singapore's GDP, 2007 and 2010



DOMESTIC EXPORTS

The EU-27 was the largest contributor to Singapore's VA from domestic exports, with shares of 19.6 per cent and 16.7 per cent in 2007 and 2010 respectively ([Exhibit 3](#)). The decline in proportion over this period reflected the decrease in our domestic exports of electronics and pharmaceutical products to the region. Similarly, the US' shares of both domestic exports as well as VA from domestic exports also declined between 2007 and 2010, largely due to the decline in domestic exports of pharmaceuticals.

In contrast, the VA share from domestic exports to both Hong Kong and Chinese Taipei increased to 9.5 per cent and 4.8 per cent respectively in 2010, due to a surge in exports of electronics products. Likewise, the VA shares from domestic exports to China and South Korea in 2010 were higher, coming in at 9.5 per cent and 4.0 per cent respectively. This was mainly due to rising exports of petroleum and transport equipment. On the whole, these findings highlight the increasing importance of North-East Asia as a trading partner and contributor to Singapore's export VA.

In addition, VA per dollar of domestic exports also varied significantly by markets due to different product mix. In 2007, domestic exports to the EU-27 and the US generated the highest VA per dollar of exports, at 48 cents and 41 cents per dollar respectively. In 2010, the VA per dollar of domestic exports to the EU-27 and the US remained high, at 43 and 42 cents per dollar respectively, as pharmaceuticals accounted for a high share of domestic exports to these markets.

Exhibit 3: VA Share of Domestic Exports to Various markets, 2007 & 2010

	VA Share of Domestic Exports (%)		VA Per Dollar of Domestic Exports (\$)	
	2007	2010	2007	2010
EU-27	19.6	16.7	0.48	0.43
US	13.7	9.8	0.41	0.42
Hong Kong	7.3	9.5	0.27	0.31
China	8.1	9.5	0.33	0.33
Malaysia	9.0	8.8	0.31	0.29
Indonesia	6.4	6.1	0.30	0.31
Japan	5.5	5.4	0.36	0.38
Australia	3.3	3.2	0.25	0.26
India	2.4	2.8	0.32	0.30
South Korea	3.0	4.0	0.38	0.39
Thailand	4.0	3.6	0.35	0.38
Chinese Taipei	3.3	4.8	0.37	0.40
Vietnam	1.4	1.3	0.23	0.29
Mexico	0.6	0.6	0.38	0.44
Brazil	0.6	0.5	0.33	0.35
Rest of ASEAN	2.6	2.6	0.32	0.29
Rest of the World	9.3	10.9	0.28	0.26
Total	100.0	100.0	0.34	0.34

Source: Authors' calculations

RE-EXPORTS

Asian economies are amongst the largest contributors to Singapore's VA from re-exports, with China, Hong Kong and Indonesia having sizeable shares at over 10 per cent each ([Exhibit 4](#)). Indonesia used to be the largest contributor to Singapore's VA from re-exports, with a 17.2 per cent share in 2007. However, in 2010, Hong Kong took over the top position with a share of 18.3 per cent (from 11.1 per cent in 2007), as Indonesia's share declined to 11.4 per cent.

The decline in Indonesia's share of VA from re-exports was mainly due to a larger amount of low-VA products being re-exported to Indonesia in 2010. In particular, the proportion of petroleum products in re-exports to Indonesia grew from 16.3 per cent in 2007 to 29.6 per cent in 2010, while the share of re-exports of electronics products, which have higher VA per dollar in comparison, declined from 26.7 per cent in 2007 to 17.7 per cent in 2010.

On the other hand, Hong Kong's share of VA from re-exports increased from 11.1 per cent in 2007 to 18.3 per cent in 2010, due to an increase in the share of electronics products in re-exports to Hong Kong.

Compared to domestic and services exports, the VA per dollar of re-exports displayed less variation by markets, as the VA content of re-export activity is low by definition. The re-exporting process comprises mostly lower-VA activities such as bulk breaking and repackaging, which explains the low VA per dollar of re-exports at 13 cents.

Exhibit 4: VA Share of Re-exports to Various Markets, 2007 & 2010

	VA Share of Re-exports (%)		VA Per Dollar of Re-exports (\$)	
	2007	2010	2007	2010
EU-27	6.9	7.0	0.13	0.14
US	5.1	5.8	0.12	0.15
Hong Kong	11.1	18.3	0.12	0.18
China	14.9	12.3	0.18	0.14
Malaysia	9.6	7.9	0.08	0.07
Indonesia	17.2	11.4	0.18	0.12
Japan	3.7	7.1	0.11	0.20
Australia	2.5	1.6	0.12	0.07
India	4.2	4.6	0.14	0.13
South Korea	4.5	4.2	0.13	0.11
Thailand	3.1	4.7	0.10	0.14
Chinese Taipei	2.7	3.3	0.12	0.13
Vietnam	2.1	1.6	0.12	0.08
Mexico	0.1	0.1	0.06	0.09
Brazil	0.4	0.2	0.20	0.10
Rest of ASEAN	3.1	2.9	0.16	0.10
Rest of the World	8.7	7.1	0.16	0.12
Total	100.0	100.0	0.13	0.13

Source: Authors' calculations

SERVICES EXPORTS

The EU-27 was the largest contributor to Singapore's VA from services exports, growing from a 17.5 per cent share in 2007 to 17.7 per cent in 2010 ([Exhibit 5](#)). The increase in share of services exports reflected a rise in the export of transport services to the region. Similarly, the share of VA from services exports to Australia, China and India also saw an increase from 2007 to 2010.

The VA per dollar of services exports is particularly high for exports of services to Hong Kong, at 74 cents per dollar in 2010, up slightly from 72 cents per dollar in 2007. This was because the bulk of services exports to Hong Kong was composed of high-VA activities, such as financial services and business services. In contrast, VA per dollar of services exports to China was lower, at 53 cents per dollar in 2010, due to the large amount of exports of water transport services which have lower VA per dollar of exports. For Australia, VA per dollar of services exports rose from 47 cents per dollar in 2007 to 55 cents per dollar in 2010. This increase was due to higher exports of business headquarter activities in recent years, as compared to 2007 when services exports to Australia still consisted mainly of transport services.

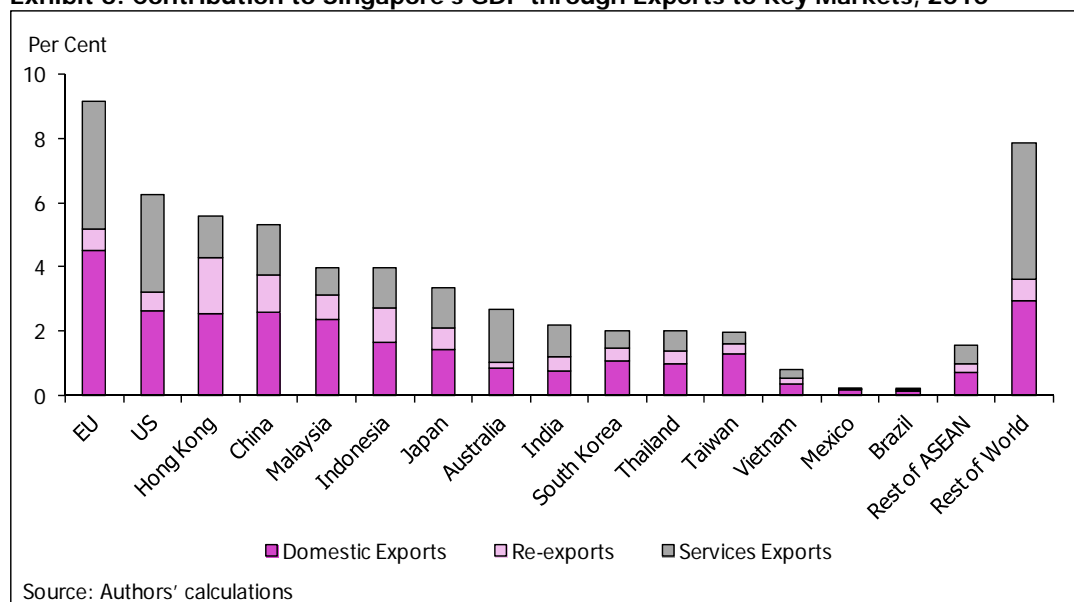
Exhibit 5: VA Share of Services Exports to Various Markets, 2007 & 2010

	VA Share of Services Exports (%)		VA Per Dollar of Services Exports (\$)	
	2007	2010	2007	2010
EU-27	17.5	17.7	0.59	0.59
US	14.6	13.5	0.56	0.58
Hong Kong	6.0	5.6	0.72	0.74
China	5.2	6.9	0.49	0.53
Malaysia	4.0	3.8	0.58	0.55
Indonesia	5.2	5.5	0.60	0.63
Japan	8.7	5.4	0.60	0.52
Australia	4.3	7.4	0.47	0.55
India	3.7	4.4	0.50	0.58
South Korea	2.7	2.3	0.51	0.55
Thailand	2.4	2.6	0.58	0.57
Chinese Taipei	2.0	1.6	0.50	0.40
Vietnam	0.9	1.3	0.53	0.62
Rest of ASEAN	2.5	2.6	0.60	0.59
Rest of the World	19.8	18.8	0.60	0.64
Total	100.0	100.0	0.51	0.51

Source: Authors' calculations

TOTAL EXPORTS

Overall, the EU-27 and the US still accounted for the largest shares of VA from exports at 15.0 per cent and 10.4 per cent respectively in 2010, despite the decrease in share from 2007. In terms of contribution to overall GDP, total exports to the EU-27 and the US also made up a substantial share, forming 9.2 per cent and 6.3 per cent respectively of Singapore's GDP in 2010 ([Exhibit 6](#)).

Exhibit 6: Contribution to Singapore's GDP through Exports to Key Markets, 2010

Source: Authors' calculations

CONCLUSION

Services exports, which have the highest VA per dollar of exports, are increasingly important to the Singapore economy. Indeed, the VA of services exports accounted for more than one-third of total VA from exports in 2010. This was in part due to efforts to develop the services sector as a twin engine of growth alongside the manufacturing sector, as well as the move towards services exports with higher VA. While the VA contribution from merchandise exports, notably domestic exports, declined between 2007 and 2010, it remained the key contributor towards Singapore's GDP given the retention of high-VA manufacturing activities in the economy.

While the G3 economies still accounted for most of the VA from Singapore's exports in 2010, an increasing share of the VA was derived from exports to China and other Northeast Asian economies. In addition, tourism exports to ASEAN countries have also grown in importance. Amidst the external headwinds from the advanced economies, growing intra-regional trade to tap on opportunities in rising Asia could help to provide support to Singapore's medium-term economic growth.

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ANNEX: METHODOLOGY

We used a standard Input-Output (IO) open multiplier model to calculate the VA from exports to key markets based on the latest available (2007) IO tables.⁴

Exports to each market are compiled mainly from merchandise exports data from International Enterprise Singapore (IE Singapore) and services exports data from DOS and Singapore Tourism Board (STB). These exports are mapped to the 136 sectors of the IO tables. The VA multiplier for each sector, as given by the IO tables, is then multiplied to these exports, to obtain the VA generated from exports to each market. For more information on the definition and interpretation of multipliers from the IO tables, please refer to DOS' publication on the IO tables.⁵

Following international guidelines on wholesale trading activity, the economic output for companies engaging in re-export activity is given by the margins of re-export or the sale of goods less the cost of goods sold, and not the full value of the goods exported. These margins are computed based on import and re-export values in IE Singapore's trade database and allocated to the different markets based on the markets' shares of re-exports at detailed firm level. The margins are then mapped into the IO tables, particularly the wholesale trade sector.

This paper has updated and extended previous studies, namely in these key areas:

- a. Definition of services exports: In 2009, the IMF updated the international standards for compilation of balance of payments to the Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6). The update contains, inter alia, revisions to the coverage of trade in services. In 2012, DOS completed the first phase of implementing BPM6 recommendations in Singapore's statistics on trade in services, and revised historical data on Singapore's exports of services to match the revised coverage.
- b. Estimating VA of re-exports across countries: This paper makes a first attempt to come up with an allocation of VA from re-exports across countries, using firm-level data. The re-exports at firm level are matched against imports, allowing an estimate of the margins earned from re-export activity.
- c. Improvement in the treatment of tourists' shopping expenditure data: Unlike previous papers allocated shopping expenditure of tourists to only the wholesale and retail trade sectors, such expenditure is now mapped to a wider range of appropriate IO sectors, including not just the retail sector but also manufacturing sectors such as computers & computer peripheral equipment. This will derive a more accurate measure of VA from tourists' shopping expenditure.

⁴ For more details on the open multiplier model, please refer to Low and Toh (1984).

⁵ Singapore Input-Output Tables, 2007, Department of Statistics, March 2012.