

# SINGAPORE SUPPLY AND USE, AND INPUT-OUTPUT TABLES 2010: AN OVERVIEW

## 1. INTRODUCTION

1.1 The supply and use tables (SUTs) provide a comprehensive and integrated framework for the reconciliation of key national accounts aggregates. The SUTs also describe the inter-relationship between producers and consumers of goods and services, and inter-dependence among the different industries. The input-output tables (IOTs) are derived from the SUTs and are used for a variety of analytical purposes such as economic modelling and impact studies.

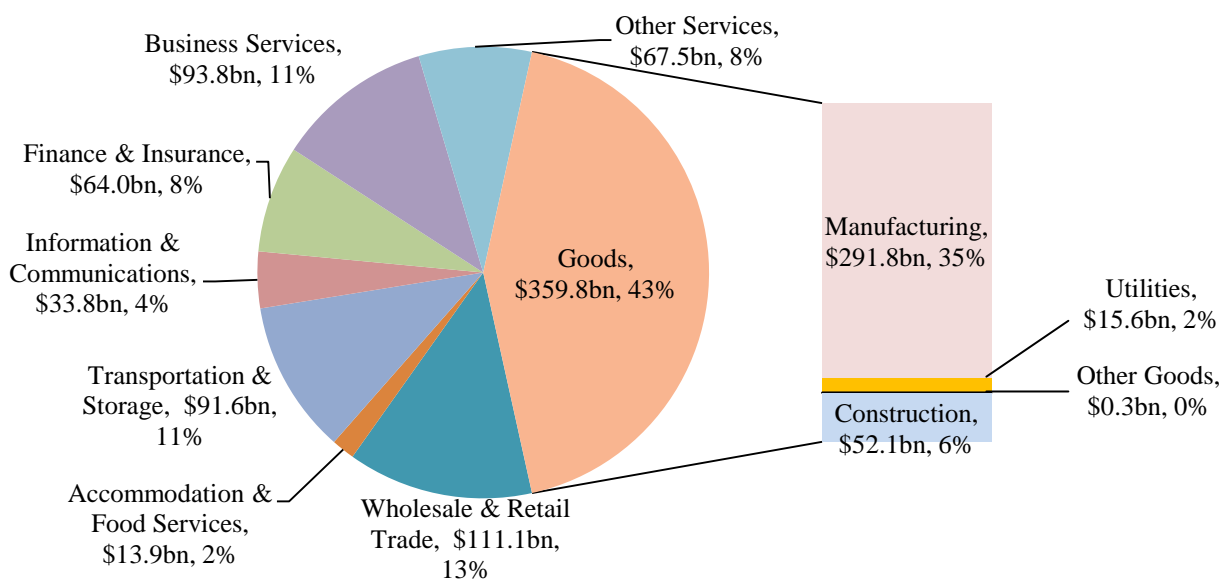
1.2 This summary report provides an overview of the 2010 SUTs and key results from the applications of the 2010 IOTs.<sup>1</sup>

## 2. SUPPLY AND USE TABLES

2.1 The domestic supply table and domestic use table are the two main tables in the SUTs. The domestic supply table records all domestic production, broken down by industries and products. The domestic use table records the domestically produced products purchased or used for intermediate consumption and final demand. The 2010 SUTs were used to reconcile the three GDP estimates in the recently completed rebasing of Singapore’s national accounts to reference year 2010.

2.2 In 2010, the Singapore economy produced \$835.5 billion worth of goods and services. The services sector accounted for 57 per cent of total domestic output while the goods sector accounted for the remaining 43 per cent. These details are obtained from the domestic supply table, which is summarised in Exhibit 1.

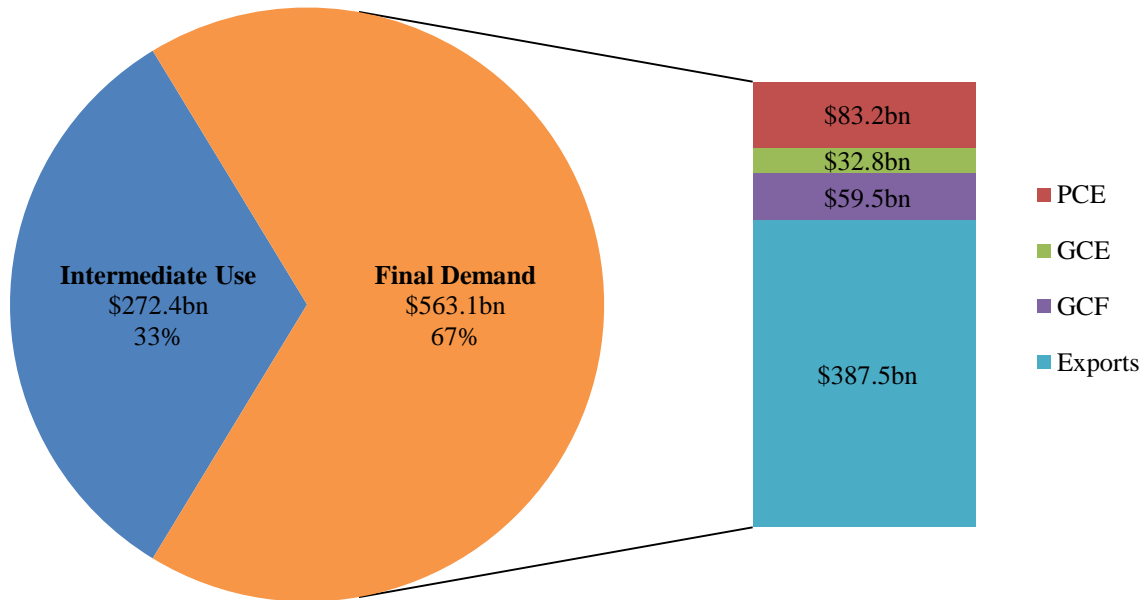
Exhibit 1 : Industry Output at Basic Prices, 2010



<sup>1</sup> Please refer to the publication [Singapore Supply and Use, and Input-Output Tables 2010](#) for more findings, statistical tables and methodologies for the SUTs and IOTs.

2.3 Of the \$835.5 billion produced, \$272.4 billion was consumed by the domestic industries for intermediate use while \$563.1 billion was used for final demand, namely private consumption expenditure (PCE), government consumption expenditure (GCE), gross capital formation (GCF) and exports of goods and services, as shown in Exhibit 2. Exports accounted for \$387.5 billion or 46 per cent of total domestic output, reflecting the economy's high dependency on external demand.

Exhibit 2 : Use of Domestic Output by Broad Categories, 2010



2.4 In 2010, Singapore imported \$302.4 billion of goods and services. The domestic industries used \$257.7 billion of imported intermediate inputs in the production process while final users imported \$44.6 billion. These flows of goods and services are captured in the domestic use table shown in Table 1. Exhibit 3 shows how GDP by the three approaches, namely production, expenditure and income, are derived using the figures from Table 1.

Exhibit 3 : Derivation of GDP at Current Market Prices, 2010 (in billion dollars)

<b>GDP =</b> <b>\$322.4</b>	<b>Production Approach (P)</b>
	Output – Intermediate consumption + Taxes on products 835.5 – 531.1 + 17.9
	<b>Expenditure Approach (E)</b>
	Final demand – Total imports 624.7 – 302.4
	<b>Income Approach (I)</b>
	Compensation of employees + Gross operating surplus + Taxes less subsidies on production + Taxes on products 126.1 + 173.9 + 4.5 + 17.9

Note: Figures may not add up to the total due to rounding.

Table 1 : Domestic Use Table, 2010

Billion Dollars

Sales by Product	Purchases by Industry											Total Intermediate Use	Final Demand					Total Use
	Mfg	Utl	Oth Gds	Constr	Trade	Accom & F&B	Tpt	Info-com	Fin & Ins	Biz	Oth Ser		PCE	GCE	GCF	Export	Total	
Total Intermediate / Final Use at Purchasers' Prices	226.8	10.7	0.1	37.9	53.0	8.0	66.1	22.8	30.9	40.0	34.8	<sup>P</sup> 531.1	114.5	32.8	89.8	387.5	624.7	1,155.8
Domestic Production	85.7	5.5	0.1	30.6	29.4	5.4	27.6	10.7	18.5	32.9	26.0	272.4	83.2	32.8	59.5	387.5	563.1	835.5
Mfg	54.6	0.4	0.0	5.9	1.1	1.6	4.0	1.8	0.4	3.6	3.4	76.7	4.0	0.0	8.0	191.2	203.3	280.0
Utl	4.2	3.5	0.0	0.1	0.6	0.6	0.5	0.2	0.2	0.8	1.5	12.3	2.4	0.0	0.0	1.4	3.7	16.0
Oth Gds	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2
Constr	0.4	0.1	0.0	19.0	0.0	0.1	0.0	0.0	0.0	1.4	0.2	21.3	0.0	0.0	29.4	0.8	30.3	51.5
Trade	11.4	0.2	0.0	1.5	1.5	0.4	1.0	0.1	0.0	0.3	0.7	17.3	10.9	0.0	3.6	87.6	102.1	119.4
Accom & F&B	0.3	0.0	0.0	0.2	0.3	0.1	1.5	0.1	0.2	0.6	0.3	3.4	10.3	0.0	0.0	0.0	10.3	13.7
Tpt	3.6	0.1	0.0	0.7	9.9	0.1	14.2	0.5	0.5	1.6	0.4	31.5	6.1	0.0	0.0	53.8	59.9	91.4
Infocom	1.5	0.1	0.0	0.3	2.3	0.1	0.9	4.1	2.3	2.2	2.6	16.3	2.8	0.0	2.6	9.4	14.8	31.1
Fin & Ins	1.5	0.2	0.0	0.4	3.5	0.2	0.9	0.5	11.4	6.5	4.2	29.2	7.2	0.0	0.0	25.2	32.4	61.6
Biz	7.4	0.8	0.0	2.3	9.7	2.2	4.1	3.1	3.5	15.6	5.4	54.0	17.5	0.8	16.0	17.0	51.2	105.2
Oth Ser	0.7	0.0	0.0	0.2	0.5	0.1	0.6	0.3	0.1	0.4	7.2	10.3	22.0	32.1	0.0	1.0	55.0	65.3
Imports of Goods & Services	141.0	5.2	0.0	7.3	23.5	2.5	38.3	12.1	12.2	7.0	8.6	257.7	17.8	0.0	26.8	0.0	44.6	<sup>E</sup> 302.4
Taxes on Products	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.9	13.6	0.0	3.5	0.0	17.0	<sup>P, I</sup> 17.9
Value-Added at Basic Prices	65.0	4.9	0.1	14.2	58.1	5.9	25.5	11.0	33.1	53.8	32.7	304.4	0.0	0.0	0.0	0.0	0.0	304.4
Taxes less Subsidies on Production	0.6	0.2	0.0	0.5	0.3	0.2	0.5	0.1	0.0	1.5	0.6	4.5	0.0	0.0	0.0	0.0	0.0	<sup>I</sup> 4.5
Compensation of Employees	20.6	1.0	0.1	7.8	19.5	3.2	8.7	6.2	16.5	18.3	24.0	126.1	0.0	0.0	0.0	0.0	0.0	<sup>I</sup> 126.1
Gross Operating Surplus	43.8	3.7	0.0	5.9	38.3	2.5	16.3	4.7	16.6	34.0	8.0	173.9	0.0	0.0	0.0	0.0	0.0	<sup>I</sup> 173.9
Total Inputs	291.8	15.6	0.3	52.1	111.1	13.9	91.6	33.8	64.0	93.8	67.5	<sup>P</sup> 835.5	114.5	32.8	89.8	387.5	<sup>E</sup> 624.7	1,460.2

Note: Figures may not add up to the total due to rounding.

  Components of GDP, by Production approach (P)        Components of GDP, by Expenditure approach (E)        Components of GDP, by Income approach (I)

Mfg = Manufacturing    Oth Gds = Other Goods    Trade = Wholesale & Retail Trade    Tpt = Transportation & Storage    Fin & Ins = Finance & Insurance    Oth Ser = Other Services  
 Utl = Utilities    Constr = Construction    Accom & F&B = Accommodation & Food Services    Infocom = Information & Communications    Biz = Business Services

### 3. INPUT-OUTPUT TABLES

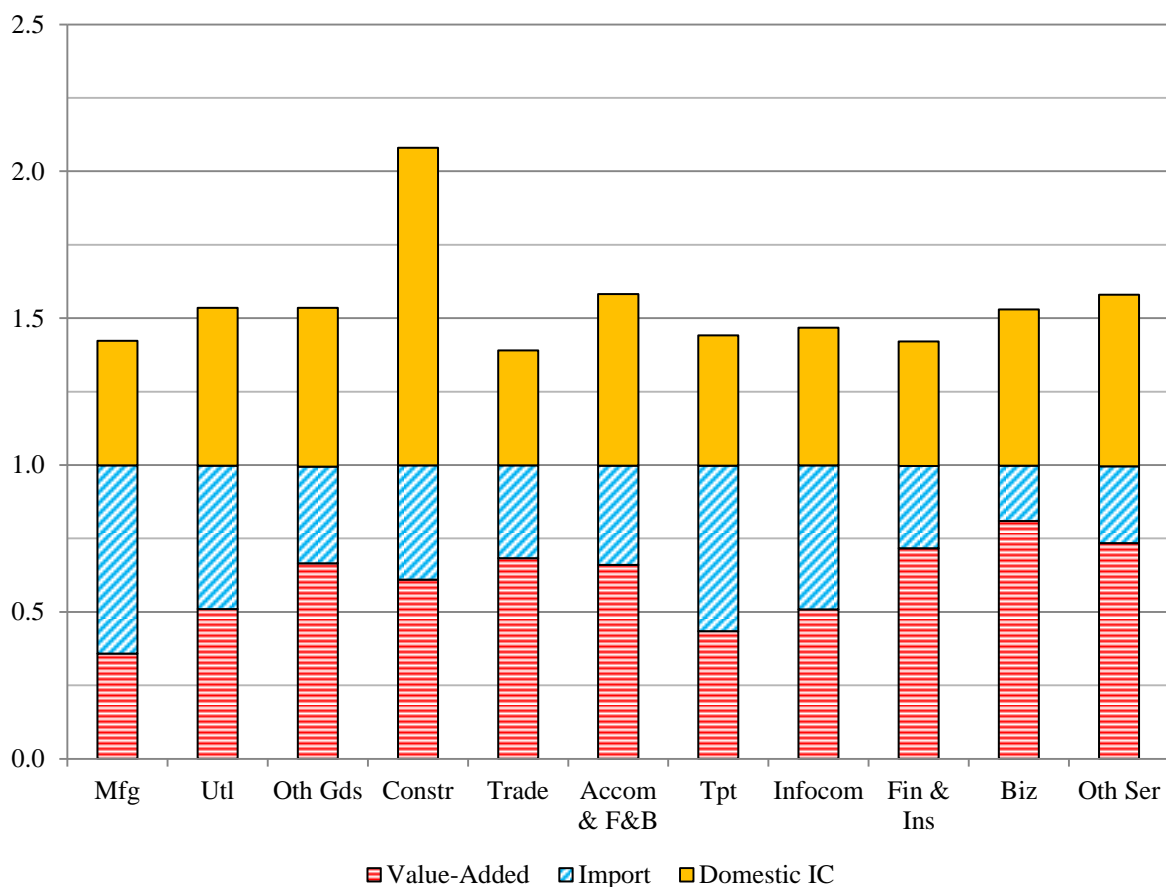
3.1 IOTs are derived from SUTs and are used for various economic analysis. This section presents some of the applications of the symmetric IOTs, for example, multipliers, linkages and net foreign exchange earnings.

#### Multiplier Analysis

3.2 Multiplier analysis is one of the main applications of symmetric IOTs. A multiplier is a ratio that measures the impact on the total economy as a result of an initial exogenous change in any of the final demand components. The relationship between the initial autonomous change and the total impact on the entire economy generated by the change is known as the multiplier effect.

3.3 Different multipliers are generated for different analysis. The most commonly used multipliers are output, value-added (VA), income, import and employment multipliers. Exhibit 4 shows the import, domestic intermediate consumption (IC) and VA multipliers of the 11 industrial sectors generated from the 2010 IOTs. For example, a \$1 increase in the final demand of the construction sector will eventually lead to an additional \$2.08 of output (comprising \$0.61 of VA, \$0.39 of imports and \$1.08 of domestic IC) being generated for the whole economy.

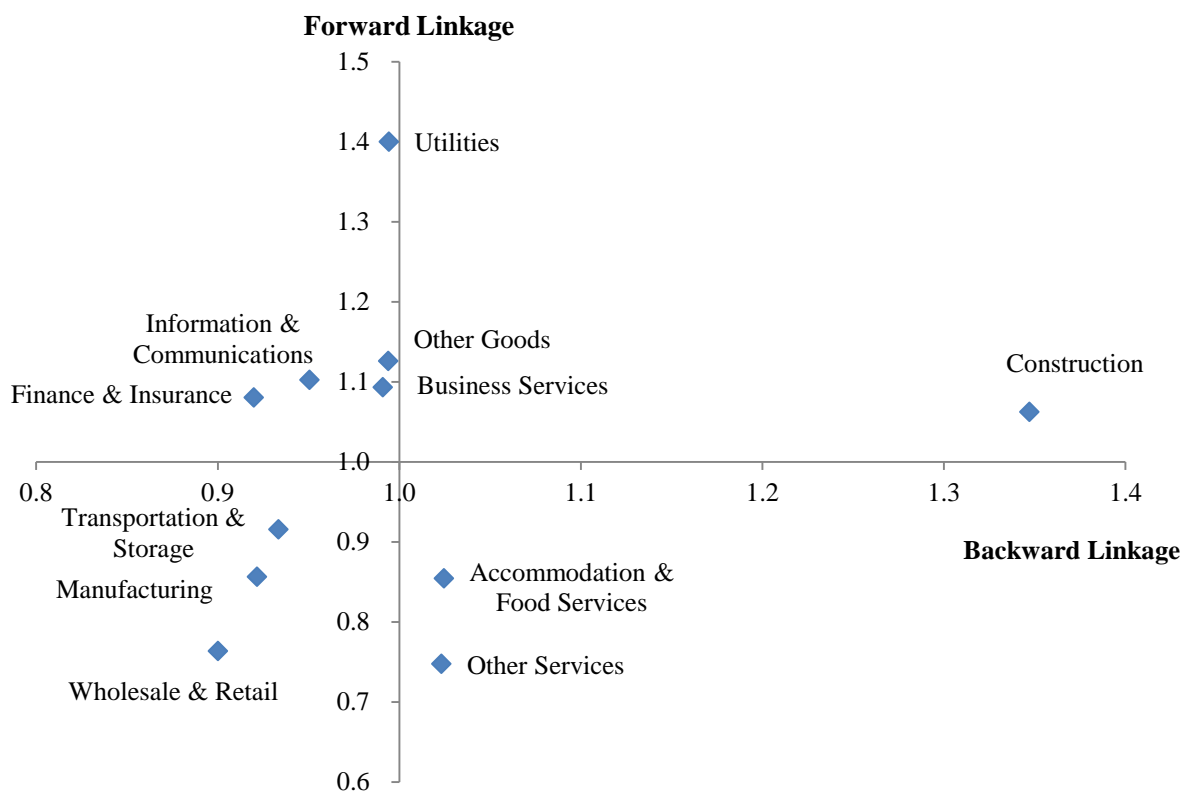
Exhibit 4: Simple Multipliers by Industrial Sector Per Dollar Change in Final Demand, 2010



## Linkage Analysis

3.4 Another application of the IOT is linkage analysis. *Backward linkages* are demand-oriented and trace the changes in output that occur further back along the supply chain when there is a change in demand of a particular industry's output. For example, an increase in demand for the output of the manufacturing sector will increase the output of the sectors from which the manufacturing sector purchases its inputs. *Forward linkages* are supply-oriented and trace the changes in output that occur further forward along the supply chain when there is a change in demand of a particular industry's output. For example, an increase in the supply of manufacturing sector output will imply additional amounts of manufacturing output are available to be used by other sectors for their production. Exhibit 5 shows the linkages for the 11 industrial sectors.

Exhibit 5: Backward and Forward Linkages, 2010



Type of Linkages	Interpretation	
Backward	Industry's dependency on domestic industries supply	< 1 Below average dependency
Forward	Domestic industries' dependency on the industry	> 1 Above average dependency

3.5 The utilities sector had the highest forward linkage, indicating that the services provided by the sector were essential to all other domestic industries in the economy. On the other hand, the other services sector which includes social services had the lowest forward

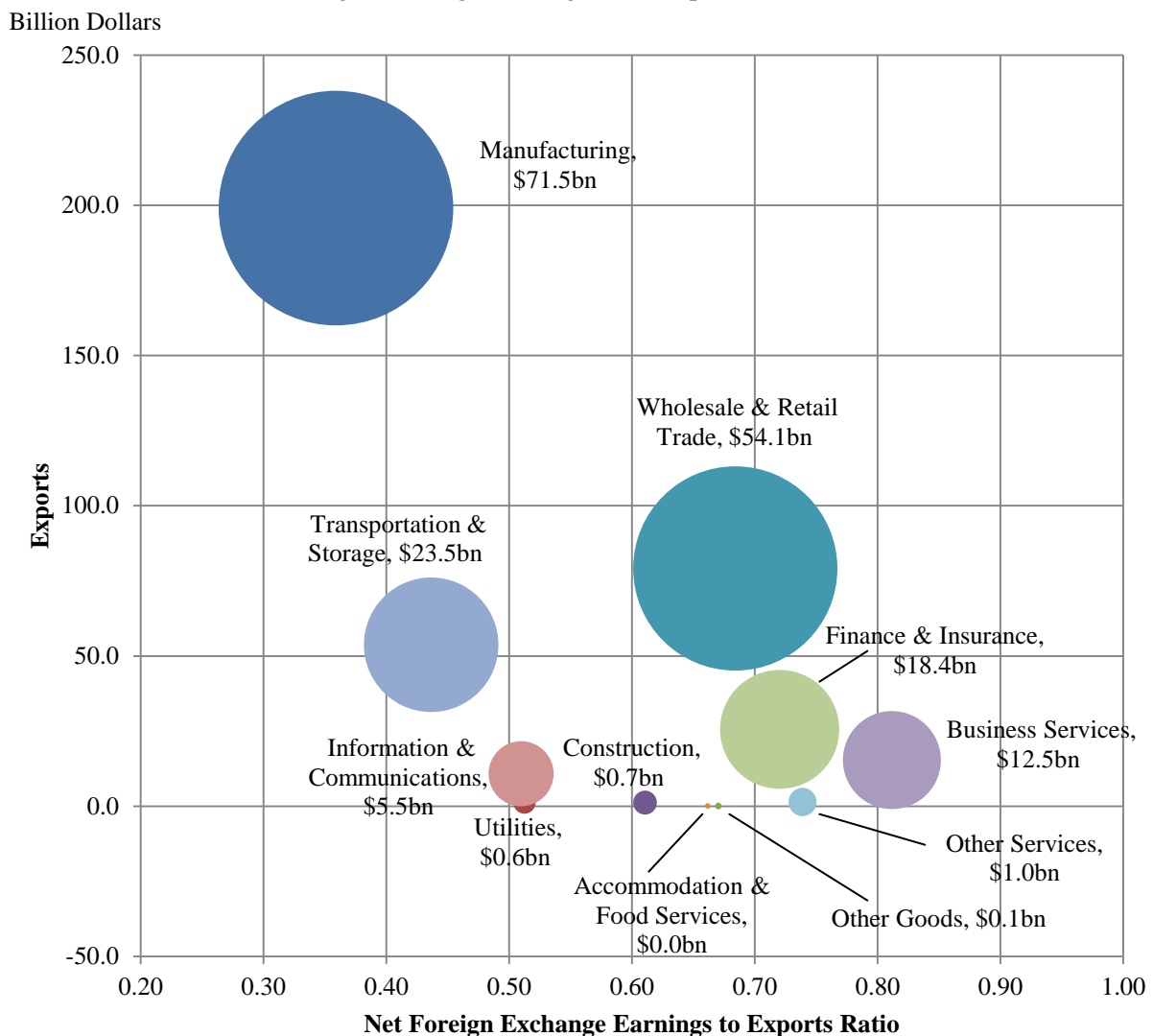
linkage, indicating that it supplied a smaller proportion of its output as intermediate inputs to the domestic economy.

3.6 The construction sector had the highest backward linkage in 2010 and also the highest output multiplier as backward linkage is directly proportional to output multiplier. A high backward linkage suggests that a sector is highly dependent upon other domestic industries for its input requirements. Conversely, the manufacturing sector had low backward linkage, a reflection of its higher dependence on imported inputs.

### Net Foreign Exchange Earnings

3.7 The IOT can also be used to estimate the net foreign exchange earnings, broken down by industrial sector. Net foreign exchange earnings are defined as total foreign exchange earnings from domestic exports minus the import requirements to produce these exports. The ratio of net foreign exchange earnings to total domestic export gives an indication of the value-added generated from domestic exports. Exhibit 6 shows the net foreign exchange earnings of the 11 industrial sectors.

Exhibit 6: Net Foreign Exchange Earnings from Exports, 2010 (in billion dollars)



3.8 Of the 11 sectors, the manufacturing sector contributed the most net foreign exchange earnings, amounted to \$71.5 billion. However, its net foreign exchange earnings as a ratio to its total domestic exports was lower than those of other sectors, indicating that the manufacturing sector had a relatively higher import requirement. Generally, sectors with relatively lower import requirements have higher VA per unit of exports.

#### **4. CONCLUSION**

4.1 In summary, the 2010 SUTs were used to derive and reconcile the three GDP estimates in the rebasing of Singapore's national accounts to reference year 2010. They were also used to derive IOTs for assessing the impact of changes in final demand on the economy, examining linkages to identify key sectors of the economy and analysing structural changes in the economy.