THE ROLE OF TRADE IN THE ECONOMIC DIVERSIFICATION OF BRUNEI DARUSSALAM

by

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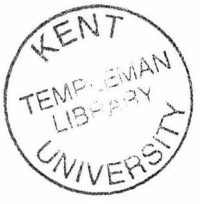

DECLARATION

I hereby certify that the work embodied in this thesis is the result of my own investigation except where reference has been made to published literature.

I declare that this work has not already been accepted in substance, nor is it currently being submitted in candidature for any other degree.

In Memory

My Father, My First Economics Teacher

TABLE OF CONTENTS

ABSTRACT

Brunei's intention to diversify the economy away from oil and gas had become a national development objective since the beginning of the third National Development Plan in 1975. There were two major policy initiatives to achieve this: the establishment of a ministry responsible for promoting and facilitating the non-oil industrial development in 1989 and the formation of an industrial development board in 1996. By evaluating the progress made in the development of non-oil trade, this thesis will be the first to analyse the Brunei diversification policy efforts using disaggregated trade data. The main finding is that there is evidence that economic diversification has taken place, although the process has not been rapid. The types of products that can be promoted as a strategy for the diversification policy and their potential markets have also been identified. These include garments, metal manufacturing and fish products. It is also found that there is a need for improvement in the competitiveness of these products.

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LIST OF TABLES

APPENDICES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

"We have to put our earnest efforts in diversifying the economy particularly through the expansion of the industrial base and the active participation of the private sector."

His Majesty the Sultan and Yang Di-Pertuan of Brunei Darussalam
9th National Day Royal Address, 23 February 1993.

1.1 Introduction

Brunei Darussalam (hereafter Brunei) is situated on the north-west coast of Borneo island, flanked by two Malaysian's states, Sabah and Sarawak, and has a total area of 5,765 square kilometres. It is divided into four districts, Brunei-Muara, Belait, Tutong and Temburong. Of the four districts, Brunei-Muara, where the capital Bandar Seri Begawan is located, and Belait, are the main hub of economic activities. The least developed is Temburong which is largely covered by tropical forest.

Brunei gained its independence in 1984 after being a British Protectorate from 1888 until 1959 when a new constitution was enacted which allowed the transfer of power from the British Resident to the Sultan. During the early part of this period, Brunei was traditionally a nation of self-sufficient peasants and fishermen (Gunn, 2001) and the economy was based on timber, rubber and coal (Cleary and

Wong, 1994 and Heeks, 1998). Oil was first discovered in 1929 and became the main source of income until today.

The history of oil goes back to the late 19th century when north-west Borneo became the interest of oil explorers. It was not until 1929 that oil was first discovered and began to be exported in 1932. Since then, oil has become the main source of income for Brunei. In the late 1930s, oil exports accounted for around three-quarters of total exports and Brunei became the largest single oil producer in the British Empire (Cleary and Shuang, 1994). The success story of oil continued when in 1963, Brunei's first offshore and gas field known as South-West Ampa, was discovered. During the early 1970s, Brunei was producing about 140,000 barrels per day (bpd) and soared in 1974 producing at 225,000 bpd. In 1981, a policy to conserve oil reserves was introduced. The National Petroleum Depletion Policy placed limits on oil production to about 150,000 bpd. However, due to global happenings such as the Gulf War in early 1990s, the UN ban on Iraqi's oil export and the fluctuation of world's oil price and oil demand, oil production in Brunei has exceeded the conservation level. In 2003, Brunei had proven crude oil reserves of 1.35 billion barrels (US EIA, 2004). Brunei is the third largest oil producer in Southeast Asia after Indonesia and Malaysia.

Natural gas, on the other hand, turned into liquefied natural gas (LNG), began its massive production in 1973. In the late 1980s, average daily production was around 1,000 million cubic feet and has been increasing since. Today, Brunei produces around 366 billion cubic feet (Bcf) of natural gas and is the fourth largest producer of LNG in the world and the third largest producer in Southeast

Asia (US EIA, 2004). About 80% of gas produced is exported while the remaining is for domestic consumption particularly for the generation of electricity. Exports of LNG go to 3 customers in Japan, namely Tokyo Gas, Tokyo Electric and Osaka Gas. Brunei has an estimated 13.8 trillion cubic feet natural gas reserve (Brunei LNG, 2005).

The dominance of oil and gas in the Brunei economy can be seen from its share of GDP, government revenue and total exports. This can be seen in Table 1.1. Although the oil and gas share of GDP shows a declining trend over the years, the oil and gas share of government revenue and total exports are however, still high.

Table 1.1: Contribution of Oil and Gas Industry to GDP, Government Revenue and Total Export, 1979-2003 (Per cent)

Year	Oil and gas share of GDP (%)	Oil and gas share of Government Revenue (%)	Oil and gas share of Total export (%)
1979	82.40	97.46	98.43
1980	83.32	98.47	98.58
1981	79.39	98.72	98.91
1982	76.60	98.26	99.03
1983	73.85	97.96	98.90
1984	70.72	97.69	98.74
1985	69.35	97.54	98.49
1986	54.89	94.26	97.17
1987	55.79	92.45	97.51
1988	47.87	90.47	97.54
1989	47.34	89.31	96.94
1990	49.54	89.97	96.53
1991	46.76	88.89	96.73
1992	43.20	86.74	95.14
1993	39.88	89.19	96.35
1994	36.71	91.25	93.25
1995	37.45	81.66	92.53
1996	35.62	83.01	92.70
1997	34.50	80.56	91.11
1998	34.47	78.03	87.68
1999	39.39	84.40	83.27
2000	41.31	87.35	89.72
2001	39.64	90.10	89.34
2002	38.95	89.91	88.10

Sources: Brunei Darussalam Statistical Yearbook (various issues)

With the current oil reserve expected to last only for another 25 years, the need for economic diversification in Brunei is '*not a question about choice or option – rather it is a question of survival*' as succinctly stated by the Minister of Energy (ASEAN Affairs, 2008).

In the next section we will look at the specific issues commonly faced by countries that are dependent on mineral industries.

1.2 Issues Faced by a Small Oil-Dependent Economy

The fate of many oil-producing countries changed following the oil price increases in the 1970s. Countries which had been relatively poor found themselves to be relatively wealthy. This includes Brunei. The oil price increase brought large revenues to Brunei even though annual oil production was relatively constant. These revenues paved the way for rapid modernisation and the establishment of a virtually complete welfare state in Brunei.

However, the existence of a large quantity of minerals, such as oil and gas, has been a mixed blessing to the economic development of countries that are dependent on these resources. Many studies show the negative outcomes resulting from the over-dependence on the mineral sector. These include the studies of the 'Dutch disease' (Davis, 1995), the 'resource curse thesis' (Auty, 2001; and Sachs and Warner, 2001) and the phenomenon of becoming a 'rentier state' (Beblawi and Luciani, 1987).

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Gylfason (2001 and 2004) emphasizes five main channels through which natural resource intensity can have inhibitive economic growth effect. An overvalued currency as a result of a surge in foreign exchange sold following an export boom was the first symptom with the Dutch disease. It tends to reduce the production of other industries, in particular, the manufacturing and the agriculture sectors that may be particularly good for growth over time. The effect of the Dutch disease however can be avoided through an efficient management of the abundant oil wealth as is the case for Norway and its Petroleum Fund. The fund acts as a stabilizing mechanism that prevents the revenue windfall from distorting the domestic income and the real exchange rate.

The second channel is through the rent-seeking behaviour of producers or in some instances, the governments, who are receiving huge rents from the natural resources. The main problem of rent-seeking is that it diverts factors of productions away from more socially fruitful economic activity. In extreme cases, it can also lead to the corrosion of social capital through corruption and income inequality. Auty (1993) also worries that overly optimistic projections of minerals prices and rents by governments may lead to unproductive investment hence 'tardy diversification' that inhibits long-run growth.

Natural resource intensity is also found to crowd out human capital which is important for growth. Gylfason et al (1999) have shown that across countries, public expenditure on education, expected years of schooling and school enrolment are inversely related to natural resource abundance.

The fourth and the fifth channels through which the natural resource intensity inhibits growth are related to financial development. Natural resource abundance blunts the incentives to save and invest productively. Specifically, when the share of output accrues to the owners of natural resource rises, the demand for capital falls which will lead to lower real interest rates, hence retarding the development of financial institutions which will then have an implication on growth.

Besides the above inhibitive growth channels, natural resource industries are also disfavoured because of its enclave effect as they tend to have lower forward and backward linkages effects as compared to manufacturing industries (Hirschman, 1958; Davis, 1995 and Mikesell, 1997). Furthermore, substantial volatility in mineral prices results in the fluctuation of export and fiscal revenue, hence making domestic demand unstable which would then have an unfavourable effect on investment (Davis, 1995). As a result, many of these mineral-rich countries have embarked on diversification policies aimed at increasing the contribution of other sectors in the development of their economies.

If we now turn to Brunei, it can be shown that some aspects of rent-seeking behaviour actually exist that is very similar to the rent-seeking behaviour of oil states in the Arab region. For example, as according to Abdel-Fadil (1987), the government, who is the main recipient of the rent, often wants to redistribute its revenue among the population through public sector employment and the creation of welfare states, characterised by the provision of free public goods and services and imposing virtually no tax.

This characteristic can be found in Brunei. As can be seen from Table 1.2, more than 45 per cent of the local labour force is employed in the public sector during the 1980s and the 1990s. The declining share in 2001 however was accompanied by an increase in the local employment share of the oil and gas sector, thus retaining the latter sector's status as the biggest employer of the local labours.

Table 1.2: Local Employment Distribution in Brunei, 1971-2001 (persons).

Year	Public Sector Employment	Private Sector Employment	
		Oil & gas	Non-Oil & Gas
1971	15,579 (39.0)	4,622 (11.6)	19,811 (39.4)
1981	31,726 (46.6)	6,847 (10.1)	29,555 (43.3)
1991	48,998 (45.9)	9,092 (8.5)	48,656 (45.6)
2001	54,865 (37.5)	15,954 (10.1)	75,435 (51.6)

Note: Figures in parentheses are percentage share.

Sources: Brunei Darussalam Statistical Yearbooks, various issues

Along with zero personal income tax[1], Bruneians have also enjoyed a vast amount of welfare and infrastructural provisions free of charge including health and education. In relation to this, it is however important to mention that Brunei recognises the need to invest on its human capital. This can be seen through the government expenditure on education, the secondary school enrolment and the number of schools which have increased over the years (Table 1.3). However, one important aspect relating to the effectiveness of these efforts is the quality of the

[1] The only income tax in Brunei is the corporate tax i.e. tax on the profit of corporations.

investment. This is difficult to evaluate since the only available data only reflect quantity rather than quality.

Table 1.3: Government Expenditure on Education, Secondary School Enrolment and Number of Schools, 1971-2001

Year	Expenditure on Education (B$ Million)	Secondary School Enrolment (Persons)	Number of Schools
1971	27.9	11,599	140
1981	134.6	17,375	174
1991	234.6	25,370	194
2001	512.0	34,632	249

Sources: Brunei Darussalam Statistical Yearbook, various issues.

Another main issue faced by Brunei is in relation to its size. With a population of about 370,000 people in 2005, Brunei can be categorised as a micro state. Small states tend to have certain characteristics that can lead to economic vulnerability (Briguglio, 1995; Armstrong et al, 1998; and Sutton, 1999). These include a small domestic market, vulnerability to significant exogenous shocks and a limited labour capacity.

All of the problems related to the small economic size also exist in Brunei. The small domestic market in fact has been recognized in the National Development Plans as one of the main challenges to economic diversification. Domestic economic activities in countries such as Brunei usually fail to achieve a critical mass necessary for efficient output production due to the small domestic demand. This means the unit cost of local production is high. The small domestic market also serves as a natural barrier to entry. Because of the small number of feasible

incumbent firms, competition is reduced, hence exposing the market to the adverse effects of monopoly or oligopoly.

The shortage of local labours at both ends of the skill spectrum i.e. professionals and blue-collar workers, is also another challenge faced by the Brunei economy. In 2001, there were more than 75,000 foreign workers and expatriates working in Brunei which constitutes about 52.4 per cent of the total labour force.

Brunei is also vulnerable to external volatility due to its high degree of dependence on imports for its consumption and production needs (Duraman and Hashim, 1998). This exposure to exogenous global shocks according to easterly and Kraay (2000) can result in growth volatility.

1.3 Economic Diversification Policy in Brunei

In the last section, we have seen the specific issues faced by mineral-dependent economies which give enough reasons why these countries need to diversify their economies away from mineral-based. Besides those reasons, the issue of over-dependence on the oil and gas industry is starting to become more pressing in Brunei. In the last 15 years Brunei has seen an increasing population. The average annual population growth rate is about 2.6 percent, one of the highest in the region. The increasing population has triggered a growing demand for food, clothing, construction goods and other goods and services, which currently are met largely by imports. Such rising import demand pose no difficulties for the

balance of payments since the oil and gas exports are sufficiently high to meet import costs. However, in the long run this may no longer be sustainable.

In addition, there is an issue of sustaining the income of its citizens. Presently, the public and the oil and gas sectors are important vehicles for distributing the income from the oil and gas to its people. About half the local labours are employed in these sectors as can be seen in Table 1.2. With the oil and gas depleting, the government can no longer sustain its status as the main employer. As a result, unemployment is rising. In 2001, the unemployment rate rose to 7.2 per cent from 4.9 per cent in 1995.

The need for economic diversification had been recognized as early as in the first National Development Plan (1953-8) where diversification was seen as vital. However, it was only in the third National Development Plan (1975-79) that diversification became one of the eight main national development objectives and it became the central development theme:

> " *Diversification was needed to reduce the structural imbalance and resources had to be focused to accelerate the development of sectors consistent with the balanced development of the whole economy.*" (Brunei Government, 1975).

Economic diversification continued to become one of the key objectives in the subsequent national development plans with a large number of industries proposed to be developed as can be seen in Table 1.4.

Table 1.4: Summary of Proposed Industries and Budget Allocations in Brunei National Development Plans

National Development Plan	Proposed Industry	Budget Allocation
3rd Plan (1975-1979)	1. Agriculture: Rice, sweet corn, yellow beans and cattle grass. 2. Livestock: meat and eggs. 3. Castor oil plant 4. Tree crops: pineapple plantations and palm oil estates 5. Fisheries: marine fish 6. Forestry: Timber production 7. Other mineral resources: glass, pottery, clay and ceramic; 8. Tourism; 9. Oil and gas Downstream Industries: Ammonia and Urea plan.	B$ 35.2 Million (6.6 %)
4th Plan (1980-1984)	1)Rice production 2)Livestock production: goat farm, cattle breeding. 3)Uplands crop: maize, soya beans, cowpeas for animal feeds 4)Fisheries: fresh water fish 5)Forestry: timber production 6)Other minerals: Silica land in Tutong (with reserves of 20 million tons), sand mining and pottery/tile industry. 7) Agro industries: vegetable oil, castor oil, animal feed, leather works, oil-palm, fruit juice and puree factory, orchard growing for export, coconut oil extraction and fibre factory.	B$ 64.2 Million (3.7 %)
5th Plan (1986-1990)	1) Agriculture: Rice, Tropical Fruits, Vegetables; 2) Livestock Industry: Cattle, Buffalo, Goats, Chicken; 3) Fisheries: Marine fish, Aquaculture and Fish meal; 4) Forestry: Plywood, Fibre-board; 5) Manufacturing: Food processing, Furniture, Potteries and Tiles, Textiles: high value added types of garments using modern and traditional technologies, Chemicals and dyes, Plywood and Wood panelling, Glass from silica sands in Tutong 6) Tertiary Industry: Banking and finance, Insurance and Maintenance services;	B$343.5 Million (9.3 %)
6th Plan (1991-1995)	1) Industry: Mini steel plant and Glass 2) Agriculture : Rice, Hydrophonic vegetables, Eggs and poultry, Local fruits and production of seedlings and Horticulture; 3) Forestry :Rattan plantation for furniture industry; 4) Fisheries	B$ 550.9 Million (10 %)
7th Plan (1996-2000)	1) Oil and gas Downstream Industry: Ammonia/Urea, Methanol, Export Oriented Refinery, Other Petrochemical - plastics and paints; 2) Primary Sector: Agriculture and Fishery	B$ 907.6 Million (12.6 %)
8th Plan (2001-2005)	1) Oil and gas Downstream Industry; 2) Manufacturing Industry: Value-added industry such as food processing, Garments and Furniture; 4) Primary Sector: Agriculture, Livestock and Fishery; 5) Tourism and Trade: Eco-tourism and Traditional Cottage industries: 6) Services: Banking, Finance and Insurance and other export specialized services including law, accounting, architecture and estate management; 7) ICT for k-economy; 8) Transhipment activities.	B$ 1,127.6 Million (15.5 %)

Sources: Brunei National Development Plans (various issues)

As a major policy initiative, the government, in 1989, established the Ministry of Industry and Primary Resources, as the ministry responsible to oversee the development of non-oil industries. The ministry offers different kinds of incentives to producers and investors of the non-oil industries including agricultural subsidies, tax incentives and offering financial schemes to the small and medium enterprises. In 1996, the ministry set up the Brunei Industrial Development Authority (BINA), dubbed as the 'One Stop Agency' which has the role of an investment coordinator. It serves as a focal agency that caters to the needs for all investors including the disseminating of relevant information and the requirements of other government agencies that are needed in order to set up businesses in Brunei. The BINA also establishes a number of industrial development areas throughout Brunei that are offered to any potential and viable investors with minimal rentals. Such industrial sites are complete with basic infrastructure. In 2000, a total of 705 hectare was developed into industrial sites.

In 2001, a statutory board known as the Brunei Economic Development Board (BEDB) was established, as an agency responsible for the development of the small medium enterprises (SMEs) and also the focal point for foreign investors. The Economic Development Board (Amendment) Order 2001 widen the role of the BEDB as the government's prime mover in attracting foreign direct investment into Brunei. Also in the same year, Brunei issued two decrees namely the Investment Incentives Order and the Income Tax (Amendment) Order that contained reforms in the form of production and export incentives to attract investment.

Central to the diversification policy are two strategies numerously mentioned in the various National Development Plans (fifth, sixth, seventh and eight). These are the development of non-oil exports and import-substitution industrialisation. For example, industries such as 'potteries and tiles', 'glass'[2] and 'wood panelling' were particularly identified to be developed as export potentials. Other industries like 'agriculture', 'food manufacturing' and 'furniture' were identified as the types of industries that could support the import-substitution policy. In the eighth National Development Plan, six promoted sectors were identified to be developed. These were the halal-food industry, tourism, financial service industry, transhipment, fishery and agriculture.

Despite the efforts made to mobilize the development of the non-oil products, there have been claims that the diversification progress has been slow. Ali (1992) claims that '*progress in achieving these goals has been slower than expected and certainly it is less than desired*'. This, according to him, is reflected in the size of public sector which has failed to decline in terms of relative employment. Cleary and Shuang (1994) looked at the agriculture sector and found little development. Similarly, their short analysis of the manufacturing sector also showed the lack of progress and development.

Besides the above observations, it is also interesting to note that despite the priority given to the attainment of economic diversification, the allocations of the national budget showed the contrary as can be seen in Table 1.4. Industrial development was only allocated about 6 per cent of the total budget while the rest

[2] Brunei has a large deposits of clay and high quality silica sands that can be used to develop the pottery and glass industries.

went to infrastructural development and public services. In the 8th National Development Plan (2001-2005), the budget allocation for industrial development increased to about 15 per cent. The detail of the budget allocation to each sector, however, is not available which would have been useful in assessing the impact of the diversification policy.

In light of the above mentioned summary of diversification policy and efforts in Brunei, it seems that diversification is defined as the search for as many viable alternatives as possible to the production of oil in the future rather than identifying and promoting industries on which Brunei had some potential already. Being a micro state, the development of an ambitious diversification programme, one that can create many alternative industries, may not be economically viable. What Brunei needs is to optimize its limited resources into the search and the development of a few niche industries based on its strengths and the available opportunities.

1.4 Motivation of the Thesis.

The effect of the increasing globalisation on the domestic policies can no longer be ignored. Thus, the importance of trade to the development of the Brunei economy and its role in the economic diversification process are recognized. For a country that has a small population[3] like Brunei, trade plays a big role. Imports have become and will continue to become the source of supply of goods into Brunei. Exports on the other hand, not only will be the source of income, but will

[3] In 2006, Brunei population was about 380,000 people.

be the answer to the woe of having a small home market. In addition, the recurring emphasis on the development of non-oil exports in the National Development Plans which implies the government's recognition of the benefits that increasing exports can bring and the existence of export opportunities brought about by globalisation. All of these lead us to investigate the progress of non-oil trade as the outcome of the diversification policy.

Despite the emphasis given to the diversification policy as the key strategy to Brunei's economic development, however, there is a serious lack of empirical study to evaluate the policy and efforts made. Most of the past literature is also often not supported by an empirical analysis (for example Tisdell, 1998 and Duraman *et al*, 1998). The lack of published and reliable data, however, could be the main reason for the dearth of such analysis. To the best of our knowledge, this thesis will be the first to analyse in a rigorous way the Brunei diversification policy, using a great deal of unpublished data supplied by the Department of Economic Planning and Development and other government agencies.

1.5 Objective of the Thesis

Our approach to the study of economic diversification in Brunei will be mainly through trade analysis. There are two main objectives. One is to look at, and evaluate, the diversification policy and the various efforts which have been undertaken by the government. The second is to find out the types of products and industries which have the potential for development.

1.6 Data and Methodology

The main challenge for this thesis has been the serious lack of reliable published data. For instance, Brunei did not produce GDP value added data until 2000, nor does it have export and import price indices needed to deflate trade data into real terms. We had to resort to a number of sources which were often in the form of unpublished raw data. Our main sources of data are from the United Nations Commodity Trade Statistics Database (COMTRADE) available direct from their website and the Department of Economic Planning and Development, for both published and unpublished (including raw) data. We also use data from the Brunei Custom Department.

This lack of data has limited our choice of methodology in the empirical analysis. Where data were available, the quality is often poor, which did not allow us to make use of extensive econometric analysis. Thus, we rely on non-parametric approach as our methodology in all chapters with the exception of chapter 3. Each chapter will start with a discussion of the methodology and data to be employed.

1.7 Structure of the Thesis

Altogether there are seven chapters in the thesis. Chapter two aims to look at the change in the structure of production and trade in Brunei before and after the diversification policy was announced in 1989. Using the Herfindahl-Hirschman

index we investigate whether there has been any change in the concentration of production and trade.

Chapter three specifically looks at the structure of trade and the effects of diversification policy. The main objective is to answer whether or not the diversification policy has had any effects on the growth of non-oil exports. We use an ARDL model to estimate the short-run and the long-run price and income elasticities of exports and imports at the aggregate and disaggregated level.

Chapter four examines Brunei's apparent comparative advantage of the main export commodities and calculates the 'productivity level' associated with these commodities. The highlight of this chapter is in identifying new types of commodities that Brunei could export and the potential markets for these products.

Following our findings of a number of untapped realistic opportunities for the non-oil exports available in a number of markets in the previous chapter we focus our analysis on each of the identified products and markets in chapter five. We also present the types of production incentives available in Brunei as part of the export-promotion strategy. Using the shift and share analysis, we look at Brunei's export competitiveness in each of the product categories and in each market vis-à-vis a group of selected ASEAN member countries, which are Brunei's close competitors.

Chapter six turns to import analysis. We give an overview of protection in Brunei. We then investigate the effects of the protection on locally produced commodities in terms of their capability in meeting domestic demand, through the calculation of import penetration ratio. We then use the shift and share method to find out the performance of Brunei's imports relative to other countries.

Chapter seven concludes and offers some policy recommendations and suggestion for possible areas of future research.

CHAPTER 2

STRUCTURAL CHANGE

2.1 Introduction

Chenery and Syrquin (1975) have argued that the transformation of economic structure occurs through the interaction of three factors. The first are universal factors which are related to the level of income. Second are factors specific to individual countries such as the natural resource endowment. And the third, the social objectives and the government's choice of economic policies which play an equally important role in the structural change of an economy.

Since Brunei began its production of oil in the 1930s, Brunei's economic structure can be divided into two distinct sectors, oil and non-oil. The contribution of the latter sector which mainly consist of agriculture, forestry and fishing industries dropped when the world oil price increased in the 1970s. Oil and gas became dominant and Brunei became dependent on the sector.

Having recognized the danger of depending on the non-renewable and depleting resources, the government through its series of national development plans made the call to diversify the economy. Economic diversification became the national development objective as early as the 1950s. However, it was only in the mid 1970s that diversification became a national development objective with the main strategies of developing the non-oil exports and import-substitution

industrialization[4]. The establishment of the Ministry of Industry and Primary Resources in 1989 was seen as the government's major effort to diversify the economy.

This chapter aims to look at the changes in the structure of production and trade in Brunei before and after the major diversification effort in 1989. Specifically, we investigate whether there has been any change in the concentration of production and trade. A higher level of concentration in the structure of production and trade implies that Brunei has not been successful in its diversification policy. With the available data, our analysis covers the years 1974 up until 2003. The analysis will be mainly based on the use of descriptive methodologies. Section 2.2 will describe the data and methodologies used to measure concentration. Section 2.3 will proceed with the production analysis. Sections 2.4 and 2.5 will, in turn, look at the structural change in exports and imports, respectively. Finally, section 2.6 concludes.

2.2 Methodology and data

The mostly widely used index of economic concentration is the Herfindahl-Hirschman index (HH index). Gutiérrez de Piñeres and Ferrantino (1995), Lederman and Maloney (2003) and Hasan and Toda (2004) have employed the HH index in their analysis of export concentration of developing countries, Evans *et al.* (2006) used it as one of the indicators in the assessment of the welfare impact of regional trade agreements, while Clarke and Davis (1993) have used it

[4] Some of the targeted industries to be developed were 'potteries', 'furniture', 'glass' and 'food products'.

to measure the concentration of the UK manufacturing industry. The index is given by:

$$HH = \sum_{i}^{n} \left(\frac{x_i}{\sum_{i}^{n} x_i} \right)^2$$

where x is the element we are interested in, such as exports or output, n is the total number of products and i stands for a particular product. A value close to 1 implies almost complete concentration in one industry or one export, and a value close to 0 implies a high degree of diversification.

We have also adopted a measure of the change in trade/production composition which gives a slightly different interpretation than the Hirschman concentration index. This method used by Gutiérrez de Piñeres and Ferrantino (1995) to measure the change in Chilean export composition is calculated as

$$CS = \sum_{i=1}^{n} \min\left(s_{i,t}, s_{i,t-1}\right)$$

Where $s_{it} = \frac{e_{it}}{\sum_{i=1}^{n} e_{it}}$ is the share of industry i's exports or output (e_i) in total exports or output in year t.

CS takes a maximum value of 1, implying short-run stability in the export or output composition, and takes a minimum value of 0, if the country exports or produces goods which were not exported or produced in the previous year.

We have 15 broad industries including the oil industry in our analysis of the production structure of Brunei. The other 14 industries are 1) agriculture; 2) forestry; 3) fishing; 4) electricity, gas and water; 5) construction; 6) wholesale; 7) retail trade; 8) restaurants and hotel; 9) transport, storage and communication; 10) bank and finance; 11) insurance; 12) real estate and business services; 13) ownership of dwellings and community; and 14) social and personal services. Our data sources come from the Department of Economic Planning and Development for the period 1974 until 2003.

For the trade analysis, we mainly use the data from the United Nations' Standard Industrial Trade Classification (SITC revision 1) which was available from their website COMTRADE. However the year began in 1980. Since there were some missing data, we also used the raw trade data from the Department of Economic Planning and Development of Brunei

Because Brunei does not categorise its trade data into end-use categories i.e. consumption, intermediate and capital goods, we convert import data (SITC Rev 1) into meaningful aggregates of the end-use of goods based on the United Nation's Broad Economic Categories (BEC) classification. We also aggregate the export data into 'oil', 'non-oil manufacturing' and 'agriculture'.

2.3 Structural Change in Production

Basic development theory points out that as a country develops, it is expected to undergo changes in the sectoral composition of its production. A country typically

begins as a primary producer, then shifts into manufacturing and at a later stage engages in more service activities. This is known as the Fisher-Clark thesis (Clark, 1940; Johnston, 1970).

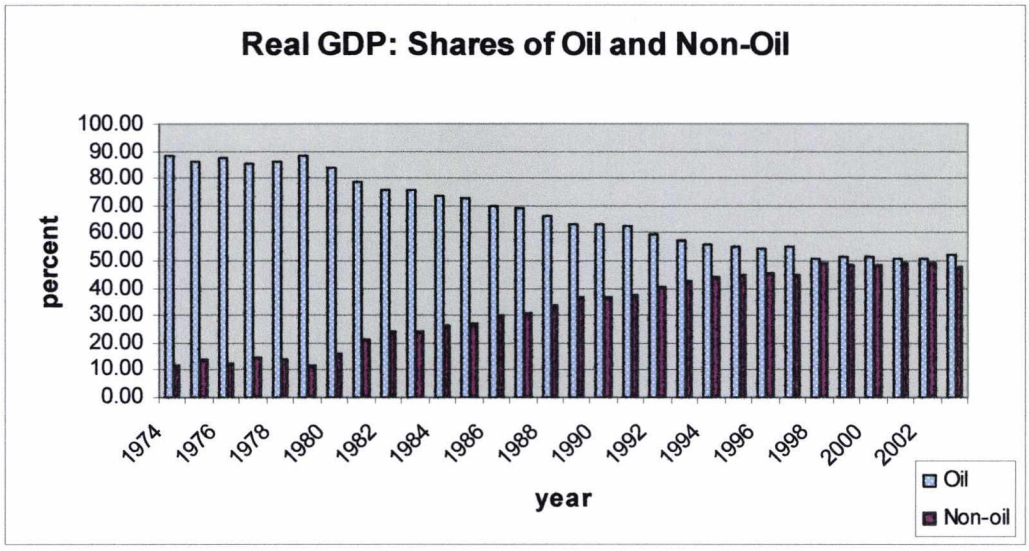
According to Duraman (2003), prior to the discovery of oil in 1929, the economic development of Brunei was largely linked through to semi-subsistence agriculture and fishery. Inland people established their living through the harvesting of jungle produce and the production of settled farming such as rice cropping, while people who lived in the water villages on the Brunei river, depended largely on fishing and small cottage industries, such as silversmith and cloth-weaving, The mode of trading was via river using the barter system.

When Brunei started its oil export in the 1960s, the economy was then divided into two distinct categories, oil and non-oil, where the former eventually started to dominate in the 1970s. Through the revenues from oil and gas, Brunei has established itself as having one of the highest per capita GDP in the region. The high dependence of Brunei's economy on its non-renewable resources put a pressure on Brunei government to maintain the sustainability of the economic growth and development. Hence, the need for viable economic substitutes in place as sources of national income, before the inevitable depletion of the oil and gas reserves, which is predicted to occur in about 25 years. .

Figure 2.1 shows the share of oil and non-oil output to real GDP over the period 1974 to 2003. As we can see, the oil share dwarfed the non-oil share in the 1970s

up until late 1980s when the non-oil share began to increase. The shares of both outputs appear to be stable and equal in size in the later period.

Figure 2.1
Shares of Oil and Non-Oil in Real GDP, 1974-2003



Source: Department of Economic Planning and Development

We now focus our analysis on the non-oil sector. The non-oil sector comprises of 14 industries. These sectors are agriculture; forestry; fishing; electricity, gas and water; construction; wholesale; retail trade; restaurants and hotel; transport, storage and communication; bank and finance; insurance; real estate and business services; ownership of dwellings and community; and social and personal services. The share of each industry can be seen in Table 2.1.

As we can see, the biggest contribution from the non-oil sector comes from the services industries: social and personal services, bank and finance and insurance. In contrast, the share of the primary industries namely agriculture, forestry and fishery, is very small throughout the years.

Table 2.3 shows the compound annual growth rates[5] of each sector before the diversification policy was fully implemented (1974-1988) and after (1989-2003) while Figure 2.2 shows the average shares of each sector in the two sub-periods.

We then compare the performance of each industry before and after the diversification policy was embarked on 1989. First, we look at the average growth rates of each industry which are shown in Table 2.3. It is interesting that almost all of the non-oil industries have a higher average growth rate before the ministry was set up in 1989, with the exception of two industries: agriculture and fishing.

In terms of the percentage shares of each industry to the real non-oil GDP shown in Figure 2.1, a number of industries saw increasing shares after the policy was implemented. These are mainly the services industries which include 'community, social and personal services', which consistently have the biggest share; 'insurance'; 'transport, storage and communication' and 'restaurants and hotel'. This result implies the importance of the services sector in the development of the non-oil sector in Brunei. Meanwhile, none of the primary industries have shown any substantial increase in the share after the diversification policy took off.

[5] Compound annual growth rate is calculated by $CAGR(t_0, t) = \left(\frac{V(t)}{V(t_0)} \right)^{\frac{1}{t-t_0}} - 1$

Table 2.1: Shares of Non-Oil Activities in Real GDP, 1974-2003 (%)

Year	1	2	3	5	6	7	8	9	10	11	12	13	14	15	Total
1974	1.04	0.12	0.18	0.23	1.34	0.44	1.57	0.24	0.54	0.49	0.03	0.47	0.46	4.42	11.07
1975	0.99	0.16	0.19	0.24	1.95	0.53	1.74	0.37	0.82	0.82	0.03	0.66	0.50	4.67	12.80
1976	0.76	0.17	0.12	0.28	1.87	0.51	1.60	0.33	0.81	0.70	0.02	0.69	0.45	4.30	11.74
1977	0.66	0.16	0.14	0.17	1.94	0.53	2.05	0.31	0.87	0.92	0.05	0.92	0.43	5.07	13.34
1978	0.69	0.13	0.14	0.07	1.56	0.54	2.01	0.33	1.04	0.92	0.05	1.07	0.43	5.18	13.15
1979	0.62	0.12	0.12	0.00	1.44	0.51	1.55	0.26	0.83	1.18	0.04	0.72	0.37	4.26	10.99
1980	0.77	0.12	0.10	0.00	2.31	0.68	1.91	0.32	0.87	1.62	0.09	1.37	0.35	6.45	15.64
1981	0.71	0.22	0.13	0.20	3.29	0.96	2.48	0.46	1.07	2.16	0.16	1.61	0.45	8.55	20.17
1982	0.76	0.24	0.12	0.28	3.76	1.90	3.51	0.52	1.65	2.16	0.10	1.75	0.45	8.81	22.86
1983	0.77	0.19	0.18	0.26	3.45	1.16	2.62	0.58	2.26	2.24	0.21	2.01	0.47	9.36	23.08
1984	0.81	0.20	0.16	0.25	2.64	1.61	2.29	0.47	1.81	2.45	0.15	2.05	0.48	13.53	25.93
1985	0.83	0.22	0.17	0.49	2.06	0.91	2.00	0.47	2.08	2.43	0.22	1.72	0.50	14.45	26.50
1986	0.96	0.22	0.16	0.49	2.31	1.20	2.62	0.59	1.65	2.04	0.19	0.76	0.53	17.31	28.87
1987	1.00	0.23	0.17	0.51	2.28	1.40	2.78	0.64	1.88	2.13	0.27	0.75	0.53	17.28	29.71
1988	1.05	0.15	0.19	0.65	2.27	1.32	2.99	0.70	2.01	2.25	0.38	0.75	0.54	19.26	32.35
1989	1.14	0.24	0.21	0.81	2.81	1.60	3.30	0.78	2.22	2.44	0.55	0.76	0.56	20.05	35.14
1990	1.19	0.14	0.23	0.85	2.83	1.55	3.26	0.84	2.34	2.54	0.76	0.74	0.57	19.99	35.41
1991	1.15	0.14	0.23	0.83	2.79	1.49	3.16	0.85	2.28	2.44	0.74	0.71	0.55	21.12	36.00
1992	1.17	0.14	0.25	0.87	2.85	1.53	3.21	0.91	2.43	2.54	0.78	0.74	0.58	23.52	38.87
1993	1.17	0.14	0.27	0.86	2.91	1.54	3.20	0.97	2.51	2.63	0.79	0.75	0.60	25.00	40.56
1994	1.15	0.14	0.27	0.86	3.04	1.56	3.16	1.05	2.62	2.74	0.82	0.76	0.62	26.28	42.16
1995	1.13	0.14	0.28	0.86	3.19	1.58	3.15	1.13	2.73	2.85	0.86	0.77	0.64	27.08	43.26
1996	1.19	0.14	0.28	0.81	3.25	1.64	3.29	1.18	2.85	3.07	0.91	0.79	0.68	27.20	43.90
1997	1.18	0.14	0.28	0.73	3.45	1.68	3.40	1.22	2.98	3.20	0.93	0.82	0.76	25.73	43.02
1998	1.25	0.15	0.31	0.81	3.45	1.84	3.69	1.33	3.19	3.52	1.01	0.93	0.82	28.72	47.13
1999	1.21	0.15	0.31	0.75	3.46	1.86	3.74	1.35	3.20	3.57	1.01	0.94	0.83	28.32	46.85
2000	1.18	0.14	0.29	0.76	2.96	3.85	3.08	1.36	3.81	3.39	1.03	0.78	0.81	26.89	46.68
2001	1.31	0.15	0.38	0.74	2.86	3.80	3.16	1.25	3.57	3.81	0.92	0.68	0.78	27.07	46.60
2002	1.23	0.17	0.53	0.75	2.71	4.01	3.89	1.33	3.58	3.83	1.04	0.76	0.56	27.04	47.21
2003	1.30	0.16	0.55	0.76	2.18	4.23	3.82	1.25	3.89	3.86	1.18	1.01	0.64	26.69	47.32

Source: Own calculations. Notes: 1) agriculture; 2) forestry; 3) fishing; 4) electricity, gas and water; 5) construction; 6) wholesale; 7) retail trade; 8) restaurants and hotel; 9) transport, storage and communication; 10) bank and finance; 11) insurance; 12) real estate and business services; 13) ownership of dwellings and community; and 14) social and personal services.

Table 2.2

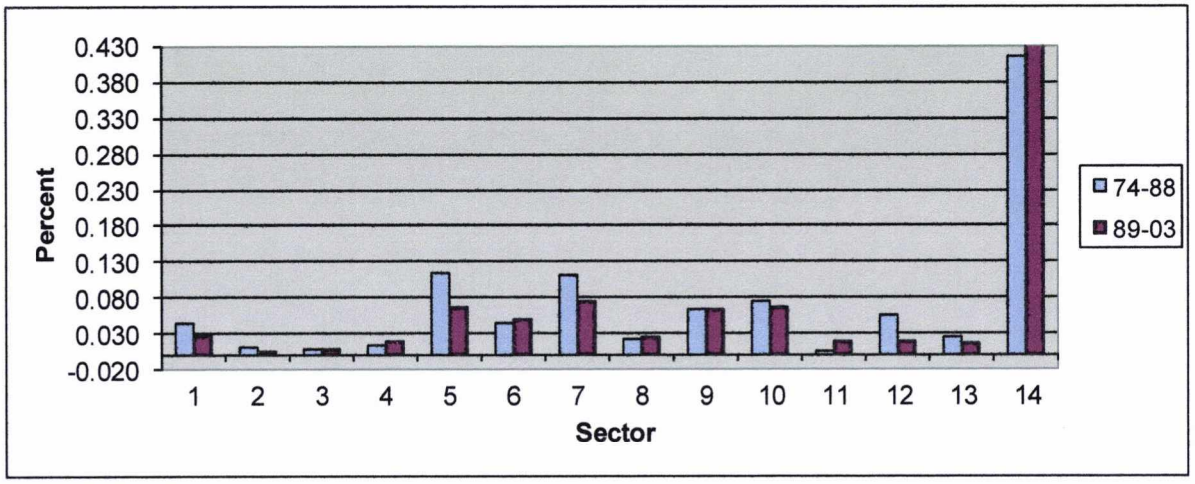
Average Growth Rates of Non-Oil Activities

Year	1	2	3	5	6	7	8	9	10	11	12	13	14	15	Total
Gr74-89	2.274	4.044	2.411	10.172	6.108	10.562	7.013	10.159	12.217	13.975	21.276	5.636	3.453	13.523	10.487
Gr89-03	**2.827**	-0.890	**9.073**	1.374	0.036	9.227	2.970	5.412	6.060	5.288	7.666	4.006	2.839	3.990	4.233

Source: Own calculations

Figure 2.2

The shares of the Non-Oil Industries in the Real Non-Oil GDP, Before and After Diversification Policy



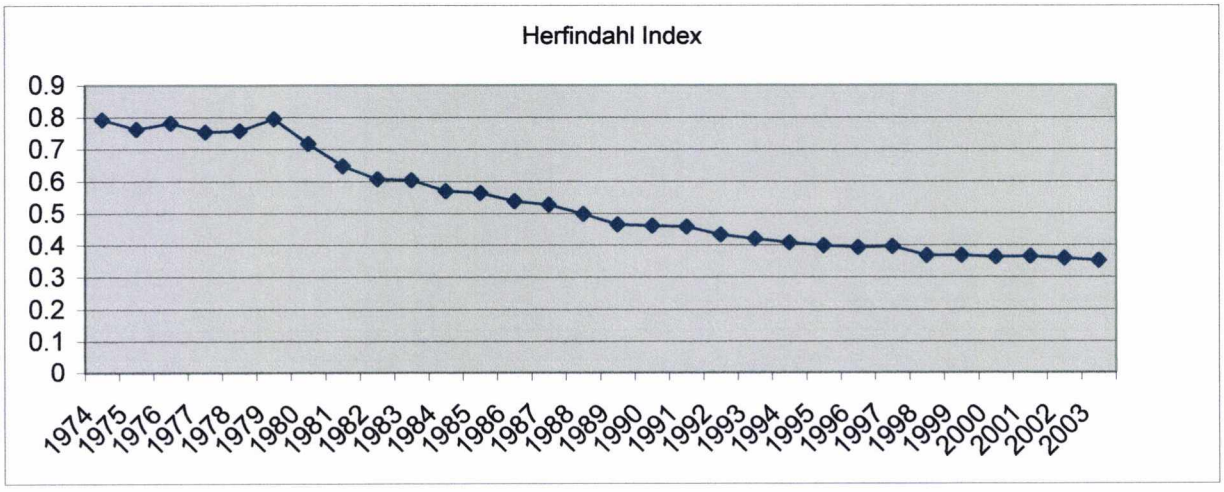
Source: Own calculations.
Notes: 1) agriculture; 2) forestry; 3) fishing; 4) electricity, gas and water; 5) construction; 6) wholesale; 7) retail trade; 8) restaurants and hotel; 9) transport, storage and communication; 10) bank and finance; 11) insurance; 12) real estate and business services; 13) ownership of dwellings and community; and 14) social and personal services.

We now turn to the level of concentration which is measured by the Hirschman-Herfindahl index (HH). Figure 2.3 shows that the level of production concentration was high during the 1970s. It then started to decrease in 1980 which was the result of the oil conserving policy introduced that year, and continued to decline steadily until 2003, implying that structural change had taken place during the period. For the values of index, see Appendix table A2.1.

Now, one interesting question is to find out the rates at which the diversification took place before and after the diversification policy was implemented in 1989. This can be answered by measuring the slopes of the HH index, before and after 1989. We measure the Herfindahl index in the period 1974-1988 and 1989-2003. The slopes are -0.023 and -0.008 respectively, implying a faster speed of diversification actually occurred before 1989, not after.

Figure 2.3

Concentration of Production

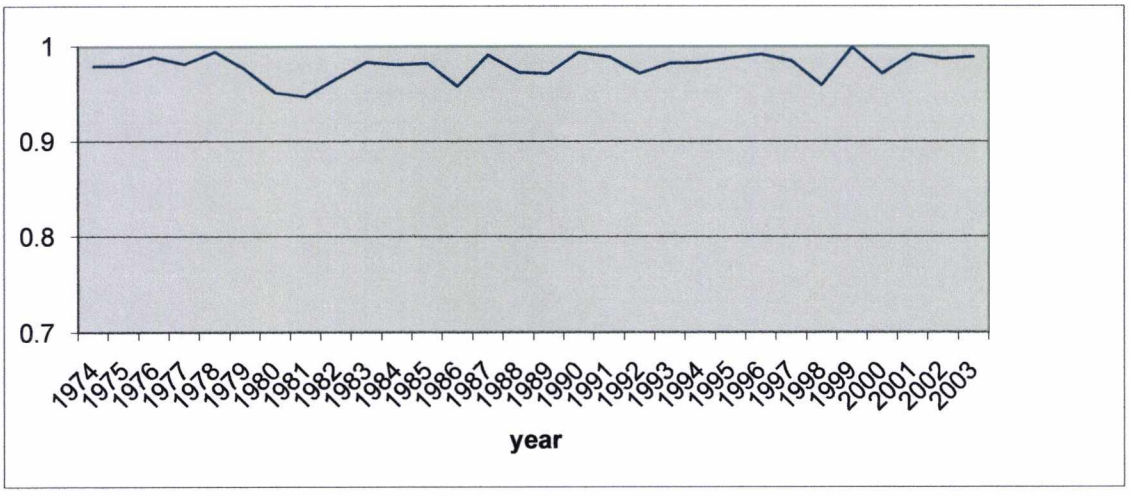


Source: Own calculation.

The analysis of stability in the production based on the change of composition index (CS index), on the other hand, shows that the production pattern has generally been stable with little fluctuations throughout the period (see Figure 2.4).

Figure 2.4

Change in Production Composition index



Source: Own calculations.

2.4 Structural Change in Exports

The composition of Brunei's exports is largely made up of oil and gas (SITC 3). For the purpose of analysing structural change, we separate the non-oil exports into two types, agriculture and non-oil manufacturing. We use exports of 'food and live animals' (SITC 0) and 'animal and vegetable oils and fats' (SITC 4) as the agriculture exports, while the non-manufacturing exports consist of 'beverages and

tobacco' (SITC 1), 'chemicals' (SITC 5), 'manufactured goods by materials' (SITC6) 'and 'miscellaneous manufactured articles' (SITC 8)[6].

Table 2.3 shows the composition of Brunei's exports during the period studied. Although oil and gas continue to make up more than 90 percent of total exports, the manufacturing exports begin to show some improvements in the early 1990s. The contribution of agricultural exports, however, is negligible at less than 1 percent.

Table 2.3

Composition of Brunei's Exports (Per cent)

Year	Oil and gas	Non-oil manufacturing	Agriculture
1980	98.59	0.87	0.05
1981	98.93	0.64	0.05
1982	99.04	0.34	0.06
1983	98.91	0.40	0.08
1984	98.76	0.59	0.13
1985	98.51	0.44	0.16
1986	97.18	0.88	0.44
1987	97.53	0.89	0.45
1988	97.54	0.88	0.63
1989	96.94	1.11	0.51
1990	96.53	1.39	0.64
1991	96.74	1.54	0.37
1992	95.14	1.75	0.50
1993	96.35	1.21	0.57
1994	93.28	2.49	0.57
1995	92.92	3.28	0.10
1996	92.70	3.18	0.06
1997	91.12	3.73	0.04
1998	87.69	6.42	0.04
1999	83.29	7.19	0.04
2000	89.73	5.63	0.03
2001	89.34	6.46	0.04
2002	88.03	7.12	0.04
2003	87.67	6.72	0.04

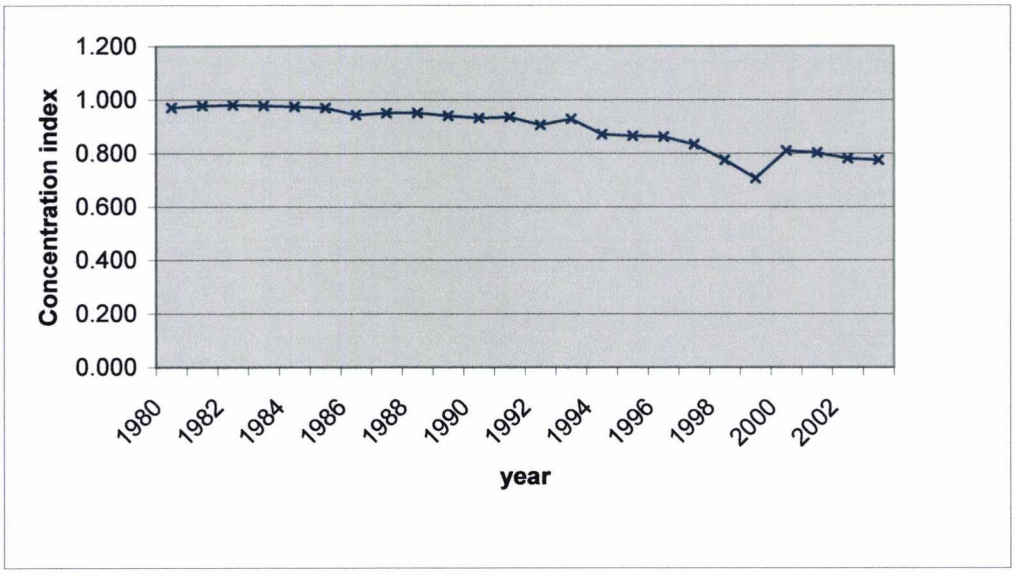
Source: own calculation.

[6] In total, there are 10 export categories. The remaining ones are 'crude material inedible except fuel (SITC 2)', 'machinery and transport equipment (SITC 7)' and 'miscellaneous transaction (SITC 10)'.

The dependency of Brunei exports on oil is reflected in the concentration index. Figure 2.5 shows that the curve is flat from 1980 until 1993 with values close to one. It then begins to decrease gradually from 1994 indicating that it took about 4 years for the diversification policy to bring about new developments in the export structure.

Figure 2.5

Concentration of Exports



Source: Own calculation

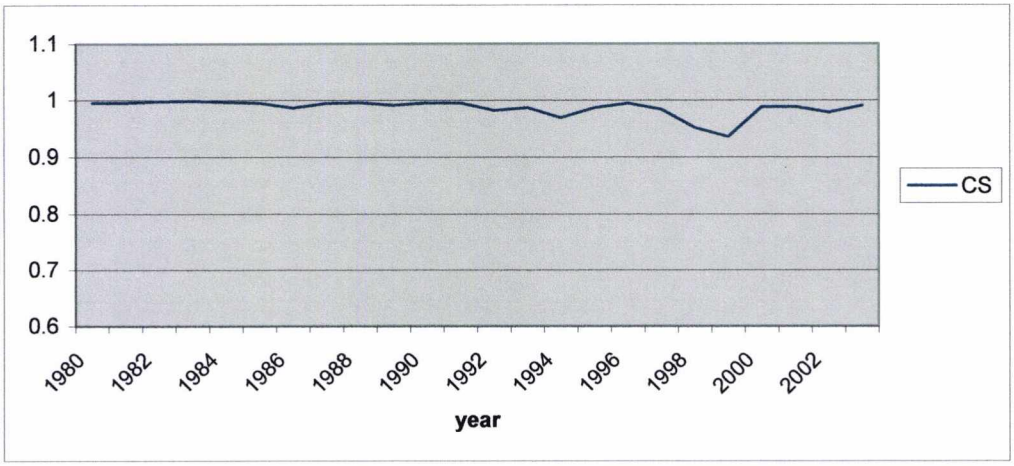
The CS curve for Brunei's exports depicted in Figure 2.6 shows that there has been a very high structural stability in the export composition throughout the period, except for the period 1998-1999, which has since stabilised. This result corresponds to the sudden 3 percent increase of manufacturing exports in 1998 (see Table 2.4) which was largely attributed to the increase in the export of garment products[7]. This

[7] Garment exports increased by about 83% in 1998.

increase in garment production, according to Duraman (2003), was due to the government policy of encouraging[8] the setting up of garment factories in Brunei in the mid 1990s.

Figure 2.6

Change in Export Composition index



Source: Own calculation

2.5 Structural Change in Imports

During the post war period, many developing countries followed the import substitution trade strategy which was characterised by policies that favour production for the domestic market (Adams, 1967; Bhagwati and Wibulswadi, 1972; Chenery and Syrquin, 1986). This inward-oriented strategy was then replaced by the export-promotion policy, characterised by policies that give incentives to production both for export and for import substitution. Recently, trade liberalisation, characterised by policies that give negligible incentives, has become the fashion and the trade policy choice for many countries (Yuko *et al*, 1986).

[8] The Brunei government offered tax incentives to local and foreign investors who set up garment factories.

For a small country, whose production is largely made up of oil and gas, Brunei has to rely heavily on imports to meet the demand for goods for both consumption and production. Nevertheless, the government also stated in the National Development Plans, its intention of adopting the import substitution policy as one of the strategies towards diversifying the economy.

To analyse the import structure, we disaggregated the import data into three categories, consumption goods, intermediate goods and capital goods[9], based on the United Nation's BEC classification..

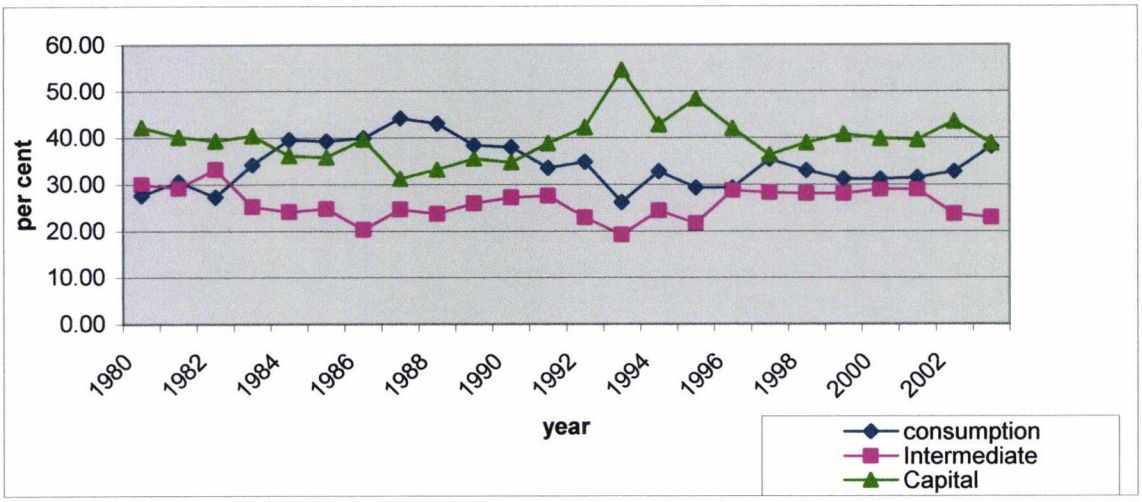
Figure 2.7 shows the share of each group in total imports (see Table A2.2 in the Appendix for the numerical data). As we can see, the import share of capital goods increased ever since the diversification policy was implemented in 1989, and reached its peak in 1993. Its share had always been higher than that of consumption goods and intermediate goods. The import of intermediate goods appeared to have the lowest share of the three. Meanwhile the import share of consumption goods

[9] We convert import data compiled on the SITC Rev 1, to meaningful aggregates of the end-use of goods i.e. consumption, intermediate and capital goods, based on the United Nation's BEC classification. Consumption goods comprise food (SITC 01-05), beverages and tobacco (SITC 1), articles of paper (SITC 642), textile products (SITC 656 and 657), glass (SITC 665), pottery (SITC 666), cutlery (SITC 696), domestic electrical equipment (SITC 725), passenger motorcars (SITC 7321), motorcycles (SITC 7329), bicycles (SITC 7331), clothing (SITC 84) and the rest of SITC 8 except 86.. Intermediate goods comprise crude materials except fuel (SITC 2), mineral fuels (SITC 3), chemical elements (SITC 51), crude chemicals (SITC 52), dyeing and colouring materials (SITC 53), fertilizers (SITC 56), paper and paperboard (SITC 64 except 642), textile yarns and fabrics (SITC 65 except 656 and 657),non-metalic mineral manufactures (SITC 66 except 665 and 666), iron and steel (SITC 67) and manufactures of metal (SITC 69 except692, 695 and 696). Capital goods comprise metal containers for storage and transport (SITC 692), tools for use in the hands and in the machine (SITC 695), machinery (SITC 71), electrical machinery (SITC 72 except 725), transport equipment (SITC 73 except 7321, 7329 and 7331) and scientific and control instrument (SITC 86). This classification is by no means perfect, but it makes the important distinctions of the different types of use of commodities.

fluctuates throughout the years, even surpassing the import shares of the other groups between 1985 and 1991.

Figure 2.7

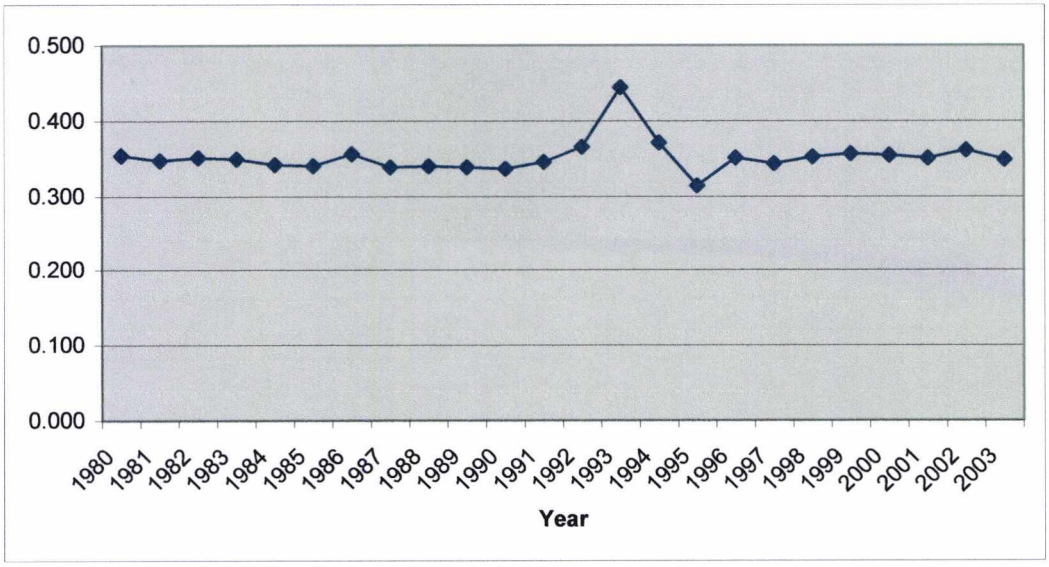
Composition of Brunei's Imports (Per cent)



Source: Own calculations.

We now turn to the index of concentration. The Herfindahl-Hirschman index curve in Figure 2.8 shows that there is an evidence of some diversification in the total imports throughout the period studied, with the index values ranges from 0.3 to 0.4.

Figure 2.8: Concentration of Imports

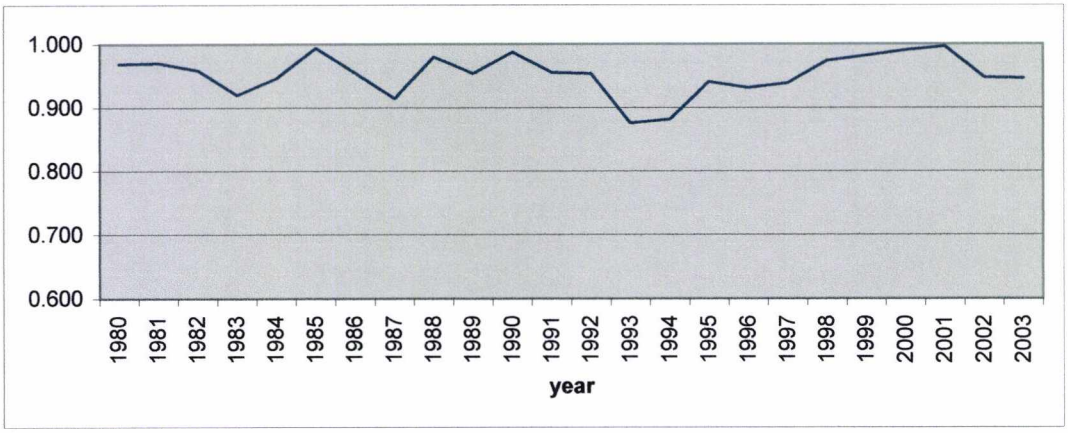


Source: Own calculations

Repeating what we have done in the previous section, the CS value is high throughout the period as depicted in Figure 2.9 implying a structural stability in the composition of imports.

Figure 2.9

Change in Import Composition index



SSource: Own calculations

2.6 Conclusion

There have been mixed results in our analysis of the effect of the diversification policy introduced in 1989. The production structure for instance showed some changes even before the diversification policy was embarked on. In fact, the speed of diversification was actually faster during the period before 1989. On the other hand, our analysis of exports shows that diversification took place only in the recent years, implying that the effect of the policy was not immediate. What we can conclude however is that the diversification policy introduced in 1989 did not hasten the diversification process as rapidly as might have been expected.

We have also seen the importance of the service industries to the economic development of Brunei. Their contributions to the non-oil sector are substantial. Therefore, while our study focuses on the production of goods, we recognize the potential of this sector in the diversification process. The government, in the eighth National Development Plan, had also emphasised the importance of this sector as a strategy for diversification. Banking, finance and insurance sector and tourism are the two types of service sectors to be developed and promoted. In 2000, the government established Brunei International Financial Centre as the main platform for the financial services sector to speed up growth. Similarly, in 2005 the Brunei Tourism Development Board was formed which serves as the national tourism organisation, in charge of tourism planning, development, planning and promotion.

APPENDICES TO CHAPTER 2

Table A2.1
Hirschman-Herfindahl Index, 1974-2003

	Production	Export	Import
1974	0.793	0.967	0.404
1975	0.764	0.975	0.394
1976	0.782	0.980	0.367
1977	0.755	0.980	0.346
1978	0.758	0.958	0.339
1979	0.795	0.968	0.367
1980	0.717	0.972	0.354
1981	0.647	0.979	0.348
1982	0.607	0.981	0.352
1983	0.604	0.978	0.350
1984	0.570	0.975	0.342
1985	0.563	0.971	0.341
1986	0.538	0.945	0.356
1987	0.526	0.951	0.339
1988	0.498	0.952	0.340
1989	0.464	0.940	0.339
1990	0.461	0.932	0.337
1991	0.458	0.936	0.346
1992	0.433	0.906	0.365
1993	0.420	0.929	0.444
1994	0.408	0.872	0.371
1995	0.400	0.865	0.314
1996	0.393	0.861	0.351
1997	0.396	0.833	0.343
1998	0.368	0.774	0.352
1999	0.369	0.706	0.357
2000	0.363	0.809	0.355
2001	0.365	0.802	0.351
2002	0.359	0.781	0.361

Source: Own calculations.

Table A2.2
Composition of Brunei's Imports (Per cent)

Year	Consumption goods	Intermediate goods	Capital goods
1974	21.02	52.30	26.68
1975	18.12	48.42	33.46
1976	22.71	34.38	42.91
1977	27.81	37.87	34.32
1978	32.38	36.54	31.08
1979	27.40	27.20	45.41
1980	27.64	30.05	42.31
1981	30.59	29.19	40.21
1982	27.31	33.30	39.40
1983	34.21	25.27	40.51
1984	39.61	24.20	36.18
1985	39.36	24.81	35.84
1986	39.94	20.29	39.77
1987	44.15	24.65	31.20
1988	43.08	23.73	33.20
1989	38.47	25.98	35.55
1990	38.05	27.22	34.73
1991	33.57	27.59	38.85
1992	34.84	22.96	42.20
1993	26.16	19.20	54.64
1994	32.77	24.41	42.82
1995	29.25	21.65	48.38
1996	29.26	28.71	42.03
1997	35.39	28.22	36.40
1998	32.96	28.02	39.01
1999	31.19	28.01	40.80
2000	31.15	28.96	39.89
2001	31.48	28.94	39.58
2002	32.80	23.67	43.53
2003	38.18	22.96	38.86

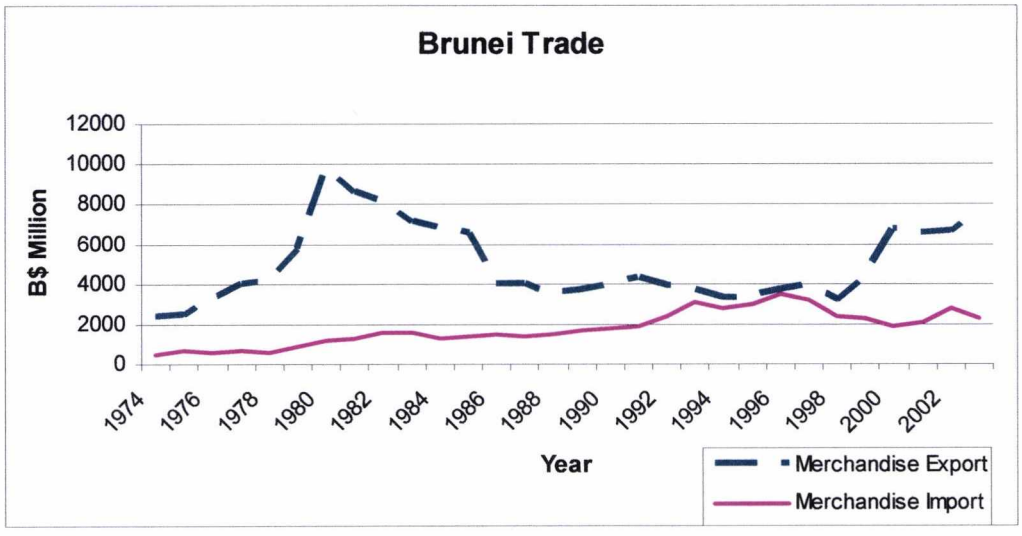
Source: own calculation.

CHAPTER 3
THE IMPACT OF DIVERSIFICATION POLICY ON NON-OIL TRADE

3.1 Introduction

Over the last three decades, trade has played a very significant role in the development of Brunei's economy. Brunei depends heavily on its merchandise imports to meet its consumption and production needs, while a higher value of exports, which consist of mainly oil and gas, have enabled Brunei to enjoy a trade surplus over the years. Figure 3.1, shows Brunei's trade balance since 1974. It peaked in 1981 after oil prices rose in 1979/80; then diminished, and has been growing again since 1996 as export revenue has been increasing and the value of imports falling.

Figure 3.1: Brunei's Exports and Imports

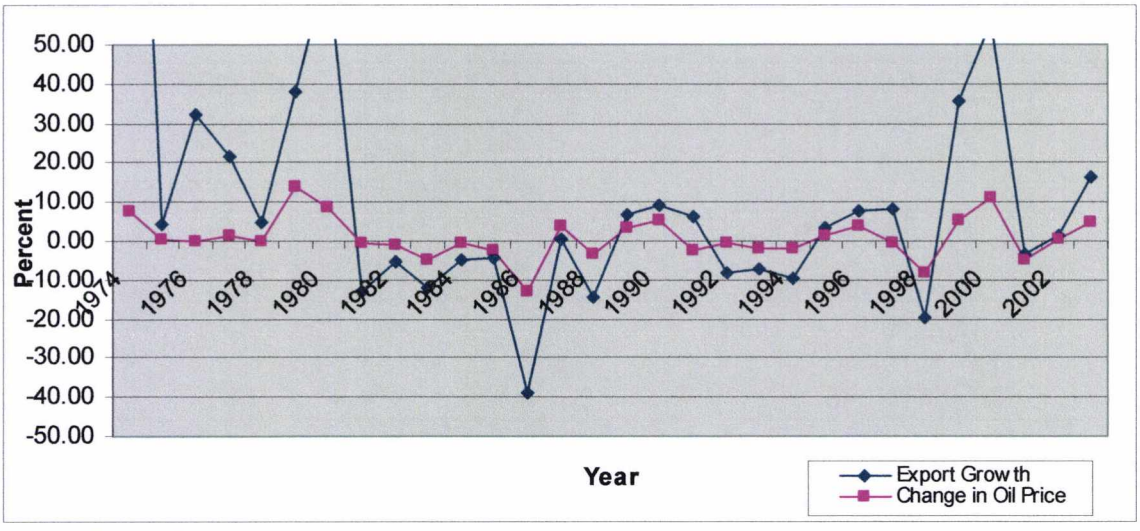


Source: Brunei Darussalam Statistical Yearbook (various issues).

The value of exports corresponds closely to the changes in the international oil price as shown in Figure 3.2 which graphs the annual growth rate of exports and the annual change of the oil price. This is to be expected since a large share of Brunei's exports consists of oil. This, however, also shows the vulnerability of Brunei's exports to forces outside of its control.

Figure 3.2

Total export growth and changes in oil price



Sources: Brunei Darussalam Statistical Yearbooks, various issues and own calculations.

The Brunei government recognizes the need to promote the development of non-oil exports as a long-term development strategy (Government of Brunei Darussalam, 1986). In 1989, the Ministry of Industry and Primary Resources was established, with the main functions of coordinating the diversification policy in Brunei and overseeing the development of the non-oil industries in Brunei. This was followed by the formation of the Brunei Industrial Development Board within the ministry in 1996, an agency responsible for investment in Brunei. Among others, it coordinates any investment needs through the liaison with other government agencies,

implements the export promotion policy and supports any import-substitution activities.

Very little empirical work has been done on Brunei's trade. Anaman and Buffong (2001) investigate the major determinants of aggregate import demand. Using the OLS method, they find that the real effective exchange rate, real GDP and population have all significantly influenced the demand for imports. However, Narayan and Smith (2005) argue that the estimates of Anaman and Buffong (2001) might be spurious since the data appear to have a unit root. Using the ARDL method of cointegration, they re-estimate the model and find that aggregate imports are inelastic with respect to income but elastic with respect to population and the real exchange rate. They also examine the impact of petroleum prices on Brunei's import demand and find that imports are inelastic with respect to petroleum prices. Anaman and Mahmod (2003) analyse factors affecting non-oil export supply from Brunei. Using the ARDL method of cointegration, they identify four main determinants of non-oil export supply namely: real wages, the level of oil exports[10], government export promotion policy and trend factors, such as improvement in the infrastructure.

All of this research is at the aggregate level. There has been no attempt to analyse Brunei's trade at a disaggregated level nor has there been an attempt to look at the demand side of exports. The lack of a more detailed empirical analysis of Brunei's trade means a serious knowledge gap for academicians and policymakers.

[10] Amanan and Mahmod (2003) argue that slow growth rates of the non-oil sector can be due to strong links between the dominant oil export sector and the non-oil export sector which often services the oil sector. According to them, non-oil export firms are often diversified enterprises of oil and gas firms. During periods of high world oil prices, there may be a decline in the production of non-oil export goods due to the less need to generate foreign exchange through this sector.

The main objective of this chapter is to attempt to answer whether or not the diversification policy has had any effects on the structure of the non-oil trade. We have taken the year 1989 as the year when the policy was officially embarked on (i.e. the year when the Ministry was formed). During this time, the government, through the ministry, began to introduce a number of production and export incentives as a strategy to diversify the economy. Import-substitution activities were encouraged. We also include the year 1996 in our study which was the year of the establishment of the Brunei Industrial Development Agency. The same year was also used in Anaman and Mahnod (2003) study on non-oil export determinants as their proxy for export promotion policy.

Based on the available data, there are 12 types of non-oil products that Brunei is exporting that have a value of more than B$10,000 in 2003. We then apply our export and import analysis on each of these products. Using the SITC 2-digit code (revision 3), these products are:

- 03: Fish, crustaceans and molluscs;
- 07: Coffee, tea, cocoa and spices;
- 21: Hideskins and furskins;
- 27: Crude fertilizers and crude minerals;
- 28: Metalliferous ores;
- 62: Rubber manufactures;
- 65: Textile yarn, fabrics and made-up articles;
- 66: Non-metallic mineral manufactures;
- 67: Iron and steel;

- 69: Manufactures of metals;
- 84: Articles of apparel and clothing; and
- 87: Professional, scientific and controlling apparatus.

As this is the first ever attempt to analyse trade at the disaggregate level, we will also investigate the responsiveness of each of the product to price and income changes. Thus, we will derive the price and income elasticities for all of the product groups.

The remaining sections of the chapter are as follows. Section two shows the structure of trade and the trade shares of each of the non-oil products. Section three presents the models of export and import demand functions, and describes the methodology used in the empirical analysis. Section four gives a brief explanation of the data used. Sections five and six discuss the empirical results. Section seven concludes.

3.2 Trade Composition

Brunei's total exports can be divided distinctively into the oil and gas exports (hereafter referred to as oil exports) and non-oil and gas exports (hereafter referred to as non-oil exports). There is, however, a huge difference in terms of their shares in total exports. Table 3.1 shows that the value and share of oil exports far exceeds non-oil exports. We note that the huge share continues even after the diversification policy was put into effect (i.e. 1989 and 1996). However, we can see some positive developments over the later years. Prior 1989, the non-oil exports share averaged

around 1.7 percent. Between 1989 and 1996, the share rose to about an average of 4.3 percent. In the later years, the share has risen steadily and reaches 12.3 percent in 2003. Whether or not this increase is the result of the diversification policy is what we intend to find out in this chapter.

Table 3.1

The Values and Shares of Oil and Gas Exports and Non-Oil Exports, 1980-2003 (US$ Million)

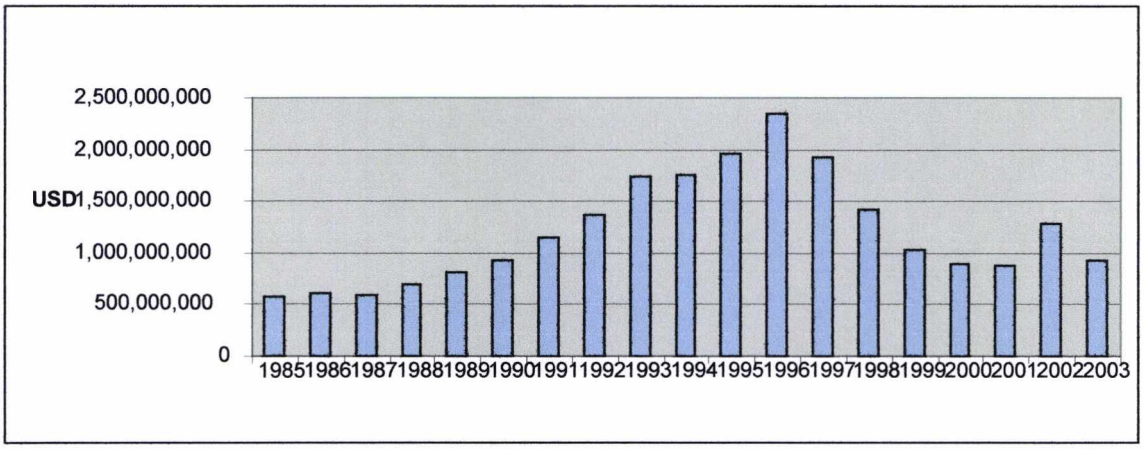
Year	Oil and Gas Exports		Non-Oil Exports	
	Values	Share (%)	Values	Share (%)
1980	4,007.24	98.60	56.99	1.40
1981	3,272.79	98.89	36.73	1.11
1982	3,268.25	99.04	31.74	0.96
1983	3,234.40	98.91	35.50	1.09
1984	3,118.37	98.76	39.11	1.24
1985	3,056.15	98.50	46.49	1.50
1986	2,652.92	97.14	78.03	2.86
1987	2,460.08	97.53	62.21	2.47
1988	2,284.20	97.54	57.64	2.46
1989	2,223.45	96.94	70.07	3.06
1990	2,232.69	96.53	80.23	3.47
1991	2,642.61	96.74	89.18	3.26
1992	2,108.68	95.67	95.51	4.33
1993	1,919.50	96.32	73.37	3.68
1994	1,791.12	94.05	113.27	5.95
1995	1,701.84	94.44	100.12	5.56
1996	1,883.87	94.76	104.18	5.24
1997	2,007.79	91.11	195.90	8.89
1998	2,141.66	88.58	276.23	11.42
1999	2,422.26	88.81	305.33	11.19
2000	3,842.47	94.67	216.19	5.33
2001	3,355.92	89.34	400.31	10.66
2002	3,364.25	88.03	457.49	11.97
2003	3,633.22	87.67	511.13	12.33

Sources: Brunei Darussalam Statistical Year Book, various issues.
Notes: Since Brunei does not produce export price index, we have used the GDP deflator to calculate the real values and the year 2000 is the base year.

Meanwhile, Brunei is heavily dependent on imports to meet its consumption and production needs (Duraman and Hashim, 1998). The high import dependence can be attributed to a number of factors, one of which is the lack of diversification of domestic production. This is mostly the result of being a small country which has limitations in terms of resources and capabilities (Armstrong and Read, 1998 and 2003; Commonwealth/World Bank, 2002). Even if Brunei succeeds in diversifying its export base, the need for imports will continue to increase especially for intermediate and capital goods. Figure 3.3 shows the value of imports over the years.

Figure3.3

Total Imports



Source: United Nation's COMTRADE

Imports reached their highest level in 1996, which according to Lawrey (1997) was largely due to the construction of infrastructure associated with the push for diversification. This, however, was immediately followed by a sharp decline in imports through 1997 until 1999 which then stayed constant at around US$1 billion in the remaining period. Our analysis will find out whether the reduction in imports is explained by the diversification policy.

The analysis of this chapter will be centred on the performance of Brunei's main non-oil exports and their equivalent imports. These are the twelve types of products mentioned in the last section. We first look at their shares in Brunei's total non-oil exports from 1985 until 2003 followed by their import shares.

Table 3.2 shows some interesting share structures of the different exports. The most interesting observation is the number of downward jumps in the shares of some of these products which incidentally occur before and after the official diversification policy was embarked on 1989. For example, 'Fish, Crustacean and Molluscs', 'Coffee, Tea, Cocoa and Spices', 'Crude Fertilizers and Crude Minerals' and 'Metalliferous Ores' which had considerable share in the total domestic non-oil exports before 1989 immediately lost their importance post 1989. What we can also see is that non-oil exports have been dominated by the export of 'Apparel and Clothing'[11] in the last 15 years. The exports of primary products, however, have not been able to improve their performance, let alone becoming a significant non-oil export, despite being targeted as activities to be developed.

[11] The year 1988 saw a number of garment factories being established and began exporting textile goods (Duraman, 2003).

Table 3.2

The Shares of Each Commodity in Total Non-Oil Exports (Per cent)

SITC	03	07	21	27	28	62	65	66	67	69	84	87	Total
1985	9.52	3.15	0.02	15.56	11.56	0.59	0.87	1.67	19.17	2.81	11.87	9.76	87.34
1986	9.68	3.46	0.04	19.68	9.10	0.65	2.10	0.71	13.14	1.14	28.68	9.21	98.44
1987	7.90	4.77	0.26	18.68	8.99	1.05	0.74	0.99	10.65	0.35	28.76	4.79	87.91
1988	5.68	3.68	0.38	12.90	3.88	0.78	0.28	1.85	6.88	6.81	52.90	3.92	99.92
1989	0.21	0.17	0.24	10.77	1.90	0.64	0.45	0.94	7.65	7.56	61.79	5.35	97.68
1990	0.33	0.08	0.16	0.03	1.25	0.68	0.83	1.81	7.87	5.54	75.68	5.57	99.86
1991	0.17	0.04	0.19	0.01	0.44	0.36	0.39	0.89	6.16	6.56	79.44	4.18	98.84
1992	0.37	0.14	0.30	0.02	0.37	0.85	0.88	0.37	4.68	5.99	65.18	6.79	85.93
1993	0.53	0.15	0.05	0.04	3.45	1.15	1.29	0.72	3.63	5.24	59.65	6.12	82.00
1994	0.40	0.14	0.40	0.29	8.41	2.30	2.98	1.47	6.65	5.10	55.55	5.68	89.36
1995	0.11	0.09	0.33	0.55	4.52	3.17	3.40	1.04	6.98	4.98	59.98	4.88	90.03
1996	0.03	0.03	0.08	0.16	1.28	0.90	1.24	0.90	8.56	5.67	65.76	3.89	88.51
1997	0.02	0.01	0.03	0.06	0.41	0.32	0.62	0.66	7.91	5.88	69.47	1.76	87.14
1998	0.09	0.01	0.02	0.07	0.62	0.41	0.42	0.36	7.12	3.77	69.76	1.47	84.10
1999	0.01	0.00	0.01	0.03	0.22	0.15	0.21	0.16	5.19	4.65	69.39	0.67	80.71
2000	0.04	0.00	0.02	0.03	0.23	0.16	0.22	0.11	5.11	6.76	67.43	0.70	80.82
2001	0.14	0.08	0.08	0.11	0.16	0.18	1.14	0.18	1.77	5.97	69.98	0.60	80.38
2002	0.10	0.05	0.11	0.04	0.17	0.10	0.55	0.13	1.49	5.01	80.18	0.78	88.75
2003	0.13	0.06	0.16	0.09	0.32	0.31	0.59	0.20	2.19	6.28	85.12	0.89	96.36

Sources: Brunei Darussalam Trade Statistics Year book, various issues; and the Department of Economic Planning and Development (unpublished data).

Notes The description of each SITC are the following:
03: Fish, crustaceans and molluscs; 07: Coffee, tea, cocoa and spices; 21: Hideskins and furskins; 27: Crude fertilizers and crude minerals; 28: Metalliferous ores; 62: Rubber manufactures; 65: Textile yarn, fabrics and made-up articles; 66: Non-metallic mineral manufactures; 67: Iron and steel; 69: Manufactures of metals; 84: Articles of apparel and clothing; and 87: Professional, scientific and controlling apparatus.

Meanwhile, Table 3.3 shows that 'non-metallic mineral manufactures (SITC 66)', 'iron and steel (SITC 67)' and 'manufactures of metals (SITC 69)' appear to have higher shares than the other products. The shares of each of the products also appear to be stable throughout the period.

Table 3.3

The Shares of Each Commodity in Total Imports (Per cent)

SITC	03	07	21	27	28	62	65	66	67	69	84	87	Total
1985	0.95	0.74	0.00	0.79	0.14	0.80	1.46	4.04	6.73	5.75	1.08	3.16	25.63
1986	1.13	0.81	0.00	0.79	0.06	0.70	1.43	5.31	4.76	5.97	1.23	1.83	24.03
1987	1.20	1.05	0.00	0.61	0.02	0.88	1.70	4.41	8.57	5.32	1.46	1.96	27.17
1988	1.32	0.81	0.00	0.65	0.02	0.80	2.25	4.68	6.79	6.58	1.19	1.62	26.70
1989	1.21	0.79	0.00	0.58	0.08	0.73	2.07	4.44	9.07	6.82	1.19	2.09	29.06
1990	1.17	0.74	0.00	0.76	0.06	0.66	2.33	6.82	7.19	7.34	1.26	2.00	30.34
1991	1.05	0.73	0.01	0.65	0.05	0.64	2.52	5.93	6.43	9.34	1.58	4.54	33.47
1992	0.91	0.57	0.00	1.02	0.07	0.81	2.53	4.76	5.84	6.33	1.14	0.89	24.86
1993	0.71	0.50	0.00	0.52	0.01	0.51	2.21	3.85	3.56	7.50	0.81	5.30	25.48
1994	1.74	0.74	0.00	1.69	0.01	0.59	2.25	5.07	6.62	5.37	0.94	0.83	25.85
1995	1.09	0.55	0.00	1.59	0.01	0.48	3.12	4.66	6.90	9.72	0.78	2.68	31.59
1996	0.93	0.67	0.00	2.34	0.05	0.47	2.88	3.96	5.53	6.26	0.93	1.60	25.64
1997	1.12	1.05	0.00	2.63	0.12	0.64	3.92	5.67	5.00	6.99	1.44	1.13	29.71
1998	1.07	1.04	0.00	1.75	0.06	0.75	5.57	4.16	5.33	9.39	1.52	1.51	32.16
1999	1.52	1.45	0.00	1.04	0.13	0.95	8.54	4.38	4.13	6.91	1.63	1.79	32.48
2000	1.50	1.29	0.00	0.89	0.10	0.96	14.58	4.20	4.86	7.31	2.16	1.47	39.32
2001	1.19	0.85	0.00	0.60	0.04	0.78	13.32	2.77	4.93	4.96	2.38	0.79	32.60
2002	0.83	0.65	0.00	0.59	0.01	0.62	8.40	2.79	5.04	4.29	2.02	1.20	26.43
2003	0.88	0.82	0.00	0.64	0.01	0.79	8.91	2.41	3.93	6.48	2.44	1.06	28.37

Sources: Brunei Darussalam Trade Statistics Year book, various issues; and the Department of Economic Planning and Development (unpublished data).

Notes The description of each SITC are the following:
03: Fish, crustaceans and molluscs; 07: Coffee, tea, cocoa and spices; 21: Hideskins and furskins; 27: Crude fertilizers and crude minerals; 28: Metalliferous ores; 62: Rubber manufactures; 65: Textile yarn, fabrics and made-up articles; 66: Non-metallic mineral manufactures; 67: Iron and steel; 69: Manufactures of metals; 84: Articles of apparel and clothing; and 87: Professional, scientific and controlling apparatus.

3.3 The Model and Econometric Techniques

3.3.1 The Model

In this section, we estimate the domestic export and import demand functions of each of the group commodity we identified earlier and find out whether or not the diversification policy introduced in 1989 and in 1996 have had any noticeable impact on the trade structure. We are also interested in finding out how elastic imports and exports are to the exchange rate and to domestic and foreign income.

We adopt conventional (constant elasticity) export and import demand functions, as used, for example, by Thirlwall (2003). Exports are assumed to be a function of price competitiveness measured by the real exchange rate[12]; and foreign income[13] which can be expressed as:

$$X_t = A\left(\frac{P_f E}{P_d}\right)_t^{\alpha_1} Z_t^{\alpha_2} \qquad (3.1)$$

where A is a constant, P_d is domestic price, P_f is foreign price of goods that compete with exports, E is the nominal exchange rate, Z is foreign income, and α_1 and α_2 are price and income elasticities respectively, which are both expected to be positive.

Imports are also a function of price competitiveness measured by the real exchange rate and domestic income which is expressed as:

[12] The real exchange rate (RER) is measured as the nominal exchange rate (quantity of Brunei dollars per one US dollar) multiplied by the ratio of foreign to domestic price. A rise in RER implies a depreciation of the Brunei dollar.

[13] Foreign income is the weighted average income of Brunei's main trading partners, weighted by their shares of Brunei's exports.

$$M_t = B\left(\frac{P_f E}{P_d}\right)_t^{\beta_1} Y_t^{\beta_2} \qquad (3.2)$$

where B is a constant, Y is domestic income and β_1 and β_2 denote the price and income elasticities, respectively. The price elasticity is expected to be negative while the income elasticity is positive. The other variables are the same as in equation (3.1). The term in the brackets can also be defined as the real exchange rate (RER).

For estimating purposes, we transform equations (3.1) and (3.2) to log-linear forms:

$$Ln\ X_t = Ln\ A_t + \alpha_1(Ln\ P_{ft} + Ln\ E_t - Ln\ P_{dt}) + \alpha_2(Ln\ Z_t) + u_t \quad (3.3)$$

and

$$Ln\ M_t = Ln\ B_t + \beta_1(Ln\ P_{ft} + Ln\ E_t - Ln\ P_{dt}) + \beta_2(Ln\ Y_t) + e_t \qquad (3.4)$$

where u_t and e_t are the error terms.

Equations (3.3) and (3.4) can then be extended to include two diversification policy indicators defined as shift dummy variables. Each one takes the value of zero prior to diversification and one afterwards. The two years considered are 1989, the year when the policy was put into effect i.e. the establishment of the ministry and 1996, the year when the Industrial Development Board was set up. The extended export and import demand functions to be estimated can now be expressed as:

$$Ln\ X_t = Ln\ A_t + \alpha_1 LnRER_t + \alpha_2 Ln\ Z_t + \alpha_3 D89_t + \alpha_4 D96_t + u_t \qquad (3.5)$$

$$Ln\ M_t = Ln\ B_t + \beta_1 LnRER_t + \beta_2 Ln\ Y + \beta_3 D89_t + \beta_4 D96_t + e_t \qquad (3.6)$$

where *D89* and *D96* are the shift dummy variables, while the rest of the variables are as defined earlier.

3.3.2 ARDL Cointegration Method

One possible problem involving the regression of time series data is that the results may be spurious if the variables are non-stationary. But a non-stationary variable may still have a long run relationship with other non-stationary variables if the linear combination of these variables is stationary. This is known as cointegration.

There are a number of methods available for conducting the cointegration test including Engle-Granger's (1987) residual based test and the Johansen's multivariate test (Johansen and Juselius, 1990). However these methods require that the variables in the system be of the same order of integration.

We adopt the autoregressive distributive lag (ARDL) method of cointegration developed by Pesaran and Pesaran (1997), Pesaran and Shin (1999) and Pesaran *et al.* (2001). This approach has numerous advantages, among them are the fact that it can be applied irrespective of whether the variables are I(0) or I(1), thus relieving users from pre-testing the variables for unit roots. It also allows for a dynamic error correction model to be derived, integrating the short-run dynamics with the long-run equilibrium without losing long-run information; in other words, the long and short-run parameters of a model are estimated simultaneously. The general framework for the ARDL (p,q) model (Pesaran and Shin, 1995) is:

$$y_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \phi_i y_{t-1} + \beta' x_t + \sum_{i=0}^{q-1} \beta_i^{*'} \Delta x_{t-1} + u_t \quad (3.7)$$

$$\Delta x_t = P_1 \Delta x_{t-1} + P_2 \Delta x_{t-2} + \ldots + P_s \Delta x_{t-s} + \varepsilon_t \quad (3.8)$$

Where x_t are the k-dimensional variables that are not cointegrated among themselves, u_t and ϵ_t are serially uncorrelated disturbances with zero means and constant variance-covariances, and P_i are k x k coefficient matrices such that the vector autoregressive process in Δx_t is stable.

Pesaran and Shin (1995) has shown that when u_t and ϵ_t are uncorrelated then the OLS estimators of the short-run parameters are $\sqrt{T}$ consistent, and the covariance matrix of these estimators is asymptotically singular, so that the short-run coefficient estimators are asymptotically perfectly collinear with the estimators of the coeffcients of the lagged dependent variable, and that the OLS estimators of the long-run coeffcients converge to their true values at a fast rate. In the case when u_t and ϵ_t are correlated, the ARDL specification can be augmented with an adequate number of lagged changes in the regressors.

In accordance to the above framework, our ARDL model of equations (3.5) and (3.6) are given as follows:

$$\Delta LnX_t = a_0 + \sum_{i=1}^{p} \lambda_{1i} \Delta LnX_{t-1} + \sum_{i=0}^{p} \lambda_{2i} \Delta LnRER_{t-1} + \sum_{i=0}^{p} \lambda_{3i} \Delta LnZ_{t-1} + \lambda_4 LnX_{t-1} + \lambda_5 LnRER_{t-1} + \lambda_6 LnZ_{t-1} + \lambda_7 D89 + \lambda_8 D96 + u_t \quad (3.9)$$

$$\Delta LnM_t = b_0 + \sum_{i=1}^{p} \beta_{1i} \Delta LnM_{t-1} + \sum_{i=0}^{p} \beta_{2i} \Delta LnRER_{t-1} + \sum_{i=0}^{p} \beta_{3i} \Delta LnY_{t-1} + \beta_4 LnM_{t-1} + \beta_5 LnRER_{t-1} + \beta_6 LnY_{t-1} + \beta_7 D89 + \beta_8 D96 + e_t \quad (3.10)$$

The ARDL method for testing of a long-run relationship amongst the variables involves two steps, starting with the bound test for the null hypothesis of no cointegration. The F-test used has a non-standard distribution. Thus, two sets of critical values, one assuming that all variables are I(0) and the other assuming they are all I(1), are computed by Pesaran and Pesaran (1996). If the test statistic exceeds the upper critical value, the null hypothesis can be rejected. If it falls below the lower critical value, it implies no cointegration and finally, if it falls within the bounds, the result is inconclusive. Based on a correctly specified ARDL model, selected by test criteria such as the Schwartz-Bayesian Criterion (SBC) and Akaike's Information Criteria (AIC), a long-run relationship can be established.

Once the long-run relationship is established, then the long-run and error correction estimates of the ARDL can be obtained. From equation (3.9), λ_1, λ_2, and λ_3 represent the short-run dynamics of the export equation while β_1, β_2 and β_3 from equation (3.10) are the import equation. Meanwhile, λ_4, λ_5, λ_5, β_4, β_5 and β_6 represent the long-run coefficients. A general error correction representation of equations (3.19) and (3.10) can be formulated as follows:

$$\Delta LnX_t = a_0 + \sum_{i=1}^{p} \lambda_{1i} \Delta LnX_{t-1} + \sum_{i=0}^{p} \lambda_{2i} \Delta LnRER_{t-1} + \sum_{i=0}^{p} \lambda_{3i} \Delta LnZ_{t-1} + \tau EC1_{t-1} + \omega_t \quad (3.11)$$

$$\Delta LnM_t = b_0 + \sum_{i=1}^{p} \beta_{1i} \Delta LnM_{t-1} + \sum_{i=0}^{p} \beta_{2i} \Delta LnRER_{t-1} + \sum_{i=0}^{p} \beta_{3i} \Delta LnY_{t-1} + \mu EC2_{t-1} + \upsilon_t \quad (3.12)$$

Where τ and μ are the speed of adjustment parameters and EC1 and EC2 are the residuals that are obtained from the estimated cointegration models of equation (3.9) and (3.10), respectively.

3.4 The Data

The biggest challenge for this chapter is the lack of availability of published data. To overcome the problem, we mainly use two data sources. For the trade data, we use the United Nations Commodity Trade Statistics Database (COMTRADE) available from their website; and for data which are unavailable from COMTRADE, we use data from the Brunei External Trade Statistics from the Department of Economic Planning and Development, Brunei (DEPD). The available data are up to 2003.

Brunei does not publish export and import price indices hence making it difficult to convert the current values into real values for the disaggregated exports and imports. In 2006, DEPD published back series beginning from 1980 of Brunei's Implicit Price Deflators for a number of product categories which we have used as a proxy to deflate our nominal trade values.

For other data, we use sources from the various issues of the Brunei Statistical Yearbook and sometimes resort to unpublished data in cases when we find inconsistencies in the published data. The definitions and the constructions of the variables used in this chapter are as follows:

i) For the foreign income variable, we construct a trade-weighted average of income of Brunei's main non-oil exports' customers, namely Malaysia, Singapore and the United States. The weights are their shares of Brunei's exports

ii) The real exchange rate (RER) is measured as the nominal exchange rate (quantity of Brunei dollars per US dollar) multiplied by the ratio of foreign to domestic prices. A rise in RER implies a depreciation of the Brunei dollar. We use the Consumer Price Index (CPI) as our domestic price and construct the trade-weighted average of Brunei's main trading partners' foreign price indices as our foreign price. Our data sources come from the various issues of Brunei Statistical Yearbook and the IMF Statistical Yearbook (various issues).

iii) We use real GDP for the income variable.

Faced with a restricted availability of data, our data span for this chapter is selected as 1980-2003.

3.5 Analysis of Exports

The advantage of using the ARDL method of cointegration is that it can be applied irrespective of whether the variables are I(0) or I(1), thus relieving users from pre-testing the variables for unit roots. We ascertain the existence of a long-run relationship among the variables in our equations by performing the bound F-test. The F-statistic is used to examine the significance of the lagged levels of the variables in the error correction form of the underlying ARDL model. Given that we are using annual data and constrained with a small sample size, we only experimented up to 1 lag on the first difference of each variable. The computed F-statistic is then compared with the bounded critical values in Pesaran *et al* (2001). If the computed F-statistic is higher than the upper bound critical value, then we may

reject the null hypothesis of no long-run relationship. Table 3.8 gives the computed F-statistics for each of our export equations along with the critical values at the bottom of the table.

Table 3.4: F-statistics for Non-Oil Exports

Export Equation	F-statistic
Non-Oil Exports	4.1671*
03: Fish, crustaceans and molluscs;	4.4723*
07: Coffee, tea, cocoa and spices;	4.6644*
21: Hideskins and furskins;	9.7215**
27: Crude fertilizers and crude minerals;	2.5632
28: Metalliferous ores;	4.5803*
62: Rubber manufactures;	4.3493*
65: Textile yarn, fabrics and made-up articles;	6.4874**
66: Non-metallic mineral manufactures;	3.0714
67: Iron and steel;	2.6992
69: Manufactures of metals;	1.7642
84: Articles of apparel and clothing; and	4.5733*
87: Professional, scientific and controlling apparatus	8.3827**

Notes: The critical values with an unrestricted intercept and no trend at 5 percent significance level are 3.793-4.855 and at 10 percent significance level are 3.182-4.126, respectively. The asterisk (**) denotes rejection of the null hypothesis of no cointegration at 5 percent level and (*) at 10 percent level.

The results show that the null hypothesis of no long-run relation can be rejected in nine out of thirteen export equations including total non-oil exports. Given the existence of a long-run relationship, we can proceed with the second stage of ARDL estimation with a maximum order of lag set to 1. We then use the lag selection criteria of maximizing Akaike Information Criterion (AIC) or Schwartz Bayesian Criterion (SCB) to find the optimal length of the level variables of the long-run coefficients. According to Pesaran (1997), the AIC and SBC perform relatively well in small samples. We report the estimates of the error correction (ECM) representations of the short-run estimates in Table 3.5 and the long-run estimates in Table 3.6. The results for the diagnostic tests are in Appendix Table A3.1.

Table 3.5

Error Correction Model of Disaggregated Exports

Variable Equation	Constant	RER (+)	Z (+)	D89 (+)	D96 (+)	*ECM*
Non-Oil Exports SBC ARDL (1,0,0)	11.2248 (2.9518)**	0.7026 (0.9515)	0.1272 (0.5211)	0.1016 (0.2592)	1.3245 (3.842)**	*-0.6338* *(-3.501)***
03: Fish, crustaceans and molluscs AIC ARDL (1,1,1)	0.284 (5.909)**	0.533 (0.527)	0.465 (1.443)	-0.439 (-0.596)	-0.451 (-0.716)	*-0.760* *(-5.774)***
07: Coffee, tea, cocoa and spices AIC ARDL (1,1,1)	1.349 (0.148)	0.295 (0.187)	0.837 (0.159)	0.249 (0.223)	0.861 (0.981)	*-0.681* *(-2.612)***
21: Hideskins and furskins; AIC ARDL (1,0,0)	4.983 (2.229)	1.445 (2.265)**	-0.201 (-0.126)	-0.804 (-0.955)	-0.305 (-0.485)	*-0.437* *(-2.497)***
28: Metalliferous ores AIC ARDL (1,1,0)	2.896 (2.454)**	2.014 (1.548)	0.452 (1.096)	-0.453 (-0.681)	-0.775 (-1.412)	*-0.651* *(-2.752)***
62: Rubber manufactures AIC ARDL (1,0.0)	9.795 (2.074)*	0.520 (3.037)**	0.486 (0.202)	-0.669 (-1.193)	0.214 (0.494)	*-0.535* *(3.471)***
65: Textile yarn, fabrics and made-up articles AIC ARDL (1,0.0)	10.943 (3.401)**	0.363 (0.481)	0.498 (2.423)**	0.407 (0.765)	1.105 (2.000)*	*-0.593* *(-2.978)***
84: Articles of apparel and clothing; AIC ARDL (1,1,1)	6.212 (2.283)**	1.166 (0.579)	2.282 (3.813)**	1.242 (0.667)	0.692 (0.602)	*-0.575* *(-3.702)***
87: Professional, scientific and controlling apparatus *AIC ARDL (1,1,0)*	*13.842* *(4.641)***	*0.684* *(1.124)*	*0.395* *(1.953)**	*0.765* *(1.543)*	*0.249* *(0.654)*	-0.372 (-5.301)**

Notes: Values in parentheses refer to the t-statistics. The asterisk (**) denotes the coefficient is statistically significant at 5 percent, and (*) denotes significance level of 10 percent.

Table 3.6

Long-run Estimates of Disaggregated Exports

Variable Equation	Constant	RER (+)	Z (+)	D89	D96
Non-Oil Exports SBC ARDL (1,0,0)	17.709 (3.3691)**	1.1085 (1.1643)	0.2007 (0.5190)	0.1603 (0.26308)	2.0896 (3.871)**
03: Fish, crustaceans and molluscs AIC ARDL (1,1,1)	0.224 (4.658)**	3.971 (8.722)**	0.772 (2.610)**	-0.346 (-0.616)	-0.355 (-0.761)
07: Coffee, tea, cocoa and spices AIC ARDL (1,1,1)	1.981 (0.148)	3.726 (2.747)**	0.599 (2.052)*	0.365 (0.222)	0.126 (0.967)
21: Hideskins and furskins; AIC ARDL (1,0,0)	11.361 (2.067)*	3.294 (2.017)*	-0.459 (-0.126)	-1.841 (-0.867)	-0.698 (-0505)
28: Metalliferous ores and Scrap Metal AIC ARDL (1,1,0)	4.452 (2.493)**	1.914 (0.814)	0.694 (1.001)	-0.697 (-0.621)	-1.191 (-1.138)
62: Rubber manufactures AIC ARDL (1,0.0)	10.673 (6.955)**	0.797 (2.041)*	0.226 (2.175)**	0.668 (1.192)	0.241 (0.593)
65: Textile yarn, fabrics and made-up articles AIC ARDL (1,0.0)	11.843 (1.894)*	0.363 (0.481)	0.841 (2.798)**	0.507 (0.604)	1.306 (2.000)*
84: Articles of apparel and clothing; AIC ARDL (1,1,1)	7.909 (2.181)*	0.848 (1.129)	2.404 (3.698)**	0.788 (0.739)	-0.439 (-0.567)
87: Professional, scientific and controlling apparatus AIC ARDL (1,1,0)	15.369 (9.799)**	0.498 (1.174)	0.119 (1.231)	0.806 (1.617)	0.279 (0.747)

Notes: Values in parentheses refer to the t-statistics. The asterisk (**) denotes the coefficient is statistically significant at 5 percent, and (*) denotes significance level of 10 percent.

Our results show that the diversification policy introduced in 1989 does not appear to have had any effect on the non-oil exports, either in the short-run or the long-run[14]. However, we find some evidence of positive effect of the second policy, represented by the dummy variable, D96, on total non-oil exports and also on the export of 'Textile Yarn, Fabrics and Made-up Articles (SITC 65)'.

[14] We have tried using the years 1990, 1991 and 1992 as our dummy variables respectively in order to look for any lag effects but still cannot find significant results.

We also find that a few of the exports are price elastic in the long-run. This shows that the exchange rate could play a role in increasing non-oil exports. At present, the Brunei dollar is pegged to the Singapore dollar. As Singapore's economy is larger than Brunei, it therefore has more influence on the exchange rate. And since both economies are different from each other, actions taken by the Monetary Authority of Singapore that may be more appropriate for Singapore may have an opposite effect on Brunei.

Meanwhile, foreign income also appears to be statistically significant for a number of exports. 'Articles of Apparel and Clothing Accessories (SITC 84)' which has become an important non-oil export in the recent years is income elastic implying its potential to be developed. It is, however, interesting that the exchange rate doesn't appear to be an important determinant of the demand for this product.

3.6 Analysis of Imports

We now turn to the estimations of imports at the disaggregated level. We start off by computing the F-statistic for each of the import equations to test for the existence of long-run relations. The results are given in Table 3.11 and show that the null hypothesis of no cointegration can be rejected in nine of the equations, including total imports.

Table 3.7

F-statistics for Disaggregated Imports

Equation	F-statistic
Total Import	6.404**
03: Fish, crustaceans and molluscs;	2.512
07: Coffee, tea, cocoa and spices;	4.293*
21: Hideskins and furskins;	1.982
27: Crude fertilizers and crude minerals;	1.364
28: Metalliferous ores and Scrap Metal	4.771*
62: Rubber manufactures;	1.198
65: Textile yarn, fabrics and made-up articles;	4.939**
66: Non-metallic mineral manufactures;	4.617*
67: Iron and steel;	5.532**
69: Manufactures of metals;	4.542*
84: Articles of apparel and clothing;	4.341*
87: Professional, scientific and controlling apparatus	4.654*

Notes: The critical values with an unrestricted intercept and no trend at 5 percent significance level are 3.793-4.855 and at 10 percent significance level are 3.182-4.126, respectively. The asterisk (*) denotes rejection of the null hypothesis of no cointegration.

We proceed to use the ARDL method of cointegration for those equations that have an established long-run relationship among the variables. We report the error correction (ECM) representation for each import commodity in Table 3.8 and the corresponding long-run estimates in Table 3.9. The results for the diagnostic tests are in Appendix Table A3.2

The short-run results show that the first shift dummy variable, D89, has a negative sign in the import of 'Textile Yarn, Fabrics and Made-up Articles (SITC 65)' but has a positive sign in 'Articles of Apparel and Clothing (SITC 84)', while the second shift dummy variable, D96, appears to be a significant explanatory variable for only two of the imports namely 'Metalliferous Ores (SITC 28)' (positive sign) and 'Manufactures of Metals (SITC 69)' (negative sign).

Table 3.8

Error Correction Model for Disaggregated Import

Variable Equation	Constant	RER (-)	Z (+)	D89	D96	ECM
Total Import SBC ARDL (1,0,0)	12.975 (3.316)**	-0.988 (-7.63)**	0.659 (0.267)	0.159 (1.282)	-0.220 (-0.873)	-0.472 (-2.821)**
07: Coffee, tea, cocoa and spices AIC ARDL (1,0,0)	14.591 (3.123)**	-1.259 (-4.45)**	0.773 (1.008)	-0.238 (-0.792)	0.339 (1.163)	-0.245 (-3.131)**
28: Metalliferous Ores and Scrap Metal AIC ARDL (1,0,0)	9.989 (3.930)**	-2.765 (-2.63)**	-14.483 (-3.487)**	1.424 (4.631)**	1.467 (4.994)**	-0.298 (-3.770)**
65: Textile yarn, fabrics and made-up articles AIC ARDL (1,0,0)	10.188 (1.453)	-0.401 (-2.71)**	1.454 (1.408)	-0.303 (-2.034)*	-0.999 (-0.747)	-0.133 (-5.136)**
66: Non-metallic mineral manufactures; AIC ARDL (1,0,1)	4.167 (2.164)**	-1.642 (-2.86)**	0.505 (0.217)	0.367 (1.494)	0.201 (0.753)	-0.689 (-3.052)**
67: Iron and steel; AIC ARDL (1,0,0)	15.084 (0.867)	-1.165 (-2.89)**	0.203 (0.101)	0.236 (0.947)	-0.186 (-0.710)	-0.712 (-3.624)**
69: Manufactures of metals; AIC ARDL (1,1,1)	10.818 (0.455)	-1.021 (2.68)**	2.276 (0.971)	0.607 (0.261)	-0.529 (-2.154)*	-0.487 (-3.786)**
84: Articles of apparel and clothing; AIC ARDL(1,0,0)	2.195 (2.466)**	-0.746 (-4.47)**	0.962 (1.998)*	0.137 (2.033)**	0.131 (1.346)	-0.542 (-4.876)**
87: Professional, scientific and controlling apparatus AIC ARDL (1,0,1)	9.750 (2.952)**	-3.442 (-4.57)**	1.998 (1.910)*	0.767 (1.799)*	0.175 (0.375)	-0.628 (-7.731)**

Notes: Values in parentheses refer to the t-statistics. The asterisk (**) denotes the coefficient is statistically significant at 5 percent, and (*) denotes significance level of 10 percent.

We also find that in the short-run, domestic income (Z) does not seem to be an important determinant in many of the import equations with the exception of 'Apparel and Clothing Accessories (SITC 84)' and 'Professional, Scientific and Controlling Apparatus (SITC 87)' which have the expected positive sign, and has a

negative sign for 'Metalliferous Ores (SITC 28)'. The coefficients of the error correction (ECM) variable are statistically significant with the expected sign in all of the equations. We now turn to the long-run results.

Table 3.9

Long-run Estimates for Disaggregated Imports

Variable Equation	Constant	RER (-)	Z (+)	D89	D96
Total Import SBC ARDL (1,0,0)	14.732 (1.821)*	-1.869 (-8.889)**	0.859 (0.867)	0.182 (1.282)	-0.120 (-0.843)
07: Coffee, tea, cocoa and spices AIC ARDL (1,0,0)	24.591 (3.131)**	-1.159 (-5.385)**	0.973 (1.008)	-0.538 (-0.392)	0.369 (2.433)**
28: Metalliferous ores AIC ARDL (1,0,0)	12.989 (3.770)**	-2.582 (-2.329)**	-14.393 (-3.407)**	2.424 (4.931)**	2.467 (4.544)**
65: Textile yarn, fabrics and made-up articles AIC ARDL (1,0,0)	7.524 (2.017)*	-0.113 (-7.919)**	10.924 (8.080)**	2.278 (1.201)	0.750 (0.912)
66: Non-metallic mineral manufactures; AIC ARDL (1,0,1)	6.461 (2.777)**	-2.382 (-4.823)**	5.077 (1.902)*	0.533 (1.596)	0.292 (0.761)
67: Iron and steel; AIC ARDL (1,0,0)	11.171 (1.921)*	-1.635 (-2.530)**	0.286 (0.101)	0.331 (0.997)	-0.261 (-0.704)
69: Manufactures of metals; AIC ARDL (1,1,1)	11.818 (1.774)	-2.252 (-7.440)**	3.789 (2.015)*	0.608 (0.261)	-0.529 (-2.021)*
84: Articles of apparel and clothing; AIC ARDL(1,0,0)	3.195 (0.466)	-0.646 (-4.172)**	1.662 (1.978)*	0.237 (2.003)*	0.181 (1.546)
87: Professional, scientific and controlling apparatus AIC ARDL (1,0,1)	9.750 (2.952)**	-2.113 (-5.369)**	3.913 (1.893)*	0.471 (1.833)*	0.107 (0.378)

Notes: Values in parentheses refer to the t-statistics. The asterisk (**) denotes the coefficient is statistically significant at 5 percent, and (*) denotes significance level of 10 percent.

In the long run results, the two shift dummy variables are significant in only a few of the import equations. The first shift dummy, D89, is positively significant in 'Metalliferous Ores (SITC 28)', 'Articles of Apparel and Clothing (SITC 84)' and 'Professional, Scientific and Controlling Apparatus (SITC 87)', while the second

dummy, D96, is significant and also has a positive effect in 'Coffee, Tea, Cocoa and Spices (SITC 07)' and 'Metalliferous Ores (SITC 27)'. This positive effect of the diversification policy can be explained on the ground that whilst domestic production is being promoted, the needs for import will still be retained especially for inputs to production. Furthermore, since our data are at the 2 digit SITC level which is a broad aggregation, it could be the case that the imported goods may be those goods which are not produced domestically.

The real exchange rate variable, *RER*, appears to be the main explanatory variable in all of the import equations, while domestic income is statistically significant in six out of the nine equations.

3.7 Conclusion

We have used the ARDL method of cointegration to ascertain the effect of the diversification policies introduced in 1989 and in 1996 on the export and import of a number of products. We find no evidence that the first policy had any noticeable effect on non-oil exports. The second policy for export promotion introduced in 1996, however, had a positive effect on total non-oil exports. It also had a positive effect on the exports of 'Textile Yarn, Fabrics and Made-up Articles (SITC 65)'.

Meanwhile, the import demand analysis shows that the diversification policies appear to have had a mixture of effects on a number of imports. We also find that the real exchange rate, as opposed to income, is the most important determinant of

the demand for exports and imports. This seems to suggest that the exchange rate can be a policy tool in the diversification strategy.

APPENDICES TO CHAPTER 3

Table A3.1

Diagnostic Tests for Export Equations

Dependent variable	Serial Correlation	Functional Form	Normality	Heteroskedasticity
Non-Oil Exports	0.473	0.247	0.379	0.195
03: Fish, crustaceans and molluscs	0.705	0.123	0.647	0.105
07: Coffee, tea, cocoa and spices	0.873	0.899	0.779	0.691
21: Hideskins and furskins;	0.680	0.900	0.725	0.375
28: Metalliferous ores and Scrap Metal	0.757	0.626	0.705	0.356
62: Rubber manufactures	0.485	0.270	0.654	0.885
65: Textile yarn, fabrics and made-up articles	0.623	0.253	0.928	0.229
84: Articles of apparel and clothing;	0.542	0.101	0.737	0.521
87: Professional, scientific and controlling apparatus	0.908	0.807	0.167	0.301

Note: The figures are p-values.

Table A3.2

Diagnostic Tests for Import Equations

Dependent variable	Serial Correlation	Functional Form	Normality	Heteroskedasticity
Non-Oil Exports	0.857	0.270	0.404	0.234
07: Coffee, tea, cocoa and spices	0.503	0.805	0.726	0.188
28: Metalliferous ores	0.279	0.445	0.317	0.669
65: Textile yarn, fabrics and made-up articles	0.238	0.793	0.707	0.139
66: Non-metallic mineral manufactures;	0.270	0.130	0.392	0.558
67: Iron and steel;	0.725	0.628	0.533	0.747
69: Manufactures of metals;	0.352	0.441	0.846	0.148
84: Articles of apparel and clothing;	0.707	0.656	0.629	0.807
87: Professional, scientific and controlling apparatus	0.647	0.954	0.732	0.133

Note: The figures are p-values.

CHAPTER 4

REVEALED COMPARATIVE ADVANTAGE

4.1 Introduction

One of the strategies in diversifying the economy put forward in the National Development Plans is the development of the non-oil exports. In the light of an increasingly competitive international environment, it is useful to find out the extent to which Brunei has become specialized in its current exports. In other words, we need to investigate where Brunei's apparent comparative advantage lies. The latter term is used to describe the tendency for countries to export those commodities that they are relatively adept at producing, vis-à-vis the rest of the world (Addison-Smith, 2005).

While orthodox trade theory argues that patterns of specialization are determined by a country's natural physical and human resource endowments, it does not follow that this is the pattern of specialization that a country should produce and export in order to bring about faster growth. Comparative advantage theory is 'static' not 'dynamic'. There is evidence that countries that specialize in more productive goods, or dubbed as 'rich country products', instead of producing traditional goods based on resource availability, are likely to grow faster (see for example Rodrik, 2006, and Hausmann *et al*, 2005).

Our first task in this chapter is to get an overview of Brunei's comparative advantage of its main exports. We use Balassa's (1965) revealed comparative

advantage index and Vollrath's (1991) competitiveness indices. Secondly, we will look at the 'productivity level' associated with these commodities based on Hausmann *et al* (2005) index. We focus our study on Brunei's trade with ASEAN. This is mainly because ASEAN has become one of Brunei's main non-oil trading partners,[15] and in light of the formation of the ASEAN Free Trade Area (AFTA)[16], we are interested in looking at the effect of such a trade agreement. Therefore, this chapter will also investigate Brunei's competitiveness vis-à-vis ASEAN in the world market as well as in the ASEAN market.

The major task for this chapter, however, is the attempt to identify what other non-oil products can be developed into major exports and their relevant markets using a "decision-support model" approach developed by Cuyvers (1997 and 2004). The finding of this can be used as a direction towards which Brunei can identify the types of niche products that can be used as a strategy in diversifying the economy.

The remaining sections of the chapter are as follows. Section two will review some literature on comparative advantage. Section three describes the methodology used in the study. This is followed by the results in section four and summary and conclusion in section five.

[15] ASEAN's share of Brunei non-oil exports in the last 5 years has averaged 65 %.

[16] AFTA was established in 1992 to eliminate tariff barriers among the Southeast Asian countries with a view to integrate the ASEAN economies into a single production base and creating a regional market of 500 million people (ASEAN Secretariat, 2002). The Agreement on the Common Effective Preferential Tariff (CEPT) Scheme for the AFTA requires that tariff rates be reduced (in phased) to no more than five percent. Quantitative restrictions and other non-tariff barriers are to be eliminated. AFTA was originally scheduled to be realized by 2008, but this deadline was moved forward due to significant progress made by member countries. It became fully operational in 2003.

4.2 Literature Review

There are two prominent trade theories related to comparative advantage. The first is the original Ricardian theory which assumes that differences in comparative advantage (or the opportunity cost of producing goods) across countries, determined mainly by differences in 'natural' conditions and technology, is the reason why countries gain from trade. The second theory is the Hecksher-Ohlin theory which attributes comparative advantage to differences in factor prices across countries due to differences in relative factor endowments, while assuming technologies are the same.

To test the Hecksher-Ohlin theory, and to measure comparative advantage based on factor endowment ratios, is difficult (see Balassa, 1965, 1979.). This is because pre-trade relative prices across countries are not observable. Instead, Balassa proposes a measure of 'revealed' comparative advantage using observed trade patterns, now known as the Balassa index, or an index of Revealed Comparative Advantage (RCA). The index tries to identify whether a country has a 'revealed' comparative advantage rather than to determine the underlying sources of comparative advantage. As such, the RCA is measured by a country's share of commodity exports vis-à-vis that of the world and is defined as:

$$RCA_{ij} = (x_{ij}/X_{tj}) / (X_{iw}/X_{tw}) \qquad (4.1)$$

where:

x_{ij} represents the value of country j's exports of commodity i;

X_{tj} represents the value of country j's total exports;

X_{iw} represents the value of world exports of commodity i; and

X_{tw} represents the value of total world exports.

The first term of equation (4.1) represents the share of commodity *i* in country *j*'s total exports, while the second term represents the share of commodity *i* in total world exports. The index has a straightforward interpretation whereby a value exceeding unity implies that the country has a revealed comparative advantage in the commodity while a value less than unity implies the country has a revealed comparative disadvantage. The Balassa index has been applied in a number of studies to analyse the revealed comparative advantage of different countries. These include Hillman (1980), Maule (1996), Rodas-Martini (1998), Mahmood (2001) and Addison-Smyth (2005).

There have been many critiques of the Balassa index. Yeats (1985) argues that the numeric values of the index do not provide an ordinal ranking of a country's comparative advantage across sectors, if the underlying distributions of index values are different across countries. In other words, a country which has a higher index value does not necessarily mean that it has a 'higher' degree of RCA than a country which has a lower index value. Laursen (1998) argues that the index must be made symmetric when used in econometric analysis. As it ranges from zero to one, it is not comparable on both sides of unity. This is because any value from zero to one indicates a country does not have a comparative advantage in a given sector whereas any value from one to infinity implies comparative advantage. Vollrath (1991) has offered three alternative specifications of revealed comparative advantage. The first is called the *relative trade advantage* (RTA), which accounts for imports as well as exports, and can be defined as:

$$RTA = RXA - RMA \quad (4.2)$$

where RXA = Relative Export Advantage = $(x_{ij}/X_{nj}) / (X_{iw}/X_{nw})$ (4.2a)

RMA = Relative Import Advantage (or rather Disadvantage) =

$$(m_{ij}/M_{nj}) / (M_{iw}/M_{nw}) \quad (4.2b)$$

where:

x_{ij} represents the value of country j's exports of commodity i;

X_{nj} represents the value of country j's total exports excluding commodity i;

X_{iw} represents the value of world exports minus country j exports of commodity i;

X_{nw} represents the value of total world exports minus country j exports of all commodities excluding commodity i;

m_{ij} represents the value of country j's imports of commodity i;

M_{nj} represents the value of country j's total imports excluding commodity i;

M_{iw} represents the value of world imports minus country j imports of commodity i; and

M_{nw} represents the value of total world imports minus country j imports of all commodities excluding commodity i;

Thus:

$$RTA = [(x_{ij}/X_{nj}) / (X_{iw}/X_{nw})] - [(m_{ij}/M_{nj}) / (M_{iw}/M_{nw})] \quad (4.3)$$

The second measure is the logarithm of the relative export advantage:

$$LRXA = Ln\ (RXA) \quad (4.4)$$

The third measure is *revealed competitiveness* (RC) which is defined as:

$$RC = Ln\ (RXA) - Ln\ (RMA) \quad (4.5)$$

The advantage of expressing the latter two indices (4.4) and (4.5) in logarithmic form is that they become symmetric through the origin. Positive values of all three indices reveal a comparative advantage whereas negative values indicate comparative disadvantage. Vollrath further argues that these indices are superior because they exclude commodity i from total commodities and exclude country j from all countries, hence avoiding double counting. Another advantage, according to him is that the indices, particularly RTA and RC, are consistent with the real world phenomenon of two-way trade since they use export and import data thus embodying the relative demand and relative supply dimensions. He recognizes, however, some shortcomings of the indices. These include the sensitivity of the RC index to small values of exports or imports, and in the case when two-way trade does not occur which results in an index value of zero (the case of no exports) or value not defined (the case of no imports). The Vollrath indices have been applied in a number of studies including Fertö and Hubbard (2003), Havrila and Gunawardana (2003), Utkulu and Seymen (2004) and Evans *et al.* (2006).

The problem of using either the Balassa index or the Vollrath indices, however, lies in the fact that they make use of observed trade data (Maule, 2001; Fertö and Hubbard, 2003). Comparative advantage theory depends on pre-trade relative prices which are not observable. The determinants of the unobservable prices include resource and factor endowments, technology level and demand. The differences in these determinants across countries that actually lead to the differences in relative prices, and therefore the structure of trade, should reflect countries' patterns of comparative advantage. It is, however, argued that actual

trade patterns may not reflect true comparative advantage. This is because in the real world, observed trade patterns are often distorted by government policies and interventions such as tariffs, quotas, export incentives, high transport costs and so on. This means the calculated revealed comparative advantage might be misleading and obscure the 'real' comparative advantage.

Recent developments in trade theory (see for example Hausmann and Rodrik, 2003; Rodrik, 2006; Hausmann *et al.*, 2005) argue that a country's 'fundamentals' such as its natural resources, labour and the physical and human capital endowments, cannot be the sole determinant of its pattern of specialization if a faster pace of growth and development is the objective.

Hausmann *et al* (2005) show that countries that specialize in the types of goods that rich countries export are likely to grow faster than countries that specialize in other goods. According to them, rich countries tend to produce certain 'rich-country' goods while countries that tend to produce 'poor-country' goods remain poor. Countries become what they produce. By looking at China, Rodrik (2006) shows that the phenomenal performance of its economy is due to the fact that it is producing and exporting a wide range of highly sophisticated products relative to its stage of development or per capita income. In other words, China has somehow latched on to advanced, high-productivity products that one would not normally expect a poor, labour abundant country to produce. How can this be explained?

Central to this is Hausmann and Rodrik's (2003) 'self discovery' model. Entrepreneurs or new investors who are contemplating to produce new non-

traditional products often face uncertainty about the costs of operation. The risks that arise from the uncertainty are borne disproportionately by the early entrants. If they are successful, others will learn and imitate quickly, conferring externalities. If, however, they fail, the costs are private. Thus, in their model, the productivity level of a good, θ, which represents the units of output generated by an investment, is not known *a priori.* However, once the θ of a product is discovered, it becomes common knowledge, and new entrants are free to emulate the same good without incurring any 'discovery cost'. Each time an investor wants to invest in a new product, he will compare his θ with θ^{max}, the most productive good that has been discovered, because emulating a product will reduce profit. Hence, the expected profit, $E(\pi)$, of an investment will depend on the expected productivity. The expected productivity, $E(\theta^{max})$ in turn depends on 'skills' (h) and the number of investors engaged in cost discovery (m). Mathematically these can be written as:

$$E(\theta^{\max}) = \frac{hm}{m+1} \tag{4.6}$$

$$E(\pi) = \frac{1}{2} ph\left[1 + \left(\frac{\alpha m}{m+1}\right)^2\right] \tag{4.7}$$

This implies that market forces alone, particularly in the developing countries, would not be able to induce enough 'self discovery' that can allow a country to diversify its production into high-productivity goods. Hence, there is a need for the government to play a role in fostering this kind of activity and at the same time should also be able to push out existing unproductive sectors, a sort of 'carrot' and 'stick' provider. In other words, the government should give appropriate promotions (carrots) to the activities that can increase the pay-off of new

investments and innovations, while disciplinary actions (sticks) are used against the non-performing firms or sectors[17]. What should be expected, however, is that at the end of the day the investors or entrepreneurs who come into the market aided, would ultimately be able to stand on their own hence inducing more and more 'self discovery'. Going back to China's story, Rodrik (2006) believes that the phenomenal performance of China is due to the success of a number of cost discoveries[18] and it also indicates that it is not how much you export , but the quality of what you export that matters.

Hausmann *et al* (2005) construct a quantitative index that measures the 'productivity level' associated with a country's export basket, EXPY, which is a proxy for θ^{max}. Hence, countries that export higher θ^{max} would grow faster precisely because they export these goods.

This index is calculated in two steps. First they compute the weighted average of the per capita income of countries exporting the product, where the weights are the revealed comparative advantage of each country for the product (normalized so that the weights sum up to 1). This gives the income level of that commodity, called PRODY, and mathematically is defined as:

$$PRODY_k = \sum_j \frac{(x_{jk}/X_j)}{\sum_j (x_{jk}/X_j)} Y_j \qquad (4.8)$$

Where k = product type;

j = country;

[17] Hausmann and Rodrik (2003) discuss the various types of government interventions which have various merits and de-merits in promoting innovations and creation of entrepreneurs.

[18] Rodrik (2006) also notes that ironically, Chinese government policies, which are often lacking in coordination and conflicting among each other, seem to have provided suitable environment for these entrepreneurial experiments.

x = export;

X = total exports; and

Y = per-capita income.

High PRODY value indicates that the product is more sophisticated or can be categorized as a 'rich-country' product. The 'productivity' level associated with country j's export basket, $EXPY_j$, can now be defined as:

$$EXPY_j = \sum_l \left(\frac{x_{jl}}{X_j} \right) PRODY_l \qquad (4.9)$$

A high EXPY value means that the country has a high export productivity level. A country that exports more of high EXPY products will grow faster. We recognize that it may be difficult to give the relationship with income the direct causal interpretation since the causal effect may go from EXPY to income rather than vice-versa. Hausmann et al. (2000) however found evidence that across countries, those with initially high levels of EXPY experience higher growth in exports than those with lower levels of EXPY. This seems to suggest that the types of goods in which a country specialises has important implications for its subsequent economic performance and it is the case of 'You are what you produce'.

Decision-support model

The decision-support model was originally intended to help export promotion institutions in the planning and the assessment of export promotion activities, given their limited and scarce resources. This model is a screening procedure that involves collecting relevant information on world markets, and then filtering out

market opportunities that should be priorities for export promotion. The final objective would be to construct a 'choice set' of excellent opportunities in countries with sufficient macroeconomic strength and performance. Cuyvers et al. (1995) and Cuyvers (1997, 2004) have applied the model to identify Belgium's export opportunities and Thailand, respectively.

There are four consecutive steps or 'filter'. In each of the filters, less interesting market opportunities are deleted. It starts from the assumption that, in principle, all world markets are potential markets for all types of exports of the exporting country, therefore all markets should enter a screening procedure. The unit analysis is the product/country combination.

In the first filter, which is applied to all countries of the world, information such as the commercial and political risks, the macroeconomic growth and/or the size of the economy of each country, are used to filter out countries. The commercial and political risks are assessed using parameters such as the stock of foreign debt of a country in proportion to its GDP, the external debt service as as percentage of export earnings and so on, which are available through the IMF and other international organisations. Cuyvers (2004) has used the credit ratings of the Belgian public credit insurance agency. Countries which belong to two highest risks group will be excluded. Then, the GNP and GNP per capita of the remaining countries are compared with a cut-off point. The cut-off point, χ, of the GNP and per capita GNP is calculated as follows:

$$\chi = \overline{X} - \alpha\sigma_x \qquad (4.10)$$

where $\overline{X}$ is the average of X (GNP or per capita GNP), σ_x is the standard deviation of X, and α is a factor which is determined in such a way that a small change in its value will only affect the number of countries, marginally. Cuyvers et al (1995) and Cuyvers (1997,2004) chose α = 0.296. Hence, countries are selected when:

$X_j \geq \chi$ (Condition 1)

In the second filter, the market potential of the various product groups is assessed in a more specific way, using product-related criteria. These criteria are the short-term and long-term import growth of the various products and the relative import market size.

In this stage, the degree of specialization or the RCA of the exporting country (the country under study) is taken into account. A scaling factor for product j, s_j, is defined, which is given by:

$$s_j = 0.8 + \frac{1}{(RCA_j + 0.85)e^{(RCA_j - 0.01)}} \quad (4.11)$$

On the other hand, data on growth of imports of the various products for each selected country from the previous step ($g_{i,j}$), and the growth rate of the total world imports ($g_{world,j}$), are analysed. Short and long term growth are calculated. The short term growth is the percentage growth rate in the year of interest, while the long-run growth is calculated as the compound annual growth rate of the last few years. The cut-off point for import growth of product group j, G_j, is given as:

$$G_j = g_{World,j} * s_j \qquad if\ g_{world,j} > 0 \quad (4.12a)$$

$$G_j = g_{world,j} / s_j \qquad if\ g_{world,j} < 0 \qquad (4.12b)$$

The decision to choose the market in country i for product group j is when:

$$g_{i,j} \geq G_j \qquad \text{(Condition 2)}$$

This procedure is applied to calculate both short-term and long-term cut-off growth rates.

For the market size criterion, the objective is to select those markets which do not show growth, but are considered sufficiently large to absorb exports. Again, taking into consideration the degree of specialization of product group j of the exporting country, the cut-off point for relative import size S_j is given as:

$$S_j = 0.02M_{World,j} \qquad \text{if } RCA_j > 1; \text{ and} \qquad (4.13a)$$

$$S_j = [(3 - RCA_j)/100]M_{World,j} \qquad \text{if } RCA_j \leq 1 \qquad (4.13b)$$

where $M_{World,j}$ is the world's aggregate imports of product j.

The decision to choose the product/country combination as a possible export opportunity based on this criteria is when:

$$M_{i,j} \geq S_j \qquad \text{(Condition 3)}$$

Based on these two criteria, the product/country combinations can be categorized into different types which are shown in Table 4.1.

Table 4.1

The Categories of Product/Country Combinations

Category	Description
0	No short-term growth; No long-term growth; and No relative market size
1	Short-term growth only
2	Long-term growth only
3	Large relative market size only
4	Short-term growth and long-term growth
5	Short-term growth and large relative market size
6	Long-term growth and large relative market size
7	Short-term growth, long term growth and large relative market size

The product/country combination will only go to the next filter if it is showing either sufficient relative import market size (condition3) or sufficiently high import market growth in the short and long terms (condition2) i.e. those in the category 3 to 7.

The third filter will eliminate the markets which are more difficult to access due to all kinds of barriers to entry. The model considers two types of barriers. These are the degree of market concentration and import restrictions. Furthermore, this step only considers the product group which has an $RCA_j > 0.02$ with the argument that those products which have $RCA < 0.02$ are not likely to be 'export-ready'.

Market concentration is measured using the Herfindahl-Hirschman index which is calculated as:

$$HHI_{i,j} = \sum_{k} \left(\frac{X_{k,i,j}}{M_{tot,i,j}} \right)^2 \qquad (4.14)$$

Where $X_{k,i,j}$ is country k's exports of product group j to country i; and

$M_{tot,i,j}$ is country i's total imports of product group j.

Accordingly, high values of HHI imply that an import market is relatively concentrated (supplied by only a few countries), and therefore it will be more difficult for a new exporter to penetrate that market. The cut-off point for HHI, h_k, is defined as:

$h_k = -0.05\alpha\sigma_h$ for product/country combinations of category 3 (see Table 4.1);

$h_k = +0.05\alpha\sigma_h$ for product/country combinations of category 4,5 and 6 (see Table 4.1); and

$h_k = 0.15\alpha\sigma_h$ for product/country combinations of category 7 (see Table 4.1).

α is an exogenously determined factor, whose value is determined in such a way that a small change in its value will only have a marginal effect on the number of countries screened out (α value of 11.4 is chosen) and σ_h is the standard deviation of HHI. The decision to select the product/country combinations will be when:

$$h_k \geq HHI_{i,j} \qquad \text{(Condition 4)}$$

Import restrictions are proxied by the combined relative market share, m_{ij}, of the neighbouring countries of the exporting country. It is assumed that if the neighbouring countries can enter the targeted market i, for a particular product j, then there is *a priori* no reason why the exporting country should not be able to. An indicator of 'revealed absence of barriers to trade' is therefore given by:

$$m_{i,j} = \frac{\sum_k \frac{X_{k,i,j}}{X_{k,j}}}{\frac{X_{World,i,j}}{X_{World,j}}} \qquad (4.15)$$

where $X_{k,i,j}$ is the export of country k (the neighbouring country) to country i of product group j;

$X_{k,j}$ is country k 's total exports of product group j

$X_{World,i,j}$ is the world's export to country i of product group j; and

$X_{World,j}$ is the world's total exports of product group j.

This index shows the share of the neighbouring countries' exports to country i of product group j in their respective exports of product group j, corrected for the share of country i in the world export of product group j. The decision to select product/country combinations is based on:

$$m_{i,j} \geq 0.95 \qquad \text{(condition 5)}$$

which implies that apart from a margin of error of 5 percent, the exporting country is assumed to have no 'revealed barriers to trade' in a market if at least one of neighbouring countries has a 'revealed comparative advantage' in exporting to that market.

The product/country combinations which satisfy both condition 4 and condition 5 will be selected and become the country's realistic export opportunities.

In step 4, the product/country combinations chosen from the last step, are assessed in terms of the strengths and weaknesses of the exporting country in the respective markets. No product/country combination is filtered out in this stage. This step is more of categorizing the realistic export opportunities in terms of their relative market importance for the exporting country, and according to the target market's characteristics, such as the size of the market (small or large) and the growth of the market (short-term or long-term). The purpose of this last step is mainly to

help the export promotion agencies in deciding which type of promotional activity is suitable in each of the realistic export opportunity markets. So, for example in a market where the relative share of the exporting country is quite large and potential market is large and/or growing, an offensive strategy of market expansion is advocated. If the relative share of the exporting country in a potential market is small, then the export promotion agencies should not promote actively in these markets and in markets where the relative share of the exporting country is already large, then a defensive strategy would be more appropriate.

One of the main shortcomings of the decision support model is the use of historical data to determine the market attractiveness. According to Cuyvers et al. (1995) this could be improved by forecasting import demand or its determining factors such as consumption and production. However, such exercise would be very expensive and the required data to build a predictive model may not be available.

Some of the filters may be improved upon. For example, in filter three, the use of market concentration and the relative market share of neighbouring countries as proxies for barriers to entry may be quite stringent and may exclude potential markets.

Finally, the results from this model should be treated with caution. Export promotion activities are broader and can also be driven by other economic and non-economic forces such as political agendas.

4.3 Data and Methodology

We calculate Brunei's RCA with respect to the world and ASEAN, respectively. The reasons behind this are to compare Brunei's competitiveness vis-à-vis the world and Brunei's competitiveness vis-à-vis ASEAN, both at the global level and within ASEAN. We adopt the Balassa index to calculate Brunei's revealed comparative advantage of the different groups of commodities[19] we have chosen. This is given by:

$$RCA_{iB} = (x_{iB}/X_{iB}) / (X_{iC}/X_{tC}) \quad (4.16)$$

where:

subscript i = commodity type

subscript B = Brunei

subscript C = comparator (i.e. the world or ASEAN)

x_{iB} represents Brunei's export of commodity i;

X_{iB} represents Brunei's total exports;

X_{iC} represents the comparator export of commodity i; and

X_{tC} represents the value of comparator total exports.

We also use Vollrath's alternative RCA indices to calculate Brunei's RCA of the different types of commodities, as a way of counter-checking the results obtained using the Balassa index. This is given by:

$$RTA_{iB} = RXA - RMA \quad (4.17)$$

$$LRXA_{iB} = Log\ (RXA) \quad (4.18)$$

$$RC_{iB} = LRXA - LRMA \quad (4.19)$$

[19] For Brunei-ASEAN analysis, we use the values of exports to the world and values of exports to ASEAN for the calculations of RCA at the world level and at the ASEAN level, respectively.

Where RXA = $(x_{iB}/X_{nB}) / (X_{iw}/X_{nw})$ and RMA = $(m_{ij}/M_{nj}) / (M_{iw}/M_{nw})$

where subscript B = Brunei

subscript n = all traded goods minus commodity i;

subscript w = the set of countries (comparator) minus B;

RTA_{iB} = Relative Trade Advantage of commodity i for Brunei;

$LRXA_{iB}$ = Relative Export Advantage of commodity i for Brunei; and

RC_{iB} = Revealed Competitiveness of commodity i for Brunei.

We then calculate the income level of each of the commodities (PRODY). We limit our group of countries to ASEAN member countries. This gives the income level of ASEAN[20] which is:

$$PRODY_k = \sum_A \frac{(x_{Ak}/X_A)}{\sum_A (x_{Ak}/X_A)} Y_A \qquad (4.20)$$

where k = product type;

A = ASEAN member country;

x = export;

X = total export; and

Y = per-capita income.

Following Hausmann *et al* (2005), we take a three-year average value of PRODY from 2000-2002 to calculate the productivity level associated with Brunei's export basket to ASEAN, $EXPY_j$, so that the PRODY that goes into the construction of EXPY does not vary over years. $EXPY_j$, is now defined as:

$$EXPY_j = \sum_B \left(\frac{x_{jB}}{X_j} \right) PRODY_B \qquad (4.21)$$

[20] We note that there might be bias in the PRODY calculations of the commodity since we only cover ASEAN exports. It is beyond the scope of this chapter to calculate the global PRODY index as it requires the calculations of value-shares across all countries exporting the good.

For the calculations of the above indices, we use the United Nation's Standard International Trade Classification (SITC) revision 2 at the 3 digit level for the classification of the different commodities[21]. The rationale for using a higher disaggregation i.e. 3-digit level instead of 2-digit level, is that the former allows us to evaluate the individual product as opposed to a group of products. The commodities we have selected are Brunei's main non-oil exports which have a value greater than USD10,000 in 2003. These commodities are:

SITC	Product Name
011	Meat, fresh, chilled or frozen
012	Meat dried, salted or smoked
054	Vegetables, fresh or simply preserved
056	Vegetables prepared
211	Hides, skins excluding fur skins
243	Wood, shaped or simply worked
333	Petroleum, crude and partly refined
334	Petroleum products
343	Natural gas
661	Lime, cement and building material
662	Clay and refractory construction
663	Minerals and manufactures
842	Men's and boys' outerwear, textile fabrics not knitted or crocheted
843	Women's, girls', infants' outerwear, textile not knitted or crocheted
845	Outerwear knitted or crocheted, not elastic nor rubberized
846	Under-garments, knitted or crocheted

[21] Our data source come from the United Nations Commodity Trade Statistics Database (COMTRADE).

The decision-support model developed by Cuyvers (1997, 2004) is used to identify new potential exports. We use the SITC (rev 2) at 2-digit level in our analysis and also select products that have an export value of greater than USD 1,000 in 2003. The commodities are:

SITC code	Description	SITC code	Description
00	Live animals chiefly for food	29	Crude animal and vegetable materials
01	Meat and preparations	61	Leather, leather manufactures
02	Dairy products and birds' eggs	62	Rubber manufactures
03	Fish, crustacean and molluscs	63	Cork and wood, cork manufactures
04	Cereals and cereal preparations	64	Paper, paperboard and articles of pulp
05	Vegetable and fruit	65	Textile yarn, fabrics, made-up articles
06	Sugar and honey	66	Non-metallic mineral manufactures
07	Coffee, tea, cocoa, spices	67	Iron and steel
08	Feeding stuff for animals	68	Non-ferrous metals
09	Miscellaneous edible products	69	Manufactures of metals
21	Hides, skins and furskins, raw	81	Sanitary, plumbing, heating, lighting fixtures and fittings
22	Oil seeds and oleaginous fruit	82	Furniture and parts
23	Crude rubber	83	Travel goods, handbags
24	Cork and wood	84	Articles of apparel and clothing accessories
25	Pulp and waste paper	85	Footwear
26	Textile fibres and their wastes	87	Professional, scientific, controlling instruments, apparatus
27	Crude fertilizer and crude minerals	88	Photographic equipment and supplies, optical goods
28	Metalliferous ores and metal scrap	89	Miscellaneous manufactured articles

We have limited the number of countries included in this analysis. We only include those countries which have been Brunei's main trading partners. These countries are Malaysia, Singapore, Thailand, Philippines, Japan, Korea, Hong Kong China, China (mainland), UK, US, Australia and the EU (excluding the UK). The reason why we have not included all the countries in the world in our study is mainly because diversification of exports will be easier in foreign markets

in which Brunei is already established due to familiarity and past relations. We then conduct the filtering process up to the third step[22].

4.4 Results

The results of the calculations are divided into three parts. First, we look at Brunei's current exports' comparative advantage based on the Balassa index and the Vollrath indices. Following that we investigate the productivity levels of these exports which are calculated using the Hausmann *et al* (2005) index. Finally, we explore the export opportunities for Brunei as well as identifying the potential markets using the decision-support model.

4.4.1 Balassa index

We compare the results between Brunei's RCA with respect to the world, Brunei's RCA with respect to ASEAN countries in the world market and Brunei's RCA with respect to ASEAN countries within the ASEAN market. The full results are given in the Tables A4.1, A4.2 and A4.3 respectively in the Appendix.

Our results (Table A4.1) show that Brunei has a comparative advantage consistently throughout 1986-2003 in three of the exports, which are 'petroleum,

[22] The first step is macroeconomic country assessment. The second step involves finding out possible export opportunities based on growth rates and market size and the third step will filter out realistic export opportunities based on 2 types of barriers to entry namely market concentration and import restrictions (see pp. 11-15). We do not carry our analysis up the fourth step, which is the categorization of the markets as a function of the strength of the country's exports to these markets, because we find it is weakly relevant to the objective of this chapter. Further its purpose is intended for the planning and assessment of export promotion activities. Since our main objective is to identify new products, the first three steps are sufficient.

crude and partly refined' (333), 'petroleum products' (334) and 'natural gas' (343) i.e. the oil and gas products. It also reveals that Brunei has become more competitive internationally in some products in recent years, such as 'men's and boys' outerwear, not knitted' (842), 'women's and girls' outerwear, not knitted' (843), 'outerwear, knitted' (845) and 'under-garments, knitted' (846) which belong in the textile industry. This indicates the importance of this industry in Brunei's economy and could also mean that it has the potential to be strengthened.

The results in Appendix Table A4.2 show Brunei's comparative advantage with respect to ASEAN in the global context. In other words, we calculate the comparative advantage index using Brunei's export share of a commodity to the corresponding exports of ASEAN in the world market[23]. The figures show some positive development especially in very recent years. Excluding the oil and gas products, it appears that Brunei has also become competitive in 'dried meat' (012) and 'hides and skins, excluding fur' (211). This discovery should be taken up further by the relevant authority to analyse the performance of the production of these products and to look into the potential of the industries in the world market. Brunei also appears to be competitive in the textile industry particularly in the following products: 'men's and boys' outerwear, not knitted' (842), 'women's and girls' outerwear, not knitted' (843), 'outerwear, knitted' (845) and 'under-garments, knitted' (846).

Quite a different picture, however, can be seen from the results of Brunei's RCA *within* the ASEAN market. Here, we have used the data of the bilateral trade

[23] For a similar study of Hungary vis-à-vis the EU, see Ferto and Hubbard (2003).

between Brunei and ASEAN[24]. Brunei has lost competitiveness in a number of commodities (see Table A4.3), in particular, 'meat, fresh or frozen' (011), 'lime, cement and building material' (661) and 'clay and refractory construction' (662). For 'meat, fresh or frozen' (011), Brunei appears to have comparative advantage in the 1980's up until the mid 1990's when the index changes to become comparative disadvantage. For 'lime, cement and building material' and 'clay and refractory construction', on the other hand, Brunei was competitive in the mid 1990s until the late 1990's when the indices also change to reveal comparative disadvantage indicating Brunei's loss of competitiveness in these two particular products in the ASEAN market. At the same time, Brunei gained competitiveness in a number of products including 'dried meat' (012), 'men's and boys' outerwear, not knitted' (842), 'women's and girls' outerwear, not knitted' (843) and 'under-garments, knitted' (846). It is also interesting to note that within the ASEAN market, Brunei does not have a comparative advantage in 'natural gas' (343). Higher index values of some commodities in that can be seen in Table A4.2 as compared to those of Table A4.1 also indicate the importance of ASEAN as Brunei's main non-oil export partner. We could conclude that the Balassa index indicates that the AFTA has mixed effects on Brunei competitiveness. While some products are affected positively, others are not. However, such conclusions can be strengthened if a more realistic two-way trade is brought into the analysis. This is what we are going to see in the next section.

[24] For a similar study of Turkey vis-à-vis the EU, see Utkulu and Seymen (2004).

4.4.2 Vollrath's Index of Competitive Advantage

We calculate the indices for each of the commodities under different scenarios. First, we look at Brunei's trade in the world market. Then we compare the performances of Brunei's trade with ASEAN in the world market and subsequently within the ASEAN market.

According to Vollrath, positive values of the three indices, RTA, LRXA and RC indicate comparative advantage, whereas negative values indicate comparative disadvantage and in a distortion-free market environment, the RTA and the RC indices are more preferable because of the supply and demand balance embodied in it. Since Brunei has always been a low tariff country[25], we will pay particular attention to the RTA and RC indices.

The results of the calculated indices for each of the commodities, in the world market (see Table A4.4) show that besides the oil and gas products: 'petroleum, crude and partly refined' (333), 'petroleum products' (334) and 'natural gas' (343), the RTA and the RC index again indicate Brunei has a comparative advantage in 'hides, skins excluding fur' (211). It is also quite interesting to see that the textile industry seems to have started gaining competitiveness in the mid-1990s (see commodity 845). Brunei, however, lost competitiveness in 'meat, fresh or frozen' (011). Brunei appears to have comparative disadvantage in the rest of the products.

[25] In 2003, more than 95% of commodities had a zero tariff rate. With regard to non-tariff barriers (NTBs), Brunei has been progressing well in the elimination of NTBs especially with its trade with other ASEAN members. Efforts include harmonizing custom procedures, establishing the customs Green Lane, harmonizing technical standards and eliminating custom surcharges to CEPT products.

Turning to Brunei's performance as compared to ASEAN's, in the world market (see Table A4.5), a similar pattern to the previous results (Table A4.4) can be seen. Apart from the oil and gas commodities and 'hides and skins excluding fur' (211), Brunei has yet to gain competitiveness in the other products. The results for commodities in the textile industry which include 'men's and boys' outerwear, not knitted' (842), 'women's and girls' outerwear, not knitted' (843), 'outerwear, knitted' (845) and 'under-garments, knitted' (846) also show that Brunei does not compete well with ASEAN in the world market for textiles.

On the other hand, our analysis of Brunei's competitiveness against ASEAN member countries within the ASEAN market shows a slightly different pattern (see Table A4.6). The results show that Brunei's competitiveness in the textile industry in recent years has been restored. Comparing these results against the previous ones (see Table A4.5) for 'men's and boys' outerwear, not knitted' (842), 'women's and girls' outerwear, not knitted' (843), 'outerwear, knitted' (845) and 'under-garments, knitted' (846), may imply two scenarios: either Brunei's main textile export market is the ASEAN, or ASEAN's textile market is outside ASEAN. However so, Brunei should fully take this apparent advantage in this particular market, by trying to increase export of these commodities and at the same time try to venture into other types of textile products.

In terms of 'natural gas' (343), the findings in Section 4.4.1 (see also Table A4.3) can now be strengthened. It appears that ASEAN does not rely on Brunei to be their import market for gas despite Brunei's competitiveness in the world market.

We can now conclude that Brunei has yet to reap some benefits from AFTA. The gas market in ASEAN is an example where Brunei can enter into. There are also apparent potential for 'hides and skins excluding fur' (211) and the textile industry.

We conclude this section by summarising some of our findings. Firstly, we have discovered revealed competitiveness in two products, namely 'dried meat, salted and smoked' (012) and 'hides and skins excluding fur skins' (211). Analysis of the performance of these two goods should be carried out in order to look for their further potential in the non-oil sector. Secondly, the importance of the textile industry cannot be underestimated. There has indeed been some concern regarding the future of this industry particularly in the US market, in the light of the end of the Multifibre Agreement in 2005. However, our results have shown that the industry is also competitive in the ASEAN market implying that the future of this industry may not be as gloomy as has been suggested. Finally, Brunei has yet to gain competitiveness in other types of commodities. This implies that Brunei has to boost its diversification activities.

4.4.3 The Productivity Level of Exports.

Following Hausmann *et al* (2005) we calculate the income level associated with each of the commodities, PRODY. By limiting our group of countries to the ASEAN member countries, we will interpret the results within the ASEAN

context[26]. Table 4.2 shows the ranking of Brunei's main exports based on the income level of the ASEAN countries. The significance of this table is that it can be used as a direction in which Brunei can and should diversify its production, based on the income level of each of the commodities. Besides the oil and gas commodities: 'petroleum, crude and partly refined' (333), 'petroleum products' (334) and 'natural gas' (343) which have the largest PRODY value, and on which Brunei's economy has been dependent up to now, we now should give more attention to other non-oil commodities. Table 4.2 indicates that 'hides, skins excluding fur skins' (211) and 'dried meat, salted and smoked' (012) have higher income level as compared to the other non-oil products. This result is encouraging. As we have seen in the previous section, these latter commodities i.e. 'hides, skins excluding fur skins' and 'dried meat' are our newly discovered competitive commodities. Together with the present result, the potential for these types of products to be developed and produced more cannot be underrated.

The rest of the products could then be divided into 2 groups of having a similar level of income. Group one, consists of 'wood, shaped or simply worked' (243), 'under-garments, knitted' (846), 'clay and refractory construction' (662), 'Men's and boys' outerwear, knitted' (842) and 'prepared vegetables' (056) is considerably superior to group two, which are 'lime, cement and building material' (661), 'meat, fresh or frozen' (011), 'fresh vegetables' (054), 'outerwear, knitted' (845), 'minerals and manufactures' (663) and 'women's and girls' outerwear, not knitted' (843). What is also interesting about this result is that none

[26] ASEAN consists of 10 member countries: Brunei, Singapore, Malaysia, Thailand, Indonesia, Philippines, Vietnam, Laos, Myanmar and Cambodia. The combined GDP per capita in 2003 is US$1,267. Their share of total world export is around 6 %.

of the products that Brunei is currently producing can be considered as 'poor country' goods, as none have a very low income level.

Table 4.2

The Income Level of Each Commodity, $PRODY_k$

Commodity = k	Mean PRODY, 1999-2001
334: Petroleum, crude and partly refined	11,835.16
343: Natural gas	9,517.76
333: Petroleum products	6,613.51
211: Hides, skins excluding fur skins, raw	5,380.70
012: Meat dried, salted and smoked	4,706.33
243: Wood, shaped or simply worked	2,905.19
846: Under-garments, knitted or crocheted	2,632.88
662: Clay and refractory construction	2,309.71
842: Men's and boys' outerwear, textile fabrics not knitted	2,140.33
056: Vegetables prepared	2,020.54
661: Lime, cement and building material	1,952.68
011: Meat, fresh, chilled or frozen	1,857.98
054: Vegetables, fresh or simply preserved	1,832.49
845: Outerwear knitted or crocheted, not elastic nor rubberized	1,634.26
663: Minerals and manufactures	1,630.30
843: Women's, girls', infants' outerwear, textile not knitted	1,250.99

Source: Own calculations based on SITC data at 3 digit level.

Using the PRODY values, we now calculate the 'productivity' levels of Brunei's exports at the disaggregated level as well as at the aggregate level. We present two sets of results. Table 4.3 shows the productivity level of each of the commodities in the world market, while table 4.4 shows the productivity level in the ASEAN market. As can be seen, the tables show that the productivity levels of Brunei's non-oil exports are low across the commodities. However, the productivity levels of some of the textile commodities have shown improvements both at the world and at the ASEAN level. In fact, for 'outerwear, knitted' (845), the productivity is even higher at the world level than the ASEAN level which could indicate that its market is outside ASEAN.

Table 4.3

The Productivity Level of Brunei Exports in the World Market ($EXPY_{B,world}$), 1986-2003

Year	o11	o12	o54	o56	211	243	333	334	343	661	662	663	842	843	845	846
1986	4.31	0.09	0.60	0.15	0.06	0.01	2683.90	435.98	5032.67	0.01	0.27	0.03	0.10	0.03	0.01	0.00
1987	4.22	0.04	0.60	0.07	0.34	0.01	3226.16	531.15	4210.78	0.00	0.37	0.01	0.15	0.05	0.00	0.03
1988	6.12	0.17	0.79	0.09	0.50	0.02	2810.43	597.98	4757.69	0.01	0.68	0.01	0.14	0.08	0.00	3.99
1989	6.60	0.07	0.33	0.14	0.40	0.01	3095.98	629.21	4265.41	0.00	0.38	0.02	0.10	0.03	0.40	6.60
1990	8.80	0.09	0.32	0.11	0.29	0.00	3365.03	664.69	3810.33	0.02	0.54	0.26	0.84	0.85	1.74	6.34
1991	4.89	0.05	0.28	0.11	0.34	0.01	3137.94	571.98	4231.13	0.00	0.38	0.02	4.24	1.64	3.30	2.31
1992	4.72	0.05	0.28	0.10	0.33	0.01	3590.10	393.94	3963.78	0.00	0.00	0.00	0.13	0.78	6.24	7.04
1993	3.81	0.04	0.25	0.09	0.04	0.01	3364.51	413.63	4315.43	0.00	0.00	0.00	0.09	0.90	2.18	3.82
1994	2.98	0.03	0.10	0.04	0.28	0.01	3296.89	402.70	4324.90	0.00	0.00	0.00	0.89	0.84	13.36	9.64
1995	1.28	0.02	0.03	0.01	0.10	0.02	3353.44	572.61	3857.98	0.00	0.00	0.00	0.56	5.04	8.02	0.04
1996	0.49	0.01	0.02	0.01	0.11	0.03	3593.42	604.18	3598.76	0.00	0.00	0.00	0.45	1.52	12.59	0.50
1997	0.33	0.02	0.00	0.01	0.16	0.03	2744.55	328.92	4457.25	2.94	0.34	0.14	6.66	1.64	16.74	14.92
1998	0.08	0.01	0.01	0.02	0.10	0.01	2231.28	269.87	5002.15	0.24	0.12	0.11	8.62	2.21	44.46	27.79
1999	0.16	0.01	0.00	0.01	0.10	0.01	1839.27	221.27	3457.21	1.24	0.18	0.09	5.56	1.40	45.23	4.67
2000	0.06	0.01	0.01	0.00	0.36	0.08	1940.10	121.08	2507.59	0.01	0.03	0.08	20.39	4.31	34.92	13.35
2001	0.09	0.01	0.00	0.00	0.44	0.13	2934.17	214.73	4108.02	0.02	0.04	0.14	27.76	2.19	18.32	32.28
2002	0.11	0.02	0.01	0.00	0.69	0.11	3132.42	164.39	3738.17	0.02	0.05	0.10	35.94	11.20	26.92	31.86
2003	0.08	0.03	0.01	0.00	0.41	0.04	3226.85	46.79	3662.32	0.06	0.09	0.12	28.17	10.45	27.54	34.88

Source: own calculation

Table 4.4

The Productivity Level of Brunei Exports in the ASEAN Market ($EXPY_{B,ASEAN}$), 1986-2003

Year	o11	o12	o54	o56	211	243	333	334	343	661	662	663	842	843	845	846
1986	25.45	0.53	3.47	0.88	0.327	0.06	5644.51	61.86	0.00	0.05	1.60	0.16	0.57	0.16	0.03	0.03
1987	18.48	0.18	2.62	0.32	1.333	0.03	5815.95	299.48	0.00	0.01	1.63	0.05	0.64	0.20	0.03	0.14
1988	34.34	0.95	4.43	0.49	2.822	0.11	5564.11	470.89	0.00	0.05	3.81	0.04	0.76	0.32	0.09	1.68
1989	34.99	0.35	1.77	0.76	0.986	0.05	5726.58	34.90	0.00	0.41	2.01	0.11	0.52	0.14	0.03	0.46
1990	42.05	0.43	1.51	0.53	1.409	0.01	5754.46	23.15	0.00	0.11	2.55	0.62	1.14	1.05	0.07	2.20
1991	24.66	0.27	1.39	0.56	1.701	0.04	5928.14	32.23	0.00	0.02	1.91	0.12	0.71	0.35	0.01	0.26
1992	20.07	0.22	1.07	0.39	1.385	0.04	6572.76	47.79	0.00	0.02	0.01	0.01	0.08	0.04	1.33	0.34
1993	18.26	0.20	1.07	0.39	0.202	0.05	6606.35	8.07	0.00	0.03	0.04	0.02	0.00	0.07	0.52	0.01
1994	12.57	0.14	0.37	0.14	1.194	0.03	6511.61	108.82	0.00	0.05	0.06	0.03	0.39	0.90	2.82	10.43
1995	6.19	0.07	0.15	0.05	0.439	0.08	6313.87	177.19	0.00	2.45	0.87	0.46	0.07	0.72	0.75	0.03
1996	2.42	0.03	0.07	0.03	0.498	0.14	6140.56	191.39	0.00	1.25	4.42	2.31	0.04	0.30	1.88	0.05
1997	1.56	0.07	0.01	0.03	0.544	0.16	5184.84	101.14	0.02	14.01	1.63	0.63	3.50	0.29	0.41	1.36
1998	0.56	0.08	0.05	0.12	0.668	0.03	4506.12	114.60	0.03	1.57	0.82	0.67	21.07	3.86	7.25	3.21
1999	0.52	0.03	0.01	0.02	0.263	0.05	4535.08	47.10	0.02	3.70	0.53	0.28	6.84	1.16	5.63	0.32
2000	0.25	0.03	0.02	0.01	1.105	0.29	4710.58	29.43	0.01	0.04	0.09	0.26	28.65	4.09	4.62	0.41
2001	0.40	0.03	0.02	0.01	1.016	0.10	4201.73	185.74	0.01	0.08	0.16	0.60	84.29	5.78	1.67	51.54
2002	0.50	0.07	0.04	0.01	1.543	0.48	4569.09	35.27	0.08	0.09	0.21	0.41	54.41	10.30	3.60	45.76
2003	0.41	0.14	0.02	0.02	1.258	0.13	3908.09	112.48	128.88	0.31	0.46	0.60	51.52	10.36	0.42	89.46

Source: own calculation

Table 4.5

The Productivity Level of Brunei's Total Exports ($EXPY_B$), 1986-2003

Year	World Market		ASEAN Market	
	Total Exports	Non-oil Exports	Total Exports	Non-oil Exports
1986	8592.16	7.36	5739.69	33.33
1987	8495.15	7.95	6141.10	25.67
1988	8588.20	14.78	6084.91	49.90
1989	8463.54	15.02	5804.07	42.58
1990	8365.49	21.54	5831.30	53.69
1991	8445.15	18.81	5992.37	32.00
1992	8600.29	13.38	6645.56	25.01
1993	8683.38	5.18	6635.28	20.86
1994	8622.01	23.81	6649.55	29.11
1995	7619.39	15.02	7503.39	12.33
1996	7929.13	20.01	7345.38	13.43
1997	8053.89	43.41	5310.20	24.19
1998	7973.46	80.91	4660.73	39.98
1999	7032.86	13.01	2901.55	19.35
2000	7014.44	35.94	2279.88	39.85
2001	7895.27	81.44	4533.17	145.68
2002	7757.49	107.09	4721.87	117.43
2003	7706.61	97.19	4304.55	155.11
Summary Statistic				
Mean	7768.67	30.10	7156.59	51.75
Coefficient of Variation (%)	14.54	119.04	32.92	113.60

Source: own calculation

Table 4.5 shows the aggregate values of the productivity level. We separate the results into total exports and non-oil exports. As can be seen from the table, by including the oil and gas exports, Brunei has a considerably high productivity level of exports. However, once oil and gas are removed from the picture, the productivity level values drop tremendously. The summary statistic (mean and coefficient of variation) also show the contrast in the productivity level values between total exports and non-oil exports, the mean values for the former are large while the latter are very low. The coefficients of variation indicate that the values

for the total exports are relatively stable whereas the non-oil exports appear to be unstable.

We conclude this section by re-emphasizing the need for the relevant industrial agency to look into the potential of the two products types which have relatively high PRODY value, namely 'hides, skins excluding fur skins' and 'meat dried, salted and smoked' to be developed. We have also seen from the EXPY values that Brunei's non-oil exports are doing very poorly. This cannot be the result of the types of products Brunei is exporting since none of the products are deemed 'poor income' goods. Rather, it seems that the main issue Brunei is facing is a supply constraint. While this issue merits a research of its own, it is the purpose of this chapter to find out the directions in which Brunei should gear its non-oil sector, which we attempt to address in the next section.

4.4.4 The Decision-Support Model

We follow the filtering steps of the decision support model (Cuyvers, 1997, 2004). In the first stage of the filtering process, none of the 12 countries we have included in our analysis (Malaysia, Philippines, Singapore, Thailand, Japan, UK, China Hong Kong, China mainland, Korea, UK, US and the EU) gets to be excluded. They pass the filter criterion of the GDP or GDP per capita. Since none of these countries are listed as 'high risk' countries in Cuyvers et al. (1994) and Cuyvers (2004) we can safely assume that they also pass the risk criteria.

With 12 countries and 36 different types of products, we have an initial total of 432 product/market combinations that go into the second filtering process. In this stage, two criteria are used to eliminate non-interesting product/market combinations. These are the import growth rate criteria and market size. We calculate the short-term and the long-term import growth rate for each product of each country. The short-term growth rate is measured by the compound annual growth rate between 2000 and 2003, while the long-term growth rate is measured by the compound annual growth rate between 1993 and 2003. Condition 2 implies that the market in a particular country for a particular product group will be deemed sufficiently promising if the import growth rate of that product in the country is greater or equal to its cut-off point for import growth.

We also look at the size of each market. Taking into account Brunei's RCA of each of the products, we calculate the cut-off point for relative import market size, which is given by equations 4.13a and 4.13b. Applying condition 3, the relative import market size of a particular country for a particular product is considered sufficiently large if the value of import of that product in the country is higher or equal to the cut-off point for relative import market size.

Following Cuyvers (2004), the product/market combinations that will be selected are those which show either sufficient relative import market or sufficiently high import market growth in the short and long term. Table 4.6 gives the distribution of the 432 product/market combinations according to the different categories.

Table 4.6

The Distribution of Product/Country Combinations According to Import Market Growth and Import Market Size.

Category	Description	No of product/country combination
0	No short-term growth; No long-term growth; and No relative market size	201
1	Short-term growth only	31
2	Long-term growth only	17
3	Large relative market size only	131
4	Short-term growth and long-term growth	22
5	Short-term growth and large relative market size	9
6	Long-term growth and large relative market size	2
7	Short-term growth, long term growth and large relative market size	19
	TOTAL	432

Source: Own calculations

On the basis of the two criteria, the product/market combinations in category 0, 1 and 2 are eliminated in this stage. Now we are left with 183 product/market combinations: 131 product/market combinations are in relatively large markets (category 3), 22 product/market combinations are in a growing market (category 4), 11 product/market combinations are in a growing and relatively large market (category 5 and 6) and 19 product/market combinations are in the most potential market, where the markets are relatively large and growing both in the short and long-term.

We now analyse the 183 product/market combinations in the third filtering stage. At this stage, we should be able to select Brunei's realistic export opportunities

based on three filtering criteria. First, we will only consider those products for which Brunei shows RCA > 0.02. This is mainly because those products which have RCA < 0.02[27] are likely to be irrelevant (for example they may not be 'export-ready'). As a result we eliminate 113 product/market combinations and hence are left with 70 product/market combinations.

Secondly, we compare the market concentration index (HHI) for each of the products in each of the markets with the cut-off point for HHI (h_k) calculated for each of the product/market category (see Table 4.6), and select only the product/market combinations in which the cut-off point is equal to or greater than the HHI. We have used the cut-off points in Cuyvers (2004)[28]. These are 0.115 for product/market combinations in category 3 (see Table 4.6), 0.462 for product/market combinations in categories 4, 5 and 6, and 0.809 for product/market combinations in category 7. Hence, in relatively large markets, we require the degree of concentration, HHI, to be no higher than 11.5 percent. In relatively large and growing markets we require the degree of concentration to be no higher than 46.2 percent while in a relatively large market and expanding in the short and long-term, the degree of concentration should not be higher than 80.9 percent. We are now left with 69 product/market combinations after eliminating one product/market combination.

[27] We have performed a sensitivity analysis in choosing the value of RCA. The numbers of product/market combinations were reduced to 44, 38 and 35 when we increased the RCA values to 0.03, 0.04 and 0.05 respectively. Because of the significant reduction in the number of product/market combination (from 70 to 44) and also following Cuyvers (2004), we chose to consider products that have RCA > 0.02.

[28] The use of cut-off points calculated in Cuyvers (2004) is more appropriate as their study covers a greater numbers of product/market combinations. Since our study only covers 12 foreign markets, attempts to calculate the cut-off points are futile.

Next, we calculate the 'revealed absence of barriers to trade' index for each product/market combination. We have selected Malaysia, Philippines, Singapore and Thailand as the neighbouring countries. Hence equation 4.15 is now given as:

$$m_{i,j} = \frac{\frac{X_{Mal,i,j}}{X_{Mal,j}} + \frac{X_{Phil,i,j}}{X_{Phil,j}} + \frac{X_{Sing,i,j}}{X_{Sing,j}} + \frac{X_{Thai,i,j}}{X_{Thai,j}}}{\frac{X_{World,i,j}}{X_{World,j}}} \qquad (4.22)$$

We select product/market combinations in which $m_{i,j} \geq 0.95$.

Based on the three criteria above, we have identified 60 realistic export opportunities for Brunei, hence eliminating a total of 372 product/market combinations. Table 4.7 shows the types of products which we have identified and the potential markets while Figure 4.1 shows the summary of the subsequent steps in the selection process.

Figure 4.1:
Selection of Realistic Export Opportunities for Brunei, 2003

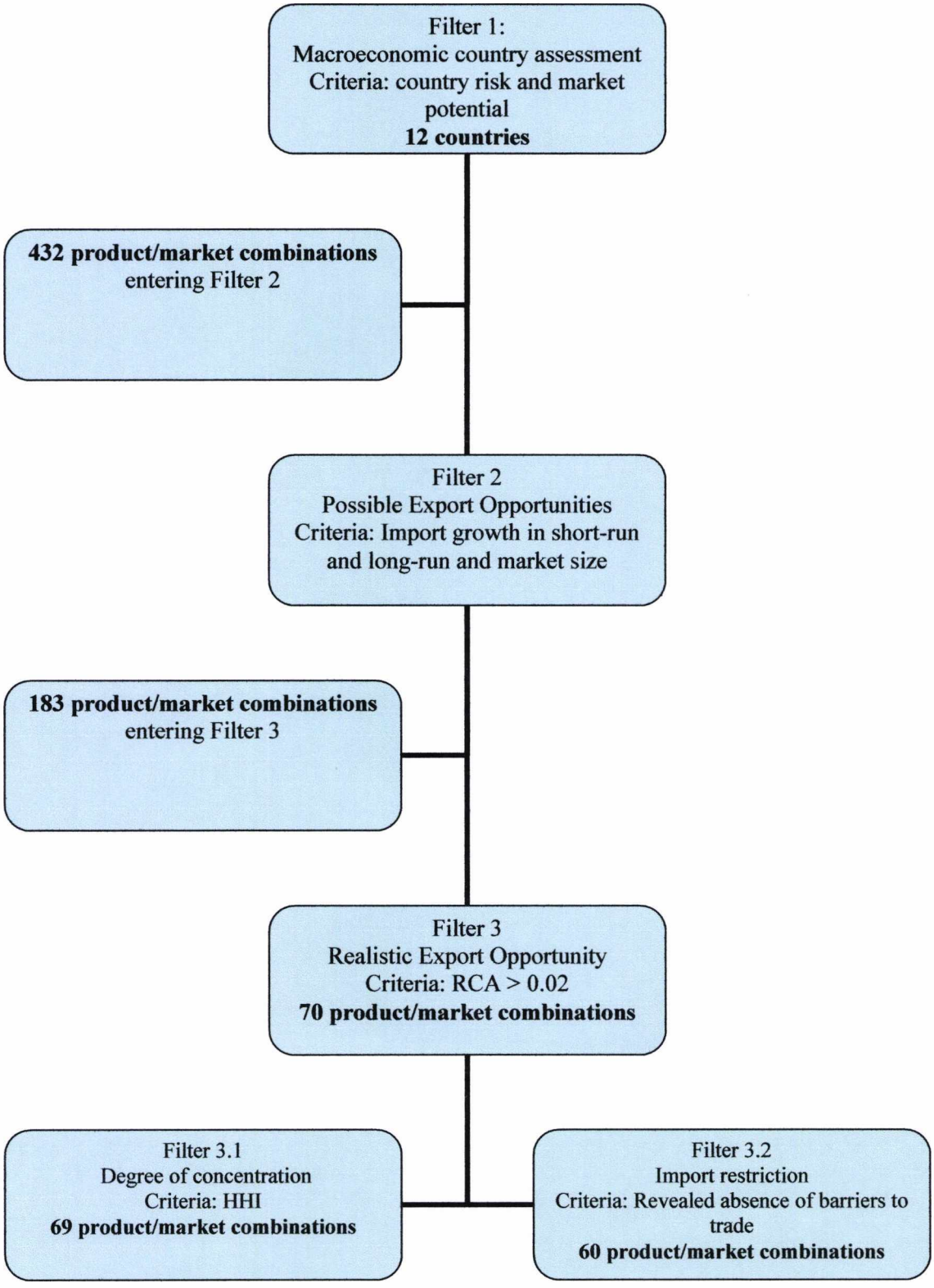


Table 4.7: Brunei's Realistic Export Opportunities

SITC Code	Description	Potential Markets
03	Fish, crustacean and molluscs	Japan, UK, US, EU
07	Coffee, tea, cocoa, spices	Malaysia, Thailand, Japan, UK, US, EU
21	Hides, skins and furskins, raw	Singapore, Korea, US, EU
25	Pulp and waste paper	Japan, Korea, UK, US, China,EU
27	Crude fertilizer and crude minerals	Japan, China
28	Metalliferous ores and metal scrap	Japan, Korea, China, UK, US, EU
62	Rubber manufactures	China, UK, US, EU
65	Textile yarn, fabrics, made-up articles	Hong Kong, Japan, China, UK, US, EU
67	Iron and steel	Korea, China, US
69	Manufactures of metals	Hong Kong, Japan, China, UK, US, Australia
84	Articles of apparel and clothing accessories	Singapore, Japan, Korea, UK, US, Australia, EU
87	Professional, scientific, controlling instruments	Japan, Korea, China, UK, US, EU

Sources: Own calculations

We further analyse the results in Table 4.7, in terms of the types of markets for each product/market combination. We find that out of the 60 realistic product/market opportunities, 9 of them can be categorized as relatively large markets and growing in the short and long term (i.e. those belonging to category 7 in Table 4.6) and 11 are in relatively large and growing markets (category 6). These 20 product/market combinations should be considered the most promising export potentials and these are:

- Coffee, tea, cocoa, spices in Malaysia and Thailand
- Hides, skins and furskins in Singapore
- Pulp and waste paper in China market
- Crude fertilizer and crude minerals in China

- Metalliferous ores and metal, scrap in China
- Rubber manufactures in China
- Iron and steel in China
- Manufactures of metals in Australia, China, Japan, the UK and the US
- Articles of apparel and clothing accessories in Australia, Singapore, Korea, the UK, the US and the EU
- Professional, scientific, controlling instruments in China.

Meanwhile, Table 4.8 shows the current values and the major markets of the exports of these products of which Malaysia and Singapore appear to be the two main partners of most of Brunei's non-oil exports.

Table 4.8: Values of Exports and Major Markets for Selected Products, 2003

Commodity	Export Value (USD)	Major Market*
Coffee, tea, cocoa, spices	283,457	Malaysia (99%)
Hides, skins and furskins, raw	317,853	Thailand (44%), India (39%)
Pulp and waste paper	128,042	Malaysia (95%)
Crude fertilizer and crude minerals	479,050	Malaysia (95%)
Metalliferous ores and metal scrap	1,611,406	Malaysia (67%), Singapore (33%)
Rubber manufactures	1,577,277	The US (48%), Singapore (19%), Malaysia (10%), Indonesia (5%).
Iron and steel	4,558,990	Singapore (57%), Malaysia (32.5%), Thailand (4.2%) and Indonesia (3.8%)
Manufactures of metals	39,481,676	Malaysia (56.5%), Singapore (39.4%), Hong Kong (1.7%).
Articles of apparel and clothing accessories	218,309,424	The US (68.4%), Singapore (28.7%), Canada (1%).
Professional, scientific, controlling instruments	4,546,749	Malaysia (36.7%), Singapore (26.7%), the US (15.2%), Germany (7.9%) and the UK (6.7%).

Source: United Nations Commodity Trade Statistic Database (COMTRADE)
*Note: The figures in parentheses are percentage share.

Our results here complement our results in the previous two sections for some of the products, in particular for 'hides, skins and furskins' (21) and 'articles of apparel and clothing accessories' (84) in which we found that Brunei has revealed comparative advantage. 'Dried meat', however, does not make it into the list. Nevertheless, our findings further show that there is a large potential for 'articles of apparel and clothing accessories' (84) to be expanded to other markets[29] such as Australia, Korea, the EU and the UK. By expanding exports to these markets, the issue of the lack of quantity in the export of these products which we raised in the last section, may be tackled. Further, the concern over the future of the textile industry now can be mitigated as there are a number of potential markets to be penetrated. Since Brunei has already been exporting these products, one policy recommendation is for the export promotion agencies to strengthen the promotions of these products in existing markets, as a form of 'defence strategy'.

Our findings show that there exist quite a number of untapped realistic opportunities for the non-oil export in Brunei in the markets where Brunei already has trade relations. We also find that of the four ASEAN member countries included in this analysis, Malaysia and Singapore appear to be the most promising markets for Brunei's exports. It is also interesting to see that China is a potential market for many of the identified products which could be realised in the not too distant future, made possible through the ASEAN-China Free Trade Area agreement[30].

[29] Brunei's current main customers for its textile products are the US and Singapore.
[30] ASEAN-China Free Trade Area is scheduled to take effect from 2010.

4.5 Conclusions

We have presented an analysis of the competitiveness of Brunei's main exports in relation to the world as well as ASEAN, based on four indices of revealed comparative advantage, computed for the period 1986 to 2003. We have also looked at the income level for each product as an indicator of how 'sophisticated' the product is in the ASEAN context. On that basis, we have also analyzed Brunei's productivity level for each of the products. Using a decision-support model, we have also identified 60 product/market combinations which are considered as realistic export opportunities for Brunei non-oil exports.

Our analyses have found some interesting results. Firstly, we discover that currently there are two products which have apparent competitiveness. These are 'hides and skins' and 'dried meat'. Coincidently, these products also appear to be among Brunei's 'high income' products. Hence, there is a strong need for the relevant government agencies to look into the potential of these products, not only in terms of increasing the production quantity but also the possibility of creating by-products.

Secondly, we find that the types of non-oil products that Brunei is currently producing are those of reasonable income level. None of the products can be considered as 'low income' products. This implies that Brunei is actually in an advantageous position since the know-how of producing the products is already in place. We find that it may not be the issue of the 'types' of products that Brunei is currently facing, rather it is the issue of the lack of volume. In relation to this, we

should also learn lessons from the experience of China. In particular, 'self discovery' environment has to be provided for entrepreneurs and investors to conduct such self discovery activities. This is where the government has a role to play, since the market system on its own cannot provide such an environment. There are a number of policy instruments and mechanisms such as public sector credit, tax holidays, investment subsidies and even trade protection to name a few, that can be used to promote innovation. While we are not implying that the Brunei government has not looked into the possibilities and effectiveness of such mechanisms[31], based on our results however, such efforts have not been very fruitful.

Finally, we find that there are 60 product/market combinations that Brunei can venture into which include 12 types of products and 10 different countries. Of this total, there are 20 product/market combinations which are deemed highly realistic opportunities. We believe our findings have important policy implication for Brunei's diversification strategy as we now have a set of 'choice' products and markets that can be concentrated on.

With regard to Brunei's accession to AFTA, we find that there are signs of positive effects from the trade arrangement particularly in relation to the textile industry. We also find that Malaysia and Singapore are the two member countries which present themselves as large potential markets for a number of Brunei's

[31] We note that Brunei is giving a tax holiday to pioneer industries as a part of industrial promotion. There are also a number of government financial schemes available which are offered to the private sector. However, none of these efforts appear able to entice a large amount of investment in the country. Hashim (1998) bluntly concludes *that the 'big push' is indeed a 'small push' with respect to the diversification policy that Brunei economy has been seeking.*

exports. In the light of ASEAN-China Free Trade Agreement, it is also interesting to note that the Chinese market can offer some realistic opportunities.

APPENDICES TO CHAPTER 4

Table A4.1: Brunei's Revealed Comparative Advantage with Respect to the World, 1986-2003: The Balassa Index

Year	o11	o12	o54	o56	211	243	333	334	343	661	662	663	842	843	845	846
1986	0.26	0.03	0.07	0.04	0.00	0.00	14.74	1.52	60.39	0.00	0.05	0.01	0.01	0.00	0.00	0.00
1987	0.26	0.02	0.07	0.02	0.03	0.00	14.89	2.09	70.60	0.00	0.07	0.00	0.01	0.00	0.00	0.00
1988	0.27	0.05	0.07	0.02	0.03	0.00	11.31	1.88	51.08	0.00	0.09	0.00	0.01	0.01	0.00	0.37
1989	0.36	0.03	0.04	0.04	0.04	0.00	29.95	3.08	64.69	0.02	0.06	0.00	0.01	0.00	0.03	0.67
1990	0.49	0.04	0.03	0.03	0.03	0.00	18.46	2.84	51.43	0.00	0.09	0.05	0.05	0.07	0.12	0.63
1991	0.27	0.02	0.03	0.03	0.05	0.00	13.91	2.13	49.08	0.00	0.07	0.01	0.23	0.13	0.21	0.21
1992	0.24	0.02	0.03	0.03	0.05	0.00	14.75	1.56	50.08	0.00	0.00	0.00	0.01	0.06	0.38	0.58
1993	0.23	0.02	0.03	0.03	0.01	0.00	16.08	1.77	59.92	0.00	0.00	0.00	0.00	0.07	0.15	0.33
1994	0.19	0.02	0.01	0.01	0.04	0.00	17.34	1.89	75.92	0.00	0.00	0.00	0.05	0.07	1.01	0.90
1995	0.08	0.01	0.00	0.00	0.02	0.00	24.51	3.05	75.05	0.13	0.04	0.02	0.03	0.49	0.67	0.00
1996	0.03	0.00	0.00	0.00	0.02	0.00	19.08	2.61	41.11	0.06	0.21	0.11	0.03	0.15	1.05	0.04
1997	0.02	0.01	0.00	0.00	0.03	0.00	14.81	1.52	44.60	0.69	0.08	0.03	0.39	0.16	1.20	1.15
1998	0.01	0.01	0.00	0.01	0.02	0.00	13.78	1.52	60.16	0.06	0.03	0.03	0.50	0.21	3.26	2.15
1999	0.01	0.01	0.00	0.00	0.03	0.00	7.79	1.04	40.04	0.32	0.04	0.02	0.35	0.14	3.33	0.37
2000	0.01	0.01	0.00	0.00	0.08	0.01	5.53	0.39	20.39	0.00	0.01	0.02	1.33	0.45	2.74	1.13
2001	0.01	0.00	0.00	0.00	0.09	0.01	9.33	0.76	30.95	0.00	0.01	0.04	1.78	0.22	1.35	2.69
2002	0.01	0.01	0.00	0.00	0.15	0.01	11.10	0.65	32.66	0.01	0.01	0.03	2.41	1.07	1.94	2.60
2003	0.01	0.02	0.00	0.00	0.10	0.00	10.65	0.17	27.31	0.02	0.02	0.03	1.98	1.05	2.02	2.90

Source: own calculation

Table A4.2

Brunei's Revealed Comparative Advantage with Respect to ASEAN Countries in the World Market, 1986-2003: Balassa Index

Year	o11	o12	o54	O56	211	243	333	334	343	661	662	663	842	843	845	846
1986	0.95	0.20	0.03	0.03	0.01	0.00	3.63	0.44	9.17	0.00	0.26	0.32	0.01	0.00	0.00	0.00
1987	0.88	0.08	0.03	0.02	0.11	0.00	4.77	0.65	11.34	0.00	0.31	0.12	0.01	0.00	0.00	0.00
1988	5.56	0.22	0.16	0.09	4.41	0.00	16.04	17.17	62.97	0.01	2.19	0.04	0.01	0.01	0.00	0.47
1989	1.37	3.98	0.02	0.04	0.25	0.00	6.48	0.75	15.56	0.02	0.20	0.04	0.00	0.00	0.02	0.43
1990	1.69	4.80	0.02	0.03	0.31	0.00	6.55	0.67	11.82	0.01	0.37	0.25	0.03	0.06	0.08	0.33
1991	0.86	1.53	0.02	0.03	0.56	0.00	8.05	0.68	13.71	0.00	0.28	0.03	0.18	0.13	0.18	0.13
1992	0.94	0.79	0.02	0.03	1.04	0.00	9.65	0.61	12.99	0.00	0.00	0.00	0.01	0.08	0.36	0.46
1993	1.00	0.67	0.03	0.03	0.14	0.00	11.78	0.69	16.48	0.00	0.01	0.01	0.00	0.10	0.16	0.29
1994	0.87	0.40	0.02	0.01	0.83	0.00	14.75	0.82	21.47	0.01	0.01	0.01	0.05	0.09	1.04	0.74
1995	0.45	0.22	0.01	0.00	0.29	0.00	26.15	1.48	25.48	0.31	0.22	0.11	0.04	0.67	0.68	0.00
1996	0.20	0.07	0.00	0.00	0.27	0.00	25.99	1.31	20.46	0.15	1.15	0.55	0.04	0.22	1.42	0.05
1997	0.15	0.26	0.00	0.00	0.45	0.00	15.38	0.82	20.65	1.38	1.14	0.10	0.75	0.28	1.76	1.57
1998	0.03	0.32	0.00	0.01	0.27	0.00	17.52	0.75	27.14	0.10	0.44	0.09	0.87	0.37	4.28	2.81
1999	0.06	0.25	0.00	0.00	0.21	0.00	13.42	0.57	22.28	0.36	0.35	0.06	0.53	0.21	4.56	0.51
2000	0.03	0.24	0.00	0.00	0.55	0.01	11.89	0.24	11.96	0.00	0.06	0.04	1.98	0.60	3.88	1.48
2001	0.03	0.42	0.00	0.00	0.87	0.01	16.07	0.53	16.74	0.00	0.07	0.08	2.78	0.30	1.87	3.41
2002	0.04	2.79	0.00	0.00	1.43	0.01	18.08	0.41	17.01	0.01	0.09	0.05	3.02	1.22	1.80	3.27
2003	0.03	4.33	0.00	0.00	1.19	0.00	18.32	0.10	16.02	0.03	0.18	0.08	2.58	1.20	7.69	3.37

Source: own calculation

Table A4.3

Brunei's Revealed Comparative Advantage with Respect to ASEAN Countries in the ASEAN Market, 1986-2003: Balassa Index

Year	o11	o12	o54	O56	211	243	333	334	343	661	662	663	842	843	845	846
1986	5.58	1.16	0.15	0.19	0.06	0.00	7.64	0.06	0.00	0.02	1.54	1.83	0.04	0.01	0.00	0.00
1987	3.87	0.35	0.12	0.08	0.45	0.00	8.59	0.37	0.00	0.00	1.35	0.44	0.03	0.01	0.00	0.01
1988	31.20	1.25	0.92	0.49	24.74	0.00	31.75	13.52	0.00	0.04	12.30	0.22	0.07	0.06	0.01	0.20
1989	7.26	20.98	0.10	0.20	0.62	0.00	11.99	0.04	0.00	0.10	1.08	0.18	0.02	0.01	0.00	0.03
1990	8.07	22.95	0.09	0.14	1.46	0.00	11.20	0.02	0.00	0.04	1.75	0.61	0.05	0.07	0.00	0.11
1991	4.36	7.71	0.10	0.14	2.82	0.00	15.21	0.04	0.00	0.01	1.40	0.13	0.03	0.03	0.00	0.01
1992	4.00	3.35	0.08	0.10	4.43	0.00	17.66	0.07	0.00	0.01	0.00	0.02	0.00	0.00	0.08	0.02
1993	4.76	3.21	0.12	0.13	0.66	0.00	23.13	0.01	0.00	0.02	0.03	0.03	0.00	0.01	0.04	0.00
1994	3.66	1.67	0.06	0.05	3.48	0.00	29.14	0.22	0.00	0.02	0.06	0.03	0.02	0.10	0.22	0.80
1995	2.16	1.05	0.03	0.02	1.25	0.00	61.95	0.46	0.00	1.34	0.98	0.52	0.01	0.10	0.06	0.00
1996	0.99	0.36	0.02	0.01	1.22	0.01	63.04	0.41	0.00	1.67	5.13	2.73	0.00	0.04	0.21	0.00
1997	0.70	1.23	0.00	0.01	1.52	0.01	29.05	0.25	0.00	6.59	5.48	0.46	0.39	0.05	0.04	0.14
1998	0.21	2.16	0.02	0.08	1.80	0.00	35.38	0.32	0.00	1.64	2.92	0.56	2.12	0.65	0.70	0.32
1999	0.21	0.83	0.00	0.01	0.56	0.00	13.39	0.12	0.00	1.07	1.06	0.17	0.66	0.17	0.57	0.04
2000	0.12	0.91	0.01	0.00	1.69	0.03	13.55	0.06	0.00	0.01	0.21	0.14	2.78	0.57	0.51	0.05
2001	0.13	1.73	0.01	0.00	2.03	0.01	23.02	0.46	0.00	0.02	0.30	0.32	8.44	0.80	0.17	5.44
2002	0.17	12.40	0.02	0.01	3.21	0.05	26.37	0.09	0.00	0.03	0.41	0.22	4.57	1.13	0.24	4.70
2003	0.14	21.48	0.01	0.02	3.64	0.01	22.19	0.25	0.56	0.13	0.89	0.37	4.72	1.19	0.12	8.64

Source: own calculation

Table A4.4

Brunei's Revealed Comparative Advantage with Respect to the World, 1986-2003: The Vollrath Index.

Year	011			012			o54			o56			211			243		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	1.62	1.3	0.58	-1.60	-10.9	-11.3	-1.37	-2.67	-3.03	-1.54	-3.19	-3.65	0.00	-5.3	-0.35	-0.03	-7.23	-3.84
1987	2.03	1.46	0.63	-2.07	-11.7	-12.4	-1.35	-2.72	-3.06	-1.38	-3.99	-4.33	0.03	-3.52	4.35	-0.04	-7.69	-4.37
1988	3.33	1.58	1.15	-0.96	-10.2	-10.2	-1.04	-2.73	-2.83	-1.09	-3.88	-3.98	0.03	-3.44	4.83	-0.05	-7.08	-4.12
1989	4.36	1.91	1.03	-0.16	-11.2	-9.3	-1.31	-3.36	-3.65	-1.45	-3.24	-3.64	0.04	-3.2	5.88	-0.18	-7.69	-5.97
1990	6.41	2.19	1.26	-0.76	-10.9	-10.6	-1.11	-3.5	-3.63	-1.68	-3.48	-4.02	0.03	-3.41	4.25	-0.23	-8.7	-7.22
1991	3.38	1.67	1.01	-0.75	-11.4	-11.1	-1.02	-3.66	-3.70	-1.60	-3.49	-3.98	0.01	-2.97	0.22	-0.39	-7.55	-6.62
1992	3.33	1.64	1.03	-0.34	-11.4	-10.3	-0.95	-3.59	-3.57	-1.52	-3.61	-4.04	0.04	-3.04	2.35	-0.57	-7.41	-6.84
1993	4.28	1.73	1.42	-1.51	-11.7	-12.1	-0.76	-3.57	-3.33	-1.16	-3.61	-3.78	0.01	-4.92	1.95	-0.38	-7.47	-6.52
1994	2.03	1.51	0.60	-4.57	-11.9	-13.4	-1.13	-4.47	-4.61	-1.66	-4.64	-5.16	0.04	-3.11	3.96	-0.81	-7.79	-7.57
1995	0.42	0.7	0.24	-1.77	-12.7	-13.2	-0.89	-5.5	-5.38	-1.26	-5.65	-5.88	0.02	-4.09	10.73	-0.41	-6.81	-5.92
1996	-0.64	-0.38	-0.66	-1.20	-13.6	-13.7	-0.88	-6.14	-6.01	-1.23	-6.29	-6.50	0.02	-3.97	10.96	-0.31	-6.29	-5.12
1997	-1.10	-0.7	-1.17	-3.01	-12.6	-13.7	-1.53	-8.03	-8.45	-1.13	-6.19	-6.31	0.02	-3.58	1.88	-0.61	-6.13	-5.64
1998	-1.29	-1.91	-2.27	-1.29	-12.9	-13.2	-1.85	-6.82	-7.44	-1.13	-5.13	-5.26	0.02	-3.82	3.50	-0.27	-7.82	-6.53
1999	-0.98	-1.26	-1.49	-2.37	-13.1	-13.9	-1.92	-7.6	-8.26	-2.69	-6.14	-7.13	0.03	-3.65	10.13	-0.49	-6.81	-6.10
2000	-0.76	-2.05	-1.93	-1.63	-13.4	-13.8	-2.68	-7.12	-8.10	-3.99	-7.24	-8.62	0.08	-2.48	11.23	-0.27	-5.02	-3.75
2001	-0.93	-1.89	-1.96	-1.48	-13.4	-13.8	-2.39	-7.31	-8.18	-1.35	-7.66	-7.96	0.09	-2.45	5.91	-0.12	-4.5	-2.48
2002	-0.37	-1.56	-1.02	-1.42	-12.6	-12.9	-1.66	-6.5	-7.00	-0.93	-7.12	-7.05	0.15	-1.91	7.62	-0.02	-4.7	-1.18
2003	-0.64	-1.98	-1.73	-1.27	-12	-12.3	-2.09	-7.26	-8.00	-1.70	-6.55	-7.08	0.10	-2.29	11.44	-0.02	-5.51	-1.58

(Table A4.4 continues overleaf)

(Table A4.4 continued)

Year	333			334			343			661			662			663		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	24.46	3.2	err	1.2	0.43	1.52	135	4.91	14.85	-5.58	-6.09	-7.8	-4.90	-2.95	-4.55	-3.29	-5.03	-6.22
1987	28.47	3.35	9.49	1.77	0.76	1.74	134.1	4.9	15.15	-5.27	-7.38	-9.04	-6.77	-2.67	-4.59	-1.95	-5.81	-6.48
1988	19.13	2.95	err	1.67	0.65	2.01	106.3	4.67	12.28	-3.87	-6.44	-7.79	-5.76	-2.43	-4.19	-1.26	-6.62	-6.85
1989	56.69	4.04	17.17	2.86	1.16	2.25	122.3	4.81	12.72	-5.99	-4.01	-5.8	-5.80	-2.76	-4.53	-1.70	-5.37	-5.9
1990	37.06	3.61	err	2.63	1.08	2.21	88.54	4.48	14.57	-11.41	-5.35	-7.79	-6.45	-2.4	-4.28	-4.32	-2.94	-4.41
1991	25.88	3.25	err	1.96	0.78	2.24	91.5	4.52	12.50	-10.70	-7.09	-9.46	-6.91	-2.68	-4.63	-2.26	-5.25	-6.06
1992	31.4	3.45	14.84	1.38	0.46	2.05	88.23	4.48	10.62	-6.97	-6.96	-8.9	-6.87	-8.13	-10.1	-2.01	-7.41	-8.11
1993	31.98	3.47	14.58	1.44	0.59	1.61	112.7	4.73	10.82	-7.40	-6.38	-8.39	-5.49	-6.4	-8.1	-2.79	-6.96	-7.98
1994	33.89	3.52	12.44	1.85	0.65	3.29	144	4.97	11.11	-10.06	-5.88	-8.19	-6.29	-5.89	-7.73	-4.41	-6.43	-7.92
1995	70.58	4.26	err	1.33	0.45	1.86	130.1	4.87	12.28	-10.70	-2.04	-4.42	-10.0	-3.23	-5.54	-4.39	-3.83	-5.31
1996	60.72	4.11	err	1.24	0.29	2.63	66.79	4.2	12.13	-10.95	-2.76	-5.16	-9.05	-1.59	-3.81	-3.60	-2.21	-3.52
1997	24.77	3.21	12.75	1.46	0.43	3.00	84.87	4.44	11.81	-11.11	-0.37	-2.84	-9.82	-2.59	-4.88	-2.20	-3.38	-4.18
1998	20.41	3.02	10.79	1.39	0.43	2.37	129	4.86	9.45	-6.85	-2.82	-4.75	-6.46	-3.6	-5.47	-2.98	-3.62	-4.72
1999	10.43	2.35	err	0.85	0.04	1.68	63.33	4.15	10.36	-3.95	-1.14	-2.59	-5.13	-3.21	-4.85	-1.76	-3.77	-4.34
2000	7.433	2.01	err	0.28	0.09	1.31	27.65	3.32	8.55	-5.15	-5.65	-7.29	-7.89	-4.93	-7	-2.07	-3.85	-4.59
2001	16.06	2.78	10.41	0.7	0.31	2.65	54.67	4	9.28	-4.81	-5.34	-6.91	-4.97	-4.72	-6.33	-1.87	-3.24	-3.89
2002	20.32	3.01	9.92	0.56	0.41	2.03	54.14	3.99	11.49	-6.14	-5.22	-7.03	-3.50	-4.45	-5.71	-2.12	-3.6	-4.37
2003	19.96	2.99	11.86	0.12	1.81	0.53	44.44	3.79	11.27	-4.37	-4.04	-5.52	-3.86	-3.81	-5.17	-1.76	-3.37	-3.96

(Table A4.4 continued)

Year	842			843			845			846		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	-0.89	-4.93	-4.83	-0.49	-5.89	-5.19	-0.02	-7.58	-3.83	-0.03	-7.11	-3.66
1987	-0.8	-4.64	-4.43	-0.58	-5.44	-4.91	-0.03	-8.1	-4.58	-0.08	-5.46	-3.01
1988	-0.37	-5	-4.03	-0.26	-5.13	-3.82	-0.05	-8.65	-5.55	0.12	-0.99	0.39
1989	-0.56	-5.14	-4.58	-0.34	-6.12	-5.05	-0.01	-3.65	-0.4	0.35	-0.41	0.74
1990	-0.45	-3.04	-2.35	-0.24	-2.65	-1.47	0.02	-2.16	0.18	0.08	-0.47	0.14
1991	-0.6	-1.48	-1.3	-0.16	-2.06	-0.83	0.17	-1.59	1.73	-0.24	-1.58	-0.78
1992	-0.32	-5.15	-4.03	-0.16	-2.88	-1.36	0.11	-0.98	0.36	0.11	-0.55	0.22
1993	-0.13	-5.43	-3.44	-0.06	-2.61	-0.6	-0.1	-1.89	-0.51	-0.05	-1.1	-0.13
1994	-0.13	-3.07	-1.34	-0.1	-2.63	-0.86	0.67	0.01	1.09	0.44	-0.1	0.67
1995	-0.09	-3.43	-1.33	0.372	-0.72	1.44	0.42	-0.41	1.01	-0.20	-5.63	-4.02
1996	-0.12	-3.64	-1.7	0.063	-1.9	0.54	0.8	0.05	1.41	-0.13	-3.12	-1.38
1997	-0.04	-0.95	-0.09	-0.19	-1.83	-0.78	0.85	0.18	1.23	0.63	0.14	0.79
1998	0.02	-0.7	0.04	-0.2	-1.56	-0.66	2.98	1.2	2.25	1.73	0.77	1.62
1999	-0.06	-1.05	-0.16	-0.08	-1.97	-0.46	2.84	1.22	1.81	-0.08	-1.01	-0.2
2000	0.75	0.29	0.82	-0.01	-0.79	-0.03	1.89	1.02	1.13	0.29	0.12	0.3
2001	1.16	0.58	1.05	-0.29	-1.54	-0.86	0.74	0.31	0.79	1.69	1	0.98
2002	1.92	0.89	1.56	0.675	0.07	0.99	1.5	0.67	1.45	1.65	0.96	0.99
2003	1.33	0.69	1.10	0.39	0.05	0.46	1.48	0.71	1.28	1.89	1.07	1.04

Source: own calculation

Table A4.5

Brunei's Revealed Comparative Advantage with Respect to ASEAN in the World Market, 1986-2003: The Vollrath Index

Year	011			012			o54			o56			211			243		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	-5.8	-0.03	-1.95	-5.2	-1.63	-3.32	-2.13	-3.65	-4.42	-1.71	-3.41	-3.97	0.32	-4.51	-1.16	-0.22	-8.33	-6.83
1987	-7.5	-0.11	-2.24	-8.0	-2.54	-4.63	-2.64	-3.59	-4.57	-1.96	-3.98	-4.67	1.83	-2.17	4.65	-0.15	-8.86	-6.95
1988	-3.4	1.83	-0.44	-5.6	-1.5	-3.27	-2.72	-1.81	-2.87	-2.04	-2.44	-3.20	1.66	1.57	8.25	-0.31	-8.06	-6.90
1989	-9.2	0.33	-2.03	-8.3	1.45	-1.08	-2.77	-4.01	-5.04	-2.42	-3.3	-4.20	0.60	-1.37	6.61	-0.82	-9.02	-8.82
1990	-10.4	0.55	-1.94	-5.2	1.65	-0.69	-2.93	-3.93	-5.02	-2.95	-3.53	-4.63	1.54	-1.18	5.66	-0.95	-9.63	-9.58
1991	-10.1	-0.13	-2.53	-12.2	0.45	-2.18	-2.68	-3.9	-4.90	-3.59	-3.62	-4.90	2.41	-0.58	2.36	-2.03	-8.42	-9.13
1992	-8.3	-0.05	-2.28	-4.2	-0.23	-1.84	-2.28	-3.92	-4.75	-3.04	-3.6	-4.72	6.28	0.05	5.24	-2.62	-8.2	-9.16
1993	-7.0	0	-2.08	-18.8	-0.39	-3.36	-1.74	-3.62	-4.19	-2.88	-3.52	-4.59	1.34	-1.98	4.61	-2.41	-8.28	-9.16
1994	-11.9	-0.14	-2.68	-58.8	-0.92	-5.00	-2.58	-4.14	-5.10	-4.07	-4.43	-5.84	6.15	-0.19	6.24	-3.17	-8.32	-9.47
1995	-8.7	-0.81	-3.02	-32.2	-1.53	-5.01	-2.05	-4.96	-5.68	-3.63	-5.32	-6.61	3.49	-1.25	12.91	-1.87	-7.22	-7.85
1996	-6.2	-1.61	-3.47	-19.1	-2.63	-5.58	-2.00	-5.69	-6.39	-3.49	-6.03	-7.28	2.25	-1.29	12.96	-1.55	-6.5	-6.94
1997	-6.6	-1.93	-3.84	-46.0	-1.36	-5.20	-3.18	-7.42	-8.58	-3.00	-5.78	-6.88	0.94	-0.79	4.03	-2.99	-6.13	-7.22
1998	-6.2	-3.46	-5.29	-16.5	-1.12	-3.95	-3.97	-5.96	-7.33	-3.32	-4.45	-5.66	1.22	-1.3	5.58	-1.53	-7.6	-8.03
1999	-4.2	-2.76	-4.22	-24.8	-1.39	-4.61	-4.05	-6.84	-8.24	-7.21	-5.48	-7.45	0.40	-1.57	11.94	-2.19	-6.71	-7.50
2000	-2.8	-3.44	-4.46	-16.0	-1.43	-4.22	-5.97	-6.1	-7.89	-10.5	-6.61	-8.96	1.46	-0.6	12.68	-1.28	-5.01	-5.27
2001	-3.5	-3.52	-4.77	-10.9	-0.87	-3.29	-5.03	-6.46	-8.08	-3.51	-6.98	-8.24	1.31	-0.14	7.95	-0.60	-4.38	-3.89
2002	-1.9	-3.27	-3.92	-26.0	1.05	-2.31	-3.55	-5.48	-6.75	-2.46	-6.36	-7.26	2.51	0.36	9.49	-0.14	-4.6	-2.72
2003	-2.7	-3.55	-4.54	-21.6	1.5	-1.76	-4.79	-6.23	-7.80	-4.69	-5.69	-7.24	2.68	0.18	13.55	-0.06	-5.41	-2.66

(Table A4.5 continues overleaf)

(Table A4.5 continued)

Year	333			334			343			661			662			663		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	5.6	1.73	err	0.20	-0.9	0.41	18.3	2.90	9.53	-7.1	-5.55	-7.51	-3.0	-1.34	-2.53	-3.9	-1.12	-2.6
1987	8.7	2.17	err	0.41	-0.5	1.10	19.4	2.97	10.65	-8.0	-6.99	-9.07	-6.2	-1.17	-3.05	-2.4	-2.16	-3.1
1988	14.5	3.42	10.0	18.11	2.94	4.44	-14.3	4.82	-1.49	-23.9	-4.91	-9.88	-87.9	0.82	-3.68	-17.4	-3.23	-6.1
1989	11.7	2.46	err	0.53	-0.3	-0.01	-23.1	3.31	-0.61	-14.0	-3.89	-6.53	-6.6	-1.6	-3.51	-2.5	-3.33	-4.3
1990	12.8	2.55	15.7	0.43	-0.4	1.14	14.0	2.94	1.34	-13.0	-4.89	-7.46	-7.5	-1	-3.05	-6.5	-1.38	-3.3
1991	14.5	2.72	err	0.51	-0.4	1.11	-2.3	3.17	-0.09	-7.9	-6.08	-8.15	-8.9	-1.28	-3.50	-3.5	-3.6	-4.9
1992	28.7	3.05	err	0.47	-0.5	1.36	-18.8	3.07	-0.63	-5.2	-6.09	-7.75	-8.8	-6.88	-9.06	-3.0	-5.37	-6.5
1993	25.1	3.18	14.6	0.42	-0.4	1.68	-72.8	3.38	-1.25	-8.2	-5.66	-7.77	-6.8	-5.14	-7.06	-3.6	-5.05	-6.3
1994	19	3.41	14.3	0.76	-0.2	1.13	30.8	3.65	1.61	-11.0	-5.05	-7.45	-8.4	-4.21	-6.34	-6.1	-4.95	-6.8
1995	16.4	4.41	13.1	0.57	-0.3	2.68	26.7	3.74	1.01	-9.7	-1.18	-3.49	-13.4	-1.5	-4.11	-7.0	-2.24	-4.2
1996	24.6	4.52	err	0.59	-0.4	1.33	15.8	3.47	0.68	-7.7	-1.9	-3.97	-10.5	0.15	-2.31	-5.4	-0.59	-2.4
1997	13.7	3.29	err	0.76	-0.2	2.44	37.8	3.64	6.20	-7.0	0.33	-1.79	-12.0	0.14	-2.43	-2.7	-2.29	-3.3
1998	11.3	3.29	12.8	0.66	-0.3	2.60	53.5	4.03	3.11	-9.7	-2.34	-4.63	-9.0	-0.82	-3.06	-4.1	-2.38	-3.8
1999	18.7	2.93	10.9	0.45	-0.6	1.89	32.9	3.54	3.15	-10.0	-1.03	-3.37	-9.7	-1.04	-3.35	-2.3	-2.88	-3.8
2000	16.9	2.83	err	0.17	-1.5	0.76	15.6	2.76	4.37	-10.0	-5.48	-7.78	-17.1	-2.8	-5.64	-2.8	-3.16	-4.2
2001	29.4	3.38	err	0.49	-0.7	2.17	28.6	3.35	6.59	-8.1	-5.3	-7.40	-10.7	-2.69	-5.06	-2.5	-2.59	-3.5
2002	35.3	3.56	11.3	0.36	-0.9	2.56	27.3	3.31	8.95	-14.5	-5.02	-7.69	-10.0	-2.38	-4.69	-2.9	-2.94	-4.0
2003	36.2	3.59	10.6	-0.05	-2.3	0.87	25.4	3.23	8.62	-11.4	-3.65	-6.09	-7.7	-1.71	-3.78	-2.6	-2.59	-3.6

(Table A4.5 continued)

Year	842			843			845			846		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	-4.71	-5.09	-6.65	-1.52	-6.07	-6.49	-0.12	-7.37	-5.22	-0.1	-7.12	-5.02
1987	-4.47	-4.94	-6.44	-2.74	-5.78	-6.79	-0.12	-8.44	-6.35	-0.3	-5.97	-4.81
1988	-3.67	-4.34	-5.64	-2.18	-4.30	-5.09	-0.3	-8.48	-7.28	-1.2	-0.76	-1.27
1989	-4.53	-5.43	-6.94	-2.27	-6.29	-7.11	-0.15	-3.86	-2.1	-0.7	-0.85	-1
1990	-3.95	-3.39	-4.78	-2.05	-2.84	-3.58	-0.35	-2.53	-1.68	-1.5	-1.12	-1.73
1991	-6.84	-1.72	-3.67	-2.1	-2.08	-2.88	0.01	-1.71	0.04	-1.6	-2.03	-2.6
1992	-2.74	-5.18	-6.19	-1.49	-2.59	-3.04	-0.88	-1.04	-1.25	-1.2	-0.78	-1.3
1993	-1.11	-4.54	-4.65	-0.87	-2.27	-2.24	-1.03	-1.86	-2.03	-1.1	-1.24	-1.59
1994	-1.28	-3.11	-3.39	-1.08	-2.39	-2.54	-0.67	0.03	-0.5	-0.9	-0.31	-0.79
1995	-0.99	-3.26	-3.3	-0.21	-0.40	-0.27	-0.73	-0.39	-0.73	-0.7	-5.77	-5.41
1996	-1.14	-3.22	-3.39	-0.46	-1.50	-1.11	-0.07	0.35	-0.05	-0.6	-3.00	-2.61
1997	-2.75	-0.29	-1.54	-2.44	-1.27	-2.27	-0.12	0.57	-0.07	-0.4	0.45	-0.24
1998	-3.19	-0.14	-1.54	-3.26	-0.99	-2.28	2.69	1.47	0.96	1.04	1.04	0.46
1999	-2.59	-0.63	-1.77	-1.57	-1.59	-2.16	2.37	1.54	0.71	-1.2	-0.67	-1.21
2000	-2.52	0.69	-0.82	-2.99	-0.51	-1.79	0.26	1.37	0.07	-1.8	0.39	-0.79
2001	-2.51	1.05	-0.63	-4.12	-1.20	-2.69	-0.67	0.63	-0.31	-0.6	1.24	-0.15
2002	-0.05	1.12	-0.02	-2.63	0.20	-1.15	-0.04	0.59	-0.02	-1.1	1.20	-0.29
2003	-1.15	0.96	-0.36	-3.81	0.18	-1.43	5.95	2.05	1.44	-1.2	1.24	-0.3

Source: own calculation

Table A4.6: Brunei's Revealed Comparative Advantage with Respect to ASEAN Member Countries in the ASEAN Market, 1986-2003: The Vollrath Index

Year	011			012			o54			o56			211			243		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	4.5	2.05	0.9	-1.1	-0.27	-0.9	-0.68	-1.17	-1.2	-2.27	-1.74	-2.6	0.32	-1.03	2.3	-0.03	-6.32	-3.0
1987	-3.1	1.79	-0.4	-1.6	-1.41	-2.0	-0.80	-1.4	-1.4	-3.15	-2.33	-3.5	1.83	0.61	11.7	-0.02	-7.22	-3.5
1988	5.7	2.54	0.6	-6.2	0.04	-1.9	-0.61	-0.8	-0.9	-3.04	-1.7	-2.9	1.66	0.5	11.7	-0.05	-6.18	-3.2
1989	3.0	2.45	0.3	-13.8	2.37	-2.6	-1.19	-1.65	-2.0	-4.78	-1.2	-2.8	0.60	-0.51	11.9	-0.13	-7.25	-5.2
1990	8.2	2.67	0.8	-25.1	2.12	-1.4	-1.80	-1.6	-2.3	-7.29	-1.35	-3.4	1.54	0.43	13.3	-0.15	-7.96	-6.1
1991	-0.1	2.33	0.0	-61.0	0.74	-5.7	-2.04	-1.61	-2.4	-8.42	-1.44	-3.6	2.41	0.89	4.5	-0.35	-6.66	-5.6
1992	2.3	2.37	0.2	-88.4	0.2	-6.6	-1.86	-1.81	-2.5	-5.65	-1.9	-3.7	6.28	1.84	6.4	-0.45	-6.65	-5.9
1993	-3.6	2.39	-0.3	-44.5	0.09	-6.0	-1.77	-1.76	-2.4	-7.64	-1.71	-3.8	1.34	0.29	11.9	-0.46	-6.42	-5.7
1994	-8.8	2.13	-0.7	-98.4	-0.65	-7.6	-2.05	-2.47	-3.2	-4.78	-2.75	-4.3	6.15	1.82	6.7	-0.62	-6.73	-6.3
1995	-6.8	1.62	-0.8	-84.9	-1.07	-5.5	-1.90	-3.37	-4.0	-5.28	-3.55	-5.2	3.49	1.25	13.3	-0.36	-5.49	-4.5
1996	-11.0	0.7	-1.9	-60.2	-2.1	-6.2	-2.11	-4.04	-4.8	-6.33	-4.07	-5.9	2.25	0.81	12.6	-0.34	-4.95	-3.9
1997	-20.3	0.31	-2.8	-31.4	-0.46	-6.2	-2.31	-5.84	-6.7	-5.64	-3.79	-5.5	0.94	0.06	12.1	-0.74	-4.37	-4.1
1998	-18.4	-0.64	-3.6	-15.4	0.42	-4.6	-2.87	-3.91	-5.0	-6.67	-2.19	-4.1	1.22	0.2	12.5	-0.46	-5.34	-4.6
1999	-14.8	-0.6	-3.3	-21.9	-0.31	-8.0	-3.68	-5.54	-6.8	-11.5	-4.05	-6.5	0.40	0.93	11.2	-0.73	-5.08	-4.8
2000	-20.1	-0.89	-3.9	-23.6	-0.06	-3.3	-4.85	-4.8	-6.4	-16.9	-4.84	-7.7	1.46	0.38	12.4	-0.43	-3.17	-2.4
2001	-25.1	-0.52	-3.8	-7.9	0.15	-2.1	-3.55	-4.89	-6.2	-6.63	-4.93	-6.8	1.31	0.27	12.6	-0.19	-4.21	-2.6
2002	-19.3	-0.29	-3.3	-21.3	0.89	-6.8	-2.65	-4.13	-5.1	-7.31	-4.5	-6.5	2.51	0.92	13.0	0.02	-2.64	0.3
2003	-17.5	-1	-3.9	-53.4	2.1	-4.2	-3.47	-4.68	-5.9	-16.4	-3.53	-6.3	2.68	0.99	13.0	0.00	-3.77	0.0

(table A4.6 continues overleaf)

(Table A4.6 continued)

Year	333			334			343			661			662			663		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	43.7	3.78	err	-0.1	-3.3	-1.3	0	Err	Err	-9.7	-4.8	-7.1	-9.3	-0.6	-2.9	-10.3	-2.4	-4.8
1987	60.2	4.1	err	0.1	-1.6	0.4	0	Err	Err	-8.7	-6.3	-8.5	-5.3	-0.6	-2.4	-6.1	-3.6	-5.4
1988	57.0	4.04	err	0.2	-1	0.8	0	Err	Err	-9.5	-4.9	-7.2	-8.4	0.4	-1.9	-5.6	-4.0	-5.7
1989	85.5	4.45	err	-0.1	-3.6	-1.5	0	Err	Err	-9.5	-3.1	-5.4	-7.7	-0.6	-2.7	-4.5	-3.1	-4.6
1990	72.8	4.29	err	-0.1	-4.3	-2.2	0	Err	Err	-11.1	-4.3	-6.7	-16.1	-0.1	-2.9	-14.8	-1.5	-4.2
1991	42.8	4.89	err	-0.1	-3.7	-1.4	0	Err	Err	-16.5	-5.7	-8.5	-18.9	-0.4	-3.4	-6.3	-3.3	-5.2
1992	29.7	8.00	err	-0.1	-3.2	-0.8	0	Err	Err	-7.5	-5.7	-7.7	-20.4	-6.4	-9.4	-6.8	-5.8	-7.7
1993	21.5	9.98	20.7	-0.3	-4.8	-3.5	-0.02	Err	Err	-30.1	-5.1	-8.5	-17.8	-4.5	-7.4	-8.8	-5.3	-7.5
1994	21.4	7.66	16.9	0.1	-1.9	1.7	0	Err	Err	-18.3	-4.7	-7.6	-13.1	-4.1	-6.7	-9.1	-5.0	-7.2
1995	63.8	5.58	err	0.1	-1.9	0.6	0	Err	Err	-12.7	-0.7	-3.3	-8.2	-1.3	-3.5	-6.0	-2.2	-4.0
1996	79.8	5.94	err	0.1	-1.9	1.3	0	Err	Err	-18.0	-1.5	-4.4	-9.6	0.3	-2.1	-6.3	-0.4	-2.3
1997	87.9	4.68	13.6	0.1	-1.8	1.6	0.01	-7.5	-1.7	-10.4	0.7	-1.8	-14.4	-0.6	-3.3	-3.5	-1.4	-2.7
1998	99.6	4.63	11.2	0.2	-1.5	1.5	-0.05	-7.2	-4.3	-15.5	-1.2	-4.0	-10.2	-1.0	-3.4	-2.8	-1.3	-2.4
1999	17.5	2.86	err	0.0	-2.6	0.8	0.00	-7.5	-2.0	-24.9	-0.1	-3.3	-19.1	-1.5	-4.4	-3.4	-2.4	-3.6
2000	16.1	2.78	err	0.0	-3.4	0.8	-0.01	-8.2	-4.0	-10.3	-4.5	-6.8	-12.0	-3.1	-5.6	-2.7	-2.3	-3.3
2001	52.5	3.96	11.6	0.2	-1.5	2.5	-0.01	-8.3	-3.8	-6.6	-4.1	-5.9	-10.8	-2.7	-5.0	-4.3	-1.4	-2.9
2002	72.7	4.29	10.3	0.0	-3.1	0.1	0.00	-6.5	2.2	-12.3	-3.8	-6.3	-10.8	-2.2	-4.6	-8.0	-1.7	-3.8
2003	48.5	3.88	11.5	0.1	-2	0.5	2.35	0.9	7.3	-6.1	-2.4	-4.2	-9.3	-1.3	-3.6	-5.0	-1.2	-2.9

(Table A4.6 continued)

Year	842			843			845			846		
	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC	RTA	RXA	RC
1986	-3.8	-3.0	-4.3	-1.2	-3.8	-3.9	0.0	-3.5	-0.6	-0.1	-4.6	-2.1
1987	-3.2	-2.6	-3.8	-1.6	-3.4	-3.9	0.0	-3.1	-0.2	-0.1	-2.9	-1.2
1988	-1.9	-1.2	-2.0	-1.1	-1.9	-2.1	0.0	-2.6	-0.4	-0.4	-0.6	-0.6
1989	-2.5	-3.0	-3.9	-1.2	-3.4	-3.6	0.0	-4.7	-1.8	-0.6	-2.4	-2.0
1990	-1.9	-1.9	-2.6	-0.8	-1.2	-1.3	-0.1	-4.1	-2.1	-0.6	-0.8	-0.8
1991	-5.4	-2.4	-4.1	-1.6	-2.5	-3.0	-0.1	-7.3	-4.5	-1.1	-3.1	-3.3
1992	-1.9	-5.2	-5.8	-1.3	-4.7	-5.0	-0.1	-1.2	-0.4	-1.0	-2.7	-2.8
1993	-0.9	-4.3	-4.2	-0.9	-4.4	-4.3	-0.4	-1.7	-1.2	-1.0	-6.0	-6.0
1994	-0.8	-3.4	-3.3	-0.7	-1.8	-1.7	1.2	0.5	1.3	2.9	1.3	1.7
1995	-0.8	-4.0	-3.8	-0.6	-1.6	-1.3	0.0	-0.9	0.1	-0.3	-4.3	-3.3
1996	-1.0	-4.5	-4.4	-0.6	-1.9	-1.7	0.5	0.0	0.8	-0.3	-4.2	-3.1
1997	-1.5	0.1	-0.8	-2.7	-1.9	-3.0	-0.5	-1.4	-1.1	-0.4	-0.7	-0.6
1998	7.4	2.3	1.5	1.4	1.3	0.5	4.5	1.7	2.0	0.8	0.5	0.7
1999	0.2	0.8	0.1	-0.4	0.1	-0.3	2.9	1.3	1.6	-0.7	-2.2	-2.0
2000	6.5	2.3	1.1	0.8	1.3	0.2	2.0	1.2	0.9	-1.6	-1.8	-2.3
2001	24.5	3.3	2.1	2.3	1.8	0.5	0.1	0.0	0.1	22.6	3.2	2.4
2002	15.7	3.0	1.4	6.8	2.4	1.0	1.3	0.9	0.8	20.7	3.2	2.0
2003	14.2	2.9	1.4	3.6	2.2	0.5	1.2	1.6	1.9	45.4	3.9	2.6

Source: own calculation

CHAPTER 5

EXPORT COMPETITIVENESS

5.1 Introduction

In the last chapter, we identified a number of potential product categories and markets for Brunei's non-oil exports. Following our findings, we now focus our analysis on each of the identified products and markets. Before we proceed, first we will present the types of production incentives available in Brunei as part of the export-promotion strategy. We will then look at the export performance of each of the previously identified products since the introduction of the export incentives. In order to strengthen our analysis and to help shed some light on Brunei's performance in the world market, we will also look at Brunei's export competitiveness in each of the product categories and in each market vis-à-vis a group of selected ASEAN member countries, which are Brunei's close competitors in these markets. Our main results are derived from the use of shift-share analysis.

The remaining sections of the chapter are as follows. Section two will give some background on Brunei's production and export incentives. Section three will evaluate the performance of Brunei's non-oil exports. Section four will discuss the data and methodology used, which is then followed by our empirical results. Section six concludes.

5.2 Production and Export Incentives

Before we present the types of production incentives in Brunei, we first give an overview of Brunei's trade policy in relation to its diversification strategy. It was only in the Fifth National Development Plan (1986-90) that the Brunei government announced its adoption of export-oriented industrialization and import-substitution industrialization as the strategies for the economic diversification policy. Two industries were identified in the National Development Plan to be developed as export-oriented. These were potteries and tiles, and glass. These industries were chosen because of the availability of the natural resources that are used in their production. Brunei has a number of areas containing suitable deposits of clay and large deposits of high quality silica sands which could be utilized in the production of pottery and glass. In the Seventh National Development Plan (1996-2000), oil and gas downstream industries were also proposed for development.

In 1996 the Brunei government established the Brunei Industrial Development Authority (BINA) within the Ministry of Industry and Primary Resources to enhance the role of the ministry in the coordination and the development of non-oil investment activities in Brunei. Under BINA, a number of industrial estates have been established as the centres for industrial development. In 2000, a total of 705 hectares had been allocated for the industrial sites. In 2001, Brunei issued two decrees, the Investment Incentives Order 2001 and Income Tax (Amendment) Order 2001 that contained reforms in the form of production and export incentives to attract investments. These acts are administered by the Ministry of Industry and

Primary Resources. The incentives are mainly in the form of tax exemptions to different 'types' of industries. Industries are identified in terms of the length of their establishment. Table 5.1 summarises the types of incentives available.

Table 5.1: The Investment Incentives

Type of companies	Incentives
1. Pioneer industries A firm is given a pioneer status if it engages in an industry previously not carried out in Brunei on a commercial scale.	• Exemption from paying the 30% corporate tax between 5 to 11 years, depending on the amount of fixed capital. • Exemption from paying import duties on raw materials, machinery, equipment, component parts, accessories and building structure.
2. Pioneer Services companies.	• Exemption from paying the 30% corporate tax for 8 years subject to a further extension of up to 3 years, depending on the amount of fixed capital.
3. Post-pioneer companies.	• Exemption from paying the 30% corporate tax for 6 years subject to a further extension of up to 5 years.
4. Expansion of established enterprises. Any existing company intending to incur new capital expenditure for the purpose of expansion in production.	• Exemption from paying the 30% corporate tax: o 3 years for capital expenditure of up to B$1 million; and o 5 years for capital expenditure of more than B$1 million.
5. Expansion of service companies.	• Exemption from paying the 30% corporate tax for 5 years subject to a further extension.
6. Companies producing for export.	• Exemption from paying the 30% corporate tax up to 15 years subject to the amount of fixed capital expenditure. • Exemption from paying import duties on raw materials, machinery, equipment, component parts, accessories and building structure.
7. Companies offering services for export.	• Exemption from paying the 30% corporate tax for 11 years subject to further extensions of up to 20 years in total. • Exemption from paying import duties on raw materials, machinery, equipment, component parts, accessories and building structure.
8. International trade incentive. Any company which is engaged in entrepot trade expecting export sales of more than B$5 million.	• Exemption from paying the 30% corporate tax for 8 years.
9. Companies engaged in new technology.	• Exemption from paying the 30% corporate tax. • Capital allowances which remain unabsorbed at the end of the tax relief period may be applied against post pioneer profit.

Source: Ministry of Industry and Primary Resources (2004).

The Ministry has also provided a list of preferred industries, associated activities and products to be developed (see Table A5.1 in the Appendix for the full list). However, the list lacks other information necessary for would-be producers and investors such as the availability of resources to produce and the analysis of the industries themselves in terms of the demands within and outside Brunei and the competition they face from around the region. To date, the Ministry has granted the pioneer status to a number of industries listed in Table 5.2.

Table 5.2

Pioneer Status Industries, 2003

Industries	Products
Aircraft catering services	Various types of food for airlines
Cement Finish Mill	Cement
Industrial chemical	Various types of chemicals for oil and other industries
Textile	Various types of clothing
Canning, bottling and packaging	Various types of canned, bottled and packaged for food.
Sheet metal-forming	Roofing, walling, fencing, roof trusses, frames, fitting and fixtures and containers for storage.
Manufacture of electrical industrial machinery and apparatus	Electrical industrial apparatus including the manufacture and renovation of electric motors, generators, transformers, switchgear and switchboard, rectifiers, electrical transmission equipment, electro-magnetic clutches and brakes and electrical welding apparatus.
Supporting services to water transport	The provision of services to all kinds of water transports and ship leasing.
Food manufacturing.	Slaughtering, preparing and preserving halal meat.
Related waste industry.	Environment products and services, oily waste treatment and recycling and inorganic hazardous waste material disposal other services.
Manufacture of non metallic mineral products.	Miscellaneous non-metallic mineral products such as concrete, glass fibre insulation products, mineral wool, slate products, cut-stone products, abrasives, graphite products, silica and other products except asbestos.
Shipyard	Ship repair and maintenance.

Source: Ministry of Industry and Primary Resources (2003).

Information regarding how much has been produced by the pioneer industries in terms of value and quantity would be useful for this study to determine their achievements and their contributions toward the diversification policy. Unfortunately, such information is not available. Moreover, industries such as 'potteries and tiles', 'glass', 'furniture' and 'plywood and wood panelling' which were mentioned in the National Development Plans as early as the 1980s have not yet been established.

Another sectoral incentive for producers is the agricultural input incentive from the Department of Agriculture. Agricultural input products such as equipment, seeds and seedlings, fertilizers and other chemical inputs are provided to local farmers at a subsidized price. However, according to the Department (2002), the current market prices of the inputs available from the private enterprises are already at competitive rates. As a result, the local farmers do not make use of the available incentives and the Department is in the process of privatizing the service[32]. The Department also grants plots of land to farmers with viable agricultural development proposals.

Besides the above mentioned incentives, Brunei also does not impose any export tax, sales tax or income tax. Despite Brunei's efforts in providing various tax incentives including those listed in Table 5.1, progress in achieving the diversification goal is still limited according to Cleary and Wong (1994). They argue that these fiscal benefits cannot be fully utilized and in some ways are

[32] As explained by an officer at the Agriculture Department, Ministry of Industry and Primary Resources.

irrelevant to the present structure of the manufacturing industry. This is because most of the manufacturing industries are small and oriented towards the domestic market.

However, we find that the 'small market' argument is no longer relevant especially in the light of globalisation. The recent Doing Business in Brunei report by the World Bank (2007) has produced some indicators on the business environment in Brunei and their rankings based on a total of 178 economies. The summary is given in Table 5.3.

Table 5.3: Brunei's Ranking in Doing Business

Indicator	Rank
Employing workers	4
Paying taxes	28
Closing a business	35
Trading across borders	36
Dealing with licenses	66
Ease of doing business	78
Getting credit	97
Starting a business	117
Protecting investors	121
Enforcing contracts	158
Registering property	178

Source: The World Bank, 2007

The report investigates which business regulations enhance business activity and those that constrain it in the 178 economies. The summary from table 5.3 shows that Brunei is doing extremely well in the area of employing workers which measures workers' protection where Brunei is ranked 4th out of 178. Brunei is also doing reasonably well in the area of 'paying taxes' (ranked 28th) which indicates that Brunei's tax rates are relatively low and the available tax procedures are simple compared with 150 other economies which had lower ranks. However Brunei's performance in a number of areas is poor such as 'registering property'

(ranked 178th), 'enforcing contracts' (ranked 158th), 'protecting investors' (ranked 121st) and 'starting a business' (ranked 117th) to name a few. It is not the scope of this study to look into those areas but it seems to suggest that Brunei to make efforts beyond the provision of tax incentives alone and to start concentrating in other areas, as suggested by the World Bank's report, in order to entice new investors and producers coming to Brunei.

5.3 Export Performance

In the previous chapter, we have identified a number of commodities which have high potential to be exported in a number of different markets. The commodities and the relevant markets are listed in Table 5.4 which show that none of the proposed industries in the national development plans are included in the list.

Table 5.4

Brunei's Realistic Export Opportunities

SITC	Commodity	Potential Markets
03	Fish, crustacean and molluscs	Japan, UK, US, EU
07	Coffee, tea, cocoa, spices	Malaysia, Thailand, Japan, UK, US, EU
21	Hides, skins and fur skins, raw	Singapore, Korea, US, EU
25	Pulp and waste paper	Japan, Korea, UK, US, China,EU
27	Crude fertilizer and crude minerals	Japan, China
28	Metalliferous ores and metal scrap	Japan, Korea, China, UK, US, EU
62	Rubber manufactures	China, UK, US, EU
65	Textile yarn, fabrics, made-up articles	Hong Kong, Japan, China, UK, US, EU
67	Iron and steel	Korea, China, US
69	Manufactures of metals	Hong Kong, Japan, China, UK, US, Australia
84	Articles of apparel and clothing accessories	Singapore, Japan, Korea, UK, US, Australia, EU
87	Professional, scientific, controlling instruments	Japan, Korea, China, UK, US, EU

Sources: Own calculations

Out of the 60 realistic product/market opportunities, we have also identified 20 product/market combinations which comprise 10 products to 20 markets, considered to be the most promising with export potential. These are:

- Coffee, tea, cocoa, spices to Malaysia and Thailand
- Hides, skins and furskins to Singapore
- Pulp and paper to China
- Crude fertilizer and crude minerals to China
- Metalliferous ores and metal, scrap to China
- Rubber manufactures to China
- Iron and steel to China
- Manufactures of metals to Australia, China, Japan, UK and US
- Articles of apparel and clothing accessories to Australia, Singapore, Korea, UK, US and the EU.
- Professional, scientific, controlling instruments to China.

In this section, we look at the performance of each of the commodities in terms of their shares in Brunei's exports since the export incentives were put in place in 1991. In turn, we also look at the export shares of each of the markets we have identified. We only report the commodity and market combinations of the most promising opportunities.

In addition, we have also included ASEAN as one of the markets. This is mainly for two reasons. Firstly, ASEAN has been Brunei's main non-oil trading partner and secondly, in 1992 ASEAN announced the formation of the ASEAN Free

Trade Area (AFTA) by the year 2003. Therefore, it is interesting to analyse the development in Brunei's exports to the ASEAN market. Table 5.5 shows the shares of 'coffee, tea, cocoa, spices'; 'hides, skins and furskins'; 'pulp and waste paper'; 'crude fertilizer and crude minerals'; 'metalliferous ores and metal'; 'rubber manufactures'; 'iron and steel'; 'manufactures of metals'; 'articles of apparel and clothing accessories' and 'professional, scientific, controlling instruments' in Brunei's total non-oil exports.

What we can see from this Table is that Brunei's non-oil exports are dominated by the export of 'articles of apparel and clothing accessories' since 1991. While the 'manufactures of metals' had a considerable share of about 10-20 % in the early 1990s, this share shows a declining trend in recent years. The rest of the commodities do not seem to hold any substantial share in total non-oil exports.

Table 5.5

The Share of Each Commodity in Brunei's Total Non-Oil Exports (percent).

Commodity	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Fish, crustacean and molluscs	0.35	0.25	0.24	0.13	0.08	0.08	0.02	0.12	0.11	0.08	0.18	0.13	0.17
Coffee, tea, cocoa, spices	0.08	0.09	0.07	0.03	0.02	0.01	0.01	0.02	0.02	0.01	0.10	0.06	0.07
Hides, skins and fur skins, raw	0.40	0.30	0.03	0.13	0.03	0.03	0.04	0.02	0.05	0.03	0.10	0.13	0.08
Pulp and waste paper	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03
Crude fertilizer and crude minerals	0.01	0.02	0.09	0.08	0.09	0.08	0.07	0.09	0.12	0.09	0.14	0.04	0.12
Metalliferous ores and metal scrap	0.92	0.37	0.43	0.78	0.76	0.70	0.48	0.82	1.03	0.72	0.21	0.21	0.42
Rubber manufactures	0.75	0.72	0.84	0.42	0.53	0.49	0.38	0.54	0.72	0.50	0.23	0.13	0.41
Textile yarn, fabrics, made-up articles	0.80	1.16	0.93	0.91	0.73	0.68	0.74	0.56	0.99	0.69	16.28	6.42	0.78
Iron and steel	2.51	2.87	3.28	4.10	3.96	3.67	2.86	4.01	5.37	3.75	1.41	0.98	1.23
Manufactures of metals	19.99	16.41	20.74	14.24	10.24	9.49	9.65	8.42	13.89	9.70	4.75	3.31	10.24
Articles of apparel and clothing accessories	39.27	35.51	11.21	31.37	45.32	42.01	27.30	50.62	61.46	42.93	54.40	59.55	56.63
Professional, scientific, controlling instruments	8.65	6.72	5.21	2.83	2.29	2.13	2.09	1.94	3.11	2.17	0.80	0.96	1.18
Total	73.76	64.44	43.09	55.01	64.07	59.38	43.65	67.17	86.88	60.68	78.60	71.97	71.37

Source: Own Calculation

If we now look at Table 5.6, ASEAN appears to be Brunei's main non-oil exports destination, with the exception of 'articles of apparel and clothing accessories (SITC 84)'. The latter's main destination appears to be the US. Relationship with China, on the other hand, is weak. However, in light of the current progress towards the ASEAN-China Free Trade Area[33], we should expect the relationship to change.

What we can conclude from the two Tables is that the structure of non-oil exports in Brunei has not undergone any major changes over the years. Besides ASEAN, Brunei has yet to penetrate into other markets especially in those markets where the opportunity to export is available. Now, the question of whether or not Brunei is able to compete with other exporting countries is what we will address in the coming sections.

[33] ASEAN-China Free Trade Area is scheduled to take effect from 2010.

Table 5.6

The Export Share of Various Commodities to Selected Countries (percent)

	07			21		25		27		62		67	
	Malaysia	Thailand	ASEAN	Singapore	ASEAN	China	ASEAN	China	ASEAN	China	ASEAN	China	ASEAN
1991	86.02	0.00	99.19	17.59	100.00	0.00	98.19	0.00	83.78	0.00	83.34	0.00	98.67
1994	56.69	0.00	63.81	8.62	100.00	0.00	53.70	0.00	100.00	0.00	80.66	0.00	99.97
1997	40.63	0.00	90.42	11.89	70.28	0.00	32.57	0.00	91.94	1.16	52.03	0.00	98.39
2000	55.01	0.00	94.56	10.81	84.88	0.00	78.28	0.00	92.62	1.04	52.98	0.00	99.29
2001	99.87	0.00	99.87	19.68	51.61	0.00	90.52	25.05	74.82	0.24	89.88	0.42	83.66
2002	98.69	0.00	99.81	17.29	50.54	0.00	100.00	0.00	95.22	1.40	76.20	0.31	99.23
2003	98.97	0.00	99.67	9.72	61.52	0.00	100.00	0.00	99.72	0.68	38.76	0.20	97.63

	69						84							87	
	Aus	Japan	China	UK	US	ASEAN	Singapore	Aus	Korea	UK	US	EU	ASEAN	China	ASEAN
1991	0.03	0.01	0.00	0.96	0.38	98.04	2.17	0.24	0.00	4.95	69.58	18.94	2.83	0.00	59.70
1994	0.25	0.16	0.00	1.21	0.81	97.13	10.46	0.31	0.00	2.59	85.24	0.20	12.66	0.00	46.58
1997	1.25	0.32	0.05	0.33	0.33	96.91	3.07	0.05	0.00	0.40	95.16	0.23	3.47	0.00	26.30
2000	0.80	0.30	0.03	1.21	0.81	96.22	5.56	0.03	0.00	0.22	92.09	0.27	6.55	0.00	29.18
2001	2.35	0.06	3.67	1.09	0.75	88.85	53.09	0.00	0.00	0.30	44.58	0.24	53.29	0.00	61.40
2002	2.11	0.17	0.01	2.55	0.98	93.01	27.99	0.00	0.00	0.53	69.84	0.06	28.21	0.00	47.28
2003	0.41	0.01	0.07	0.29	0.27	96.72	28.69	0.00	0.00	0.61	68.41	0.02	29.06	0.00	63.79

Source: Own Calculations.

Definitions:
07: Coffee, Tea, Cocoa and Spices;
21: Hides, Skins and Furskins
25: Pulp and Paper
27: Crude Fertlizers and Crude Minerals
62: Rubber Manufactures
67: Iron and Steel
69: Manufactures of Metals
84: Articles of Apparel and Clothing
87: Professional, Scientific and Controlling Instruments

5.4 Methodology and Data

We use the shift-share analysis to examine Brunei's non-oil export competitiveness. Shift-share analysis has been used extensively to analyse differences in regional and national growth rates for issues such as employment, labour productivity, export growth and export competition. For example, it has been used in the studies of regional employment growth in the United Kingdom (Thirlwall, 1967), employment growth in New England (Barff and Knight, 2001), labour productivity analysis (Fagerberg, 2000 and Andrikopoulos et. al, 2001), export market growth (Khalifah, 1996 and Peh and Wong, 1999), effects of NAFTA on other countries (Krueger, 1999) and export competitiveness (Herschede, 1991; Wilson, 2000, and the Monetary Authority of Singapore, 2002).

In this thesis, we follow the version of a dynamic shift-share analysis used in Wilson et al (2005) in their assessment of Singapore's export competitiveness. This shift-share version utilises the national growth methodology of Esteban-Marquillas (1972) and combines it with the dynamic version of Barff and Knight (1988).

The shift-share analysis compares changes in a country's exports with the corresponding exports of a selected group of reference economies. As shift-share analysis has always been associated with the differences between regional and national performance, in this version the 'region' refers to each competing country

(in this case Brunei and each of its competing partners) while the 'nation' refers to the combined group of the competing countries. The difference between a country's export performance of a particular commodity to a certain destination and the share effect, that is the total change in exports that is due to the rate of export growth of the reference group as a whole, is referred to as the 'export differential' or 'shift effect'. A positive net shift implies an improvement in competitiveness for the country relative to the reference group while a negative effect constitutes deterioration in competitiveness. The export differential in turn can be further decomposed into three additive factors: the industry mix effect (IME), the competitive effect (CE) and the interaction effect (IE).

Following Esteban-Marquillas (1972) we can represent the different sources of net shifts as follows:

$$de_{ij} = s_{ij} + m_{ij} + c_{ij} + a_{ij} \qquad (5.1)$$

Where de = export growth;

i = export category;

j = a competing country;

s = share effect or the national growth component;

m = industry-mix effect;

c = competitive effect; and

a = interaction term.

Equation 1 implies that each country has a standard growth component given by s_{ij} to which must be added the positive or negative contributions due to the industry mix, the competitive effect and the interaction term. S_{ij} represents the change in exports of a competing country which would have occurred if its export structure

had been equal to the reference group (homothetic exports e'_{ij}) and its exports had grown at the corresponding group rate (r_{io}). This can be represented as:

$$s_{ij} = e'_{ij} r_{i0} \qquad (5.2)$$

and $$e'_{ij} = \frac{e_{i0} \cdot e_{0j}}{e_{00}} \qquad (5.3)$$

where r_{i0} = growth of exports of commodity i of the reference group;

e_{i0} = exports of commodity i from the reference group 0;

e_{oj} = total exports from a competing country, j; and

e_{00} = total exports from the reference group, 0.

Any difference between the actual change in exports of commodity i of a competing country, j, and the share effect, s_{ij}, represents the net shift or export differential, ed_{ij}, which is given by:

$$ed_{ij} = de_{ij} - s_{ij} = e_{ij} r_{ij} - e'_{ij} r_{i0} \qquad (5.4)$$

A positive value for the net shift or export differential implies an improvement in the competing country j's competitiveness of commodity i relative to the reference group, and vice versa. The export differential is in turn accounted for by three components m_{ij}, c_{ij} and a_{ij}.

The industry mix effect, m_{ij}, shows how much of the export differential is due to a divergence between the competing economy's economic structure and the reference group. It will be positive if the country's export share of fast growing industries is larger, or its share in slow growing industries is smaller, compared to the share of the reference group. On the other hand, the mix effect will be negative

if the competing country's economy is dominated by slow growing industries and has few of fast growing ones. Hence, the mix effect is given by:

$$m_{ij} = r_{i0}\left(e_{ij} - e_{ij}^{'}\right) \qquad (5.5)$$

The competitive effect, c_{ij}, shows how much of the export differential is due to a difference between the export growth of the competing country and the group as a whole. In other words, it captures the contribution due to the special dynamism of that sector in the individual country compared with the growth of that sector at the reference group level. The effect is positive if the country's growth exceeds the rate for the group, implying a country has competitive advantage in the product. The competitive effect is given by:

$$c_{ij} = e_{ij}^{'}\left(r_{ij} - r_{i0}\right) \qquad (5.6)$$

The interaction term, a_{ij}, shows how much of the export differential is attributable to a combination of the industry mix effect and the competitive effect i.e. the combination of economic structure and competitiveness. It is given by:

$$a_{ij} = \left(e_{ij} - e_{ij}^{'}\right)\left(r_{ij} - r_{i0}\right) \qquad (5.7)$$

It will be positive if the competing country is specialized ($e_{ij} - e^{'}_{ij} > 0$) in those sectors of faster growth ($r_{ij} - r_{i0} > 0$), or if it is not specialized ($e_{ij} - e^{'}_{ij} < 0$) in sectors in which it lacks competitive advantage ($r_{ij} - r_{i0} < 0$). Conversely, it will be negative if the competing country specialises in exports in which it does not enjoy a competitive advantage or if it does not concentrate on exports in which it has competitive advantage.

From equations 5.4 to 5.7, the net shift or export differential is now given by:

$$ed_{ij} = de_{ij} - s_{ij} = r_{i0}\left(e_{ij} - e_{ij}^{'}\right) + e_{ij}^{'}\left(r_{ij} - r_{i0}\right) + \left(e_{ij} - e_{ij}^{'}\right)\left(r_{ij} - r_{i0}\right) \qquad (5.8)$$

Appendix C5 gives the mathematical exposition of the shift-share formula.

The role of shift-share analysis in this study is to compare Brunei's export performance of the product groups which we have identified in the previous chapter, with that of other ASEAN member countries, which are deemed to be Brunei's close competitors in the region. This will give a more realistic scenario of the development of Brunei's non-oil exports in terms of their competitiveness in an ever-more competitive global market. These countries are Malaysia, Singapore, Thailand, Indonesia and the Philippines. We apply the shift-share analysis to the export growth of each commodity type of each competing country. The combined export growths of these countries make up the reference group for the shift-share study. The destination markets chosen for the analysis are the potential markets corresponding to the potential products which we have identified in the previous chapter. These markets are Japan, Korea, China, Hong Kong, Australia, UK, US, Malaysia, Thailand and the EU. We have also included ASEAN as the destination market for all of the product categories because of its importance as one of the main destinations of Brunei's total non-oil exports.

We use the United Nation's Standard International Trade Classification (SITC) revision 3 at the 2 digit level for the classification of the different commodities for the years 1991 to 2003. Our use of 2-digit level gives a general picture of still very broad categories and hence allows us to measure the industry-mix effect. For

example, 'manufactures of metals (SITC 69)' can be further disaggregated into 9 categories at the 3-digit level, which in turn can be further decomposed into 4-digit and 5-digit, respectively. Our data source is from the United Nations Commodity Trade Statistics Database COMTRADE, available from their website. The year 1991 is chosen as the initial year to correspond with the year Brunei introduced the production and export incentives in order to assess the effects of those incentives.

In the section that follows, the shift-share results are discussed. Before going on to these findings, however, some clarifications need to be made. First, the shift-share technique tells us the dollar amount of the effects just described. Second, the technique is not a causal analysis and does not, in itself, identify the reasons behind any change in a country's performance as measured by the export differential. For example, it will show that a certain export commodity of a competing country had a significant gain in a particular market because of the competitive effect, but it does not tell us what competitive factors accounted for the competitive advantage and how these factors might have changed over the years. Finally, the results must be interpreted with care. A negative export differential within a broad category, for example, need not signify an *overall* loss of competitiveness.

Despite these qualifications, however, the shift-share analysis is still a useful tool for assessing broad changes in a country's performance in the markets where it competes.

5.5 Results

The objectives of the shift-share analysis in this study are to assess Brunei's non-oil export performance relative to other ASEAN countries and to identify sectors in which Brunei has competitiveness. While the method is not the perfect tool to evaluate the effectiveness of the export incentives, some conclusions can be drawn through the export performance results.

In section 5.5.1 we begin by looking at the overall export differential for each commodity. This will then be followed with the results of export differentials for each competing country in each market. In section 5.5.2 we look at the decomposition of the export differentials. We only report results which are available for Brunei.

5.5.1 The Export Differential

We start of with the results of the export differential or net shift for Brunei and its main competitors' exports for 12 broad commodities in the global market. For ease of interpretation, we report the average rates of the export differential over the whole period, from 1991 to 2003. A positive net shift implies an improvement in the *overall* competitiveness of each commodity type relative to the reference group while a negative effect signals deterioration in competitiveness. Table 5.7 provides the results for each of the competing countries. The full shift-share results (in dollar terms) are listed in Tables A5.2-A5.4 in the Appendix.

Table 5.7

The Net Shift Effect for Brunei and its Competitors' Global Export of Various Types of Commodities, 1991-2003 (US$ Million)

	Brunei	Malaysia	Singapore	Philippines	Indonesia	Thailand
Fish, crustacean and molluscs (03)	0.09 (-0.15)	-34.83 (-0.12)	-88.01 (-0.17)	-2.50 (-0.01)	13.75 (0.01)	144.73 (0.04)
Coffee, tea, cocoa, spices (07)	-0.01 (-0.88)	-9.06 (-0.03)	-7.98 (-0.02)	-4.26 (-0.08)	58.35 (0.04)	1.97 (-0.10)
Hides, skins and fur skins, raw (21)	0.01 (-0.01)	0.85 (0.24)	1.27 (0.02)	2.69 (-0.69)	1.37 (0.37)	0.17 (-0.08)
Pulp and paper (25)	-0.08 (-38.97)	-41.01 (-2.67)	-18.06 (-0.64)	-10.70 (-0.30)	151.37 (0.34)	-3.30 (0.26)
Crude fertilizer and crude minerals (27)	0.12 (0.25)	-3.68 (-0.16)	4.71 (-0.05)	-1.26 (-0.10)	11.24 (0.11)	14.35 (0.05)
Metalliferous ores and metal scrap (28)	0.28 (0.18)	-37.60 (-0.26)	-57.68 (-0.22)	-9.22 (-0.04)	145.53 (0.10)	-3.75 (-0.23)
Rubber manufactures (62)	0.29 (0.11)	-19.08 (-0.04)	-29.50 (-0.10)	-6.31 (-0.25)	22.07 (0.05)	49.84 (0.09)
Textile yarn, fabrics, made-up articles (65)	0.09 (-0.06)	-12.32 (-0.04)	-114.21 (-0.10)	-0.20 (-0.05)	167.86 (0.06)	44.69 (0.02)
Iron and steel (67)	0.83 (0.12)	51.36 (0.06)	-28.80 (-0.05)	-17.92 (-0.83)	7.78 (-0.01)	62.19 (0.10)
Manufactures of metals (69)	8.64 (0.09)	7.80 (0.02)	-18.30 (-0.03)	6.90 (0.03)	-3.14 (0.00)	43.61 (0.05)
Articles of apparel and clothing accessories (84)	35.05 (0.51)	-67.08 (-0.04)	-180.25 (-0.11)	408.39 (0.18)	217.66 (0.06)	14.06 (0.00)
Professional, scientific, controlling instruments (87)	0.08 (-0.02)	36.50 (0.02)	100.43 (0.06)	-0.74 (-0.24)	-49.70 (-2.22)	-35.88 (-0.09)

Note: Figures in parenthesis are percentage growth

Source: Own Calculations

It is interesting that Brunei manages to score positive net shift values for most of the commodities with the exception of 'coffee, tea and spices' and 'pulp and paper'. However, the values are small as compared to the net shift effects of the other competing countries, implying their superiority in the production of those goods in the global market. Nevertheless, Brunei does exceptionally well in the

export of 'apparel and clothing' which has even exceeded the performance of Malaysia, Singapore and Thailand. It faces, however, competition from the Philippines and Indonesia.

Next, we look at the net shifts of the growth of exports of each type of commodities to the respective market for Brunei and its competitors. We report the results for 9 markets (which are available for Brunei) and these are China, Japan, Malaysia, Singapore, Australia, UK, US, the EU and ASEAN. For ease of analysis, we divide the results into two. Table 5.8 gives the net shift results for all markets except ASEAN, which in turn is provided in Table 5.9.

Despite having identified 20 product/market most potential combinations, we are only able to report the results of 14 product/market combinations simply because Brunei has not yet penetrated some of the markets. The results, however, show some interesting outcomes.

Table 5.8

The Net Shift Effect for Brunei and its Competitors' Export of Various Types of Commodities in Various Markets, 1991-2003 (US$ Million)

Mkt	Commodities	Brunei	Malaysia	Singapore	Philippines	Indonesia	Thailand
China	Rubber Manufactures	-0.13 (-21.96)	1.98 (-11.26)	0.71 (-0.20)	0.05 (-6.90)	17.09 (3.97)	3.49 (0.36)
	Manufactures of metal	-0.05 (-35.26)	5.10 (-0.39)	4.18 (0.09)	2.00 (0.59)	1.65 (1.65)	1.31 (0.07)
	Professional, scientific, controlling instruments	-0.73 (-81.57)	1.58 (-0.05)	26.07 (0.18)	2.89 (-0.32)	-9.22 (-17.94)	-6.30 (-2.91)

(Table 5.8 continues overleaf)

(Table 5.8 continued)

Japan	Manufactures of metal	-3.66 (-11.81)	-2.57 (-1.45)	-7.97 (-0.22)	0.61 (-3.69)	-6.69 (-0.18)	18.11 (0.09)
Malaysia	Coffee, Tea & Spices	0.16 (1.17)	na	-19.88 (-0.51)	-0.89 (-15.49)	33.32 (0.34)	-1.44 (-1.92)
Singapore	Hides & Skins	0.01 (0.03)	0.04 (-0.11)	Na	0	0	0.08 (2.86)
	Articles of apparel and clothing accessories	66.02 (-3.00)	-24.92 (-0.46)	na	19.17 (-0.78)	1.42 (1.68)	32.47 (0.08)
Australia	Manufactures of metal	0.10 (-10.04)	0.48 (0.01)	0.09 (-0.03)	0.11 (-0.08)	1.13 (0.19)	1.34 (0.05)
	Articles of apparel and clothing accessories	-0.03 (0.31)	0.45 (0.02)	-1.62 (-0.36)	1.74 (0.12)	4.23 (0.11)	0.90 (0.00)
UK	Manufactures of metal	0.21 (2.05)	0.67 (-0.02)	-0.76 (-0.05)	0.31 (0.26)	0.72 (-0.17)	1.99 (0.08)
	Articles of apparel and clothing accessories	0.83 (0.72)	-7.82 (-0.07)	-16.05 (-0.11)	4.60 (-0.01)	25.92 (0.10)	-1.998 (-0.02)
US	Manufactures of metal	-0.05 (-0.14)	3.84 (0.04)	-13.82 (-0.28)	-1.32 (0.03)	4.84 (0.03)	15.14 (0.11)
	Articles of apparel and clothing accessories	27.87 (0.49)	-53.03 (-0.05)	-156.45 (-0.19)	252.20 (0.19)	87.15 (0.06)	46.34 (0.04)
EU	Articles of apparel and clothing accessories	0.50 (0.26)	-13.49 (-0.03)	3.62 (0.01)	41.61 (0.11)	57.02 (0.06)	-22.14 (-0.03)

Note: Figures in parenthesis are percentage growth

Source: Own Calculations

Our results show that Brunei's performance of all of its exports to China and Japan are still weak. In contrast, its performance in the remaining two Asian markets, Malaysia and Singapore, are positive particularly for the export of 'apparel and clothing accessories' to Singapore, in which Brunei appears to be in the lead among the other competing countries. It is also interesting that the same export is also showing competitiveness in other markets including, the UK, the US and the EU despite facing stiff competition from the Philippines, Indonesia and Thailand.

Meanwhile, Table 5.9 shows the performance of Brunei's non-oil exports of each of the twelve types of commodity, in relation to its main competitors in the ASEAN market as a whole. Our result shows that Brunei does not appear to show competitiveness in a majority of its exports to the ASEAN market. Despite this, Brunei is doing extremely well in the exports of two commodities, namely 'textile yarn, fabrics and made-up articles' and 'apparel and clothing accessories', surpassing the performance of all of the competing countries. Another interesting result for Brunei is the positive net shift effect value of 'manufactures of metals' which also shows that Brunei's competitiveness even exceeds that of Malaysia and Thailand, both of which record negative net shift values.

Table 5.9

The Net Shift Effect for Brunei and its Competitors' Export of Various Types of Commodities in the ASEAN Market, 1991-2003 (US$Million)

	Brunei	**Malaysia**	**Singapore**	**Philippines**	**Indonesia**	**Thailand**
Fish, crustacean and molluscs (03)	-0.54 (-5.01)	-3.34 (-0.17)	-8.03 (-0.21)	-1.02 (-0.05)	6.81 (0.03)	4.80 (0.01)
Coffee, tea, cocoa, spices (07)	-0.01 (-7.15)	-9.08 (-0.10)	-4.24 (-0.02)	-1.04 (-0.62)	28.22 (0.12)	-4.23 (-0.52)
Hides, skins and fur skins, raw (21)	0.04 (0.22)	0.53 (0.27)	-0.14 (-0.38)	0.73 (1.07)	0.63 (1.76)	0.19 (-0.21)
Pulp and paper (25)	-0.02 (-59.09)	-6.23 (-9.16)	-5.54 (-0.37)	2.34 (-2.39)	37.38 (0.39)	5.14 (0.19)
Crude fertilizer and crude minerals (27)	-0.11 (-27.86)	-3.57 (-0.24)	-1.54 (-0.08)	0.62 (-0.35)	13.51 (0.19)	2.08 (0.03)
Metalliferous ores and metal scrap (28)	-0.23 (-1.55)	39.29 (0.07)	-19.05 (-0.42)	2.06 (0.08)	34.00 (0.27)	-7.44 (-2.08)
Rubber manufactures (62)	-0.59 (-1.59)	-67.04 (-0.17)	-6.12 (-0.05)	-1.,01 (-0.40)	33.21 (0.24)	6.69 (0.04)

(Table 5.9 continues overleaf)

(Table 5.9 continued)

Textile yarn, fabrics, made-up articles (65)	96.96 (-0.33)	-8.20 (-0.08)	2.70 (0.00)	2.97 (-0.06)	1.76 (-0.52)	15.63 (0.05)
Iron and steel (67)	-1.45 (-1.38)	-4.95 (-0.12)	-12.12 (-0.07)	1.97 (-0.75)	77.69 (0.11)	24.46 (-0.20)
Manufactures of metals (69)	5.90 (0.09)	-27.87 (-0.13)	503.51 (0.90)	0.51 (-0.65)	5.31 (-0.14)	-3.99 (-0.11)
Articles of apparel and clothing accessories (84)	55.62 (-2.02)	-15.33 (-0.23)	-3.06 (-0.48)	18.94 (-0.14)	29.26 (0.14)	30.45 (0.03)
Professional, scientific, controlling instruments (87)	-1.00 (-0.53)	9.53 (-0.07)	45.06 (0.07)	26.79 (-9.62)	-6.64 (-1.29)	-10.89 (-0.28)

Note: Figures in parenthesis are percentage growth Source: Own Calculations

In this section, we have shown Brunei's export performances compared to a number of ASEAN countries in a number of markets. From the results, it is clear that Brunei needs to improve its overall competitiveness of those products we identified as potential products to the identified markets, such as China, Japan, Australia, US and the EU in order to reap the opportunity of their growing market. Despite this, Brunei has shown some degree of competitiveness of two of its products such as 'apparel and clothing accessories', 'textile yarn, fabrics and made-up articles' and to a lesser degree, 'manufactures of metals'. In the next section we will look at the factors contributing to this performance.

5.5.2 The Decomposition of Export Differentials

The key advantage of shift-share analysis lies in its ability to identify the overall pattern of a country's export growth relative to a reference group and to decompose this performance in terms of the export structure (Industry Mix Effect – IME), competitiveness (Competitive Effect – CE) and the interplay between the export structure and competitiveness (Interaction Term – IE). A positive IME

occurs when Brunei's share of the faster growing industries is greater than the share of the same industries in the reference economies and vice-versa. A positive CE occurs when the growth rates of industries are higher than the normal growth of the reference economies. The final source of net shift is IE, which will be positive if the export market is specialized in those sectors of faster growth. This decomposition is summarized for Brunei in Tables 5.10 to 5.12 for the various export destinations.

Table 5.10: The Decomposition of the Net Shifts for Brunei's Exports into Positive and Negative in Various Markets, 1991-2003 (US$ Million)

Commodity	Market	NS	IME	CE	IE
Coffee, Tea & Spices (SITC 07)	Malaysia	0.16 (1.17)	-0.06 (0.40)	0.02 (-1.73)	0.20 (2.50)
Hides & Skins (SITC 21)	Singapore	0.02 (0.03)	0.00 (-0.12)	0.00 (-0.25)	0.02 (0.39)
Rubber Manufactures (62)	China	-0.13 (-21.96)	-0.13 (-21.75)	-0.06 (-18.40)	0.06 (18.18)
Manufactures of Metals (SITC 69)	China	-0.05 (-35.26)	-0.15 (-38.73)	4.61 (-17.96)	-4.51 (21.43)
	Japan	-3.66 (-11.81)	-3.66 (-11.81)	1.04 (-17.67)	-1.04 (17.67)
	Australia	0.10 (-10.04)	0.16 (-10.74)	0.01 (-11.18)	-0.07 (11.88)
	UK	0.22 (2.05)	0.00 (-0.02)	0.13 (1.45)	0.08 (0.62)
	US	-0.05 (-0.14)	-0.08 (-0.37)	0.10 (-0.47)	-0.08 (0.61)
Apparel & Clothing Accessories (84)	Singapore	66.02 (-3.00)	2.55 (-4.69)	3.34 (-3.98)	60.12 (5.68)
	Australia	-0.04 (0.31)	-0.05 (-0.11)	0.45 (13.14)	-0.44 (-12.72)
	UK	0.83 (0.72)	-0.06 (-0.30)	1.17 (3.25)	-0.26 (-2.23)
	US	27.87 (0.49)	2.78 (0.02)	4.18 (0.20)	20.91 (0.27)
	EU	0.50 (0.26)	0.08 (-0.01)	0.35 (0.51)	0.06 (-0.23)
Professional & Scientific Instruments (87)	China	-0.73 (-81.57)	-0.73 (-81.56)	-0.39 (-43.75)	0.39 (43.74)

Note: Figures in parenthesis are percentage growth Source: Own Calculation

Our results show that the positive overall net shift effect of Brunei's export of 'apparel and clothing accessories' to the foreign markets is the result of a positive competitive effect which appears in all of the markets even in Australia where Brunei's net shift is negative. In addition, the high positive net shift values in the Singapore and the US markets are also the result of positive industry-mix effect and the interaction effect, which indicate Brunei's strong competitiveness of 'apparel and clothing accessories' in these two markets.

Another interesting result is the net shift decomposition of 'manufactures of metal' which shows that the competitive effects are positive in all of the markets and the negative net shift effect that appears in China, Japan and the US are the result of negative industry-mix effect and interaction effect.

We can turn to the decomposition of the export differentials in the ASEAN market summarised in Table 5.11, which interestingly show that the negative performance in the exports of many of the commodities is not due to the lack of competitiveness, as can be seen by positive CEs, rather it is due to industry structure (negative IME). This implies that Brunei needs to be more selective in the types of industries to be concentrated upon i.e. to venture more into growing industries.

Meanwhile, Brunei's positive overall export performance of 'textile yarn, fabrics and made-up article', 'apparel and clothing accessories' and even for 'manufactures of metal' to the ASEAN market are attributable to positive CE and positive IE.

Table 5.11

The Decomposition of the Net Shifts for Brunei's Exports into Positive and Negative in the ASEAN market, 1991-2003 (US$ Million)

Commodity	NS	IME	CE	IE
Fish, crustacean and molluscs (03)	-0.54 (-5.01)	-0.60 (-5.14)	0.56 (-3.36)	-0.50 (3.49)
Coffee, tea, cocoa, spices (07)	-0.12 (-7.15)	-0.25 (-7.57)	1.53 (-6.99)	-1.40 (7.42)
Hides, skins and fur skins, raw (21)	-0.12 (0.22)	-0.25 (0.01)	1.53 (-0.03)	-1.40 (0.24)
Pulp and paper (25)	-0.02 (-59.09)	-0.18 (-61.53)	1.21 (-102.41)	-1.04 (104.86)
Crude fertilizer and crude minerals (27)	-0.11 (-27.86)	-0.21 (-28.39)	0.85 (-6.38)	-0.75 (6.90)
Metalliferous ores and metal scrap (28)	-0.22 (-1.55)	-0.45 (-1.58)	-0.08 (-1.56)	0.31 (1.58)
Rubber manufactures (62)	-0.59 (-1.59)	-0.59 (-1.51)	-0.29 (-1.35)	0.29 (1.27)
Textile yarn, fabrics, made-up articles (65)	96.96 (-0.33)	-1.36 (-2.60)	23.29 (4.05)	75.02 (-1.77)
Iron and steel (67)	-1.45 (-1.38)	-2.15 (-1.44)	-0.06 (-1.05)	0.76 (1.11)
Manufactures of metals (69)	5.90 (0.09)	0.52 (0.00)	1.21 (-0.02)	4.16 (0.11)
Articles of apparel and clothing accessories (84)	55.62 (-2.02)	0.45 (-3.17)	4.82 (-2.17)	50.34 (3.32)
Professional, scientific, controlling instruments (87)	-1.00 (-0.53)	-0.71 (-0.38)	-0.62 (-0.43)	0.33 (0.28)

Note: Figures in parenthesis are percentage growth

Source: Own Calculations

Finally, we look at the Brunei's decomposition of the net shifts for the total exports of each commodity summarised in Table 5.12.

Table 5.12

The Decomposition of the Net Shifts for Brunei into Positive and Negative for Total Exports by SITC Category,1991-2003 (US$ Million)

Commodity	NS	IME	CE	IE
Fish, crustacean and molluscs (03)	0.09 (-0.15)	-0.05 (-0.52)	2.00 (1.87)	-1.85 (-1.50)
Coffee, tea, cocoa, spices (07)	-0.00 (-0.88)	-0.05 (-1.15)	0.44 (1.84)	-0.39 (-1.56)
Hides, skins and fur skins, raw (21)	0.01 (-0.01)	-0.00 (0.03)	0.00 (0.00)	0.12 (0.55)
Pulp and paper (25)	-0.08 (-38.97)	-0.10 (-38.99)	0.11 (-59.12)	-0.09 (59.13)
Crude fertilizer and crude minerals (27)	0.12 (0.25)	-0.00 (-0.30)	0.12 (0.28)	0.00 (0.28)
Metalliferous ores and metal scrap (28)	0.29 (0.18)	-0.00 (0.00)	0.29 (0.06)	0.00 (0.12)
Rubber manufactures (62)	0.29 (0.11)	-0.02 (-0.03)	0.34 (0.05)	-0.03 (0.09)
Textile yarn, fabrics, made-up articles (65)	0.09 (-0.06)	-0.08 (-0.14)	0.40 (0.15)	-0.22 (-0.07)
Iron and steel (67)	0.83 (0.12)	0.32 (0.07)	-0.02 (-0.02)	0.53 (0.07)
Manufactures of metals (69)	8.64 (0.09)	1.71 (0.10)	0.59 (0.01)	6.34 (0.15)
Articles of apparel and clothing accessories (84)	35.05 (0.51)	1.48 (0.04)	3.04 (0.04)	30.53 (0.44)
Professional, scientific, controlling instruments (87)	0.08 (-0.02)	0.30 (0.08)	-0.02 (-0.04)	-0.19 (-0.06)

Note: Figures in parenthesis are percentage growth

Source: Own Calculations

As discussed in the previous section, Brunei has surprisingly shown positive overall net shift effect in many of its non-oil exports in the global market even if the values are small compared with the other competing countries. What is even more interesting is that Brunei has shown positive CE in almost all of its exports with the exception of only two types of export, 'iron and steel' and 'professional, scientific and controlling apparatus'. It appears that the factor that pulls down

Brunei's overall global competitiveness is the structure or the choice of industries as can be seen in the negative industry-mix effects.

With regard to the positive performance of 'apparel and clothing accessories' in the global market, our result also shows positive combination of the three effects, which further implies the potential of this industry to be further developed.

5.6 Conclusion

This chapter has performed a detailed analysis of the performance of Brunei's non-oil exports beginning with the year when export incentives were put in place. The shift-share analysis has provided us with some insights into the competitiveness of non-oil exports in a number of potential markets. We summarise our results in Table 5.13 to give the overview of the performance of each of the export in various markets.

From the table we can see that Brunei has indeed shown some competitiveness in a number of exports notably for the export of 'apparel and clothing accessories' in most markets and 'manufactures of metal' in a number of markets. However, its performance results for the other types of exports are weak as compared to its competitors. Our results also show that Brunei has yet to penetrate into some of these growing markets - in particular, China. It will be interesting to analyse Brunei's export performance to China in the years to come in order to see the effect of ASEAN-China free trade agreement which will be fully effective in 2010.

Table 5.13

Summary of Brunei's Competitiveness in the Potential Markets

Commodity	Potential Market	Competitiveness
Coffee, tea, cocoa, spices (07)	Malaysia	+
	Thailand	na
	ASEAN	-
Hides, skins and fur skins, raw (21)	Singapore	+
	ASEAN	+
Pulp and paper (25)	China	na
	ASEAN	-
Crude fertilizer and crude minerals (27)	China	na
	ASEAN	-
Metalliferous ores and metal scrap (28)	China	na
	ASEAN	-
Rubber manufactures (62)	China	-
	ASEAN	-
Iron and Steel (67)	China	na
	ASEAN	-
Textile yarn, fabrics and made-up articles (65)	ASEAN	+
Manufactures of metals (69)	Japan	-
	China	-
	UK	+
	US	-
	Australia	+
	ASEAN	+
Articles of apparel and clothing accessories (84)	Singapore	+
	Korea	na
	UK	+
	US	+
	Australia	-
	EU	+
	ASEAN	+
Professional, scientific, controlling instruments (87)	China	-
	ASEAN	-

Source: Own calculation. Na= not available

Some policy recommendations can also be drawn from these results. The role of the export incentives can be strengthened to help increase the performances of the non-oil exports in order to compete in the global market. First, it is imperative for

Brunei to identify the types of fast growing industries among its competitors and then promote these industries by giving special incentives in these sectors. From our current exercise alone, we have identified a few non-oil export types which are considered as fast growing. For example, 'iron and steel' and 'manufactures of metals' are important exports of competing countries in the ASEAN and the global markets. This analysis could be further extended to other types of non-oil exports to explore other non-oil industries.

Secondly, some kind of incentives to improve competitiveness of the products must also be made available either in the form of subsidies and/or support in the area of research and development. While subsidy is generally discouraged in the free trade environment, there are legitimate economic grounds for its provision if it will raise income and output above what would otherwise be the case.

Finally, the current production incentives which are mainly in the form of tax incentives may not be adequate to entice new investment in new industries. The World Bank report on doing business in Brunei, for example, has enumerated the areas in which Brunei need to improve (World Bank, 2007) which include reducing bureaucracy and increasing transparency.

APPENDICES TO CHAPTER 5

Table A5.1: Brunei's list of Preferred Industries, Activities and Products.

Industry	Activities and Products
Primary Production	Agriculture: • Poultry fanning • Cultivation of vegetables, tubers and roots • Cultivation of fruits • Livestock fanning • Floriculture • Production of planting materials • Cultivation of rice and other cereals • Cultivation of herbs and spices • Cultivation of fodder crops or animal feed ingredients • Cultivation of medicinal plants Fisheries: • Capture fisheries: Offshore/Inshore • Aquaculture – Crustaceans and fish • Spawning, breeding or culture of aquarium fish Forestry and forestry products: • Timber plantation • Non-timber products • Reforestation
Integrated Production and Processing	Agriculture: • Cultivation and processing of fodder crops for animal feed ingredients • Poultry farming and poultry products processing • Cultivation and processing of vegetables, tubers and roots • Cultivation and processing of ornamental flowers • Cultivation and processing of fruits • Livestock farming and processing • Cultivation and processing of rice and other cereals • Cultivation and processing of herbs and spices • Cultivation and processing of medicinal plants • Cultivation and processing of coffee Fisheries: • Low value fish into high value added products • Convenience fishery products • Aquaculture feed Forestry: • Processing and treatment of wood products • Processing of non-timber products • Furniture and fixtures • Integrated timber complex

(Table A5.1 continues overleaf)

(Table A5.1 continued)

Manufacture of Food Products, Creameries and Beverages	• Meal and flour of wheat • Poultry and beef preparations • Sausages and other prepared poultry/beef products • Creameries and beverages • Sugar confectionary and other food preparations • Chocolate and other food preparations containing cocoa or chocolate • Dried fruit • Snack prawns, fish or cuttlefish • Fish preparations – fish ball, fish cake • Other fish preparations – dried, salted, smoked or preserved • Whole frozen and fresh frozen (dressed) fish
Manufacture of Silica Products	• Processing and manufacturing of silica products
Manufacture of Clay Products	• Ceramic products • Pottery
Manufacture of Metal Products	• Metal products processing and manufacturing • Metal containers for storage and transport • Wire products (excluding electrics) • Nails, screws, nuts, bolts, rivets and similar parts of iron steel copper • Tools for use in the hand or machines • Sanitary, plumbing, heating, lighting, fixtures and fittings
Manufacture of Non-Metal Products	• Lime, cement and fabricated building materials • Refractory construction material • Mineral manufacturing
Manufacture of Apparel Products	• Apparel products
Manufacture of Textile Mill Products	• Synthetic and regenerated (artificial) fibres • Floor covering, tapestries etc. • Materials of rubber • Plastic materials, regenerated cellulose and artificial resins
Manufacture of Leather Products	• Footwear • Other leather products
Manufacture of Electrical and Electronic Machineries/ Equipment/ Apparatus	• Electrical power machinery and switch gear • Electrical apparatus for medical purposes and radiological apparatus • Telecommunication apparatus • Domestic electrical equipment • Equipment for distributing electricity

(Table A5.1 continues overleaf)

(Table A5.1 continued)

Printing Industry	• Printed matter • Signs and advertising
Manufacture of Chemical Products	• Pigments, paints, varnishes and related materials • Chemical materials and other chemical products • Fertilizer • Medicinal and pharmaceutical products • Essential oil, perfume, and flavour materials • Soaps, cleansing and polishing compounds • Inorganic chemicals, elements oxides and halogen salts
Shipyards	• Maintenance and repair
Other Manufactured Goods	• Perambulators, toys, games and sporting goods • Jewellery and goldsmith/ silversmith wares • Travel goods, handbags and similar articles
Services	• Any engineering or technical services including laboratory, consultancy and research. • ICT • Industrial design. • Leisure and recreation. • Publishing. • Education providers. • Medical services. • Agricultural technology. • Services related to the provision of warehouse facilities. • Services related to the □organization of exhibitions and conferences. • Financial services. • Business and management consultancy. • Venture capital fund. • Operation of any mass rapid transit system. • Private museum.

Source: Ministry of Industry and Primary Resources, 2004.

Table A5.2: Shift-Share Results for Brunei in Various Commodities and Destinations (US$)

Market: CHINA		91	92	93	94	95	96	97	98	99	00	01	02	**03**
62	NS	na	na	Na	na	Na	771	-787	1172	-4543	-50455	-161963	-924917	62451
	IME	na	na	Na	na	Na	-2996	2836	10399	-4635	-49640	-157178	-921059	54106
	CE	na	na	Na	na	Na	26	-69	-63	376	-10171	-532414	-775519	791671
	IE	na	na	Na	na	Na	3741	-3555	-9164	-284	9357	527628	771661	-783326
69	NS	na	na	Na	na	Na	506	6562	-1550	11334	-1623	-494943	-335138	379513
	IME	na	na	Na	na	Na	-1187	-1427	96	-1372	-3417	-601454	-333724	-296323
	CE	na	na	Na	na	Na	128	542	-104	159623	53581	3104469	-1755822	35321487
	IE	na	na	Na	na	na	1565	7447	-1542	-146917	-51787	-2997958	1754408	-34645652
87	NS	na	na	Na	na	na	53	55	156	-67474	-14233	-1511202	-4112542	-169662
	IME	na	na	Na	na	na	-6	-57	122	-67112	-14352	-1510985	-4111968	-169743
	CE	na	na	Na	na	na	47	145	8	-127632	101229	-622845	-2799823	314212
	IE	na	na	Na	na	na	11	-34	26	127269	-101110	622628	2799249	-314131
Japan		91	92	93	94	95	96	97	98	99	00	01	02	**03**
69	NS	-3429266	217148	-839423	-2449146	-1895784	-149166	-121500	293743	-225588	-304112	-1405255	-209742	-6856542
	IME	-3428422	210995	-854183	-2475358	-1963986	-148895	-121740	293441	-226287	-304335	-1397285	-237089	-6853088
	CE	-1558128	2583819	2058372	1452967	1463954	-583087	567919	705222	1279777	389076	-1687247	2289259	-2610230
	IE	1558043	-2583204	-2056896	-1450346	-1457134	580379	-565520	-702198	-1272781	-386839	1686450	-2286524	2609885
Malaysia		91	92	93	94	95	96	97	98	99	00	01	02	**03**
07	NS	-47,889	-31,581	9,868	-142,142	-17,910	16,935	152,052	83,441	-90,305	-49,066	3,630,898	-294,282	-618,968
	IME	-28,156	-9,328	4,223	-126,003	-14,307	14,872	152,216	-8,357	-82,388	-52,087	15,887	-177,195	-549,300
	CE	-124,894	-35,504	1,059	-235,622	-55,336	36,151	-7,610	336,299	-341,371	68,086	1,530,909	-444,359	-335,672
	IE	105,161	13,251	4,586	219,482	51,733	-34,088	7,446	-244,500	333,454	-65,066	2,084,102	327,273	266,005

(Table A5.2 continues overleaf)

(Table A5.2 continued)

Singapore		91	92	93	94	95	96	97	98	99	00	01	02	03
21	NS	-5309	-5832	-3394	-18269	-1745	-16690	8234	2437	-1390	-4792	275353	13952	-16120
	IME	264	-1766	2734	-3398	206	-11521	-535	-1749	-24	923	-26914	135855	-8672
	CE	-1557	-1903	-2738	-19040	-3356	-15659	7704	2467	-841	-5064	35887	-14410	-1741
	IE	-4015	-2163	-3390	4169	1405	10489	1065	1719	-525	-652	266380	-107493	-5707
Australia		91	92	93	94	95	96	97	98	99	00	01	02	03
69	NS	-58730	-19362	-82010	144344	411117	11261	125640	-39615	117807	-105179	402771	-768790	-1601295
	IME	-57748	-18980	-87455	3720	-8165	-564	1178	-91	-159723	-141036	202415	-664203	-1490612
	CE	-349699	-110650	282403	5562	677843	1229	120914	-38747	1442241	342229	1301606	-1573978	-3001637
	IE	348717	110267	-276957	135061	-258561	10595	3547	-777	-1164711	-306372	-1101249	1469391	2890954
84	NS	-97732	-44322	-7917	76126	-64872	948	-43935	11424	-19679	-78284	334344	-73367	-506666
	IME	-84574	-38550	-16385	2147	-46823	47	-46904	13518	-158200	-84332	337203	-83344	-504815
	CE	-475965	-169564	66382	1200	-251471	838	33877	-37221	5140580	398999	-1245157	3108371	-630670
	IE	462807	163792	-57914	72779	233423	63	-30908	35127	-5002058	-392951	1242298	-3098394	628819

Source: Own Calculations

Definitions:

07: Coffee, Tea, Cocoa and Spices;
21: Hides, Skins and Furskins
25: Pulp and Paper
27: Crude Fertlizers and Crude Minerals
62: Rubber Manufactures
67: Iron and Steel
69: Manufactures of Metals
84: Articles of Apparel and Clothing
87: Professional, Scientific and Controlling Instruments

Table A5.3: Shift-Share Results for Brunei in Various Commodities in ASEAN Market (US$)

ASEAN		91	92	93	94	95	96	97	98	99	00	01	02	**03**
03	NS	-1192457	-972140	-776657	-363238	-183379	-147980	382317	-27145	-565741	345414	1387108	234201	59801
	IME	-1107871	-927509	-747931	-340806	-193851	-150253	393223	-41132	-611202	321102	675365	209799	-79520
	CE	-4042486	-3139425	-1977631	-2639436	826499	173498	-1670941	1183350	4417624	1816577	1248993	380946	1320409
	IE	3957900	3094793	1948905	2617004	-816027	-171226	1660035	-1169363	-4372164	-1792265	-1177819	-356544	-1181088
07	NS	457050	-226202	-115192	-1536811	-320886	154288	-165031	-258645	-59618	249812	2374969	-1472556	-920830
	IME	467260	-219989	-107667	-1526362	-323652	150790	-157952	-326300	-53140	238472	349839	-1354484	-935387
	CE	-1090014	-740341	-932908	-1661940	320098	355368	-1552205	4411239	-1015939	1369297	26769195	-2552305	246730
	IE	1079805	734127	925382	1651491	-317332	-351871	1545127	-4343584	1009461	-1357957	-24744065	2434233	-232173
21	NS	81000	-18694	-22743	213140	-21818	-10218	2866	-8123	18003	-10689	147289	129930	74070
	IME	-76138	-30933	1122	35843	-2342	19220	3468	-2601	3197	9244	-14867	3894	56421
	CE	27643	1728	-12841	33681	-5350	-12513	-267	-2192	9133	-15160	50895	24966	2725
	IE	129494	10512	-11024	143616	-14126	-16925	-335	-3329	5673	-4773	111261	101070	14924
25	NS	51814	-129250	-120743	-631869	-293504	422540	-3282	-1755773	442671	116804	-57440	2018824	-350052
	IME	53977	-124173	-116440	-623754	-292919	173888	-3756	-1736161	436574	114608	-56428	-72526	-279992
	CE	-65632	-217371	-194745	-475722	-997195	10355360	19589	-1775158	426746	124475	-59575	9296382	-381055
	IE	63469	212294	190441	467608	996611	-10106708	-19114	1755546	-420649	-122280	58564	-7205031	310995
27	NS	-413016	-933704	-157202	-229609	-42556	-212443	61316	358668	-376103	-180315	-328584	164225	1074196
	IME	-412089	-949153	-309244	-251703	-107741	-203035	51854	223238	-333001	-213336	-380796	219172	-33136
	CE	-401272	3028603	5366439	501370	783028	-121930	117703	505602	-382907	263029	345835	-642453	3268534
	IE	400345	-3013154	-5214397	-479275	-717843	112522	-108241	-370172	339805	-230008	-293623	587506	-2161202

(Table A5.3 continues overleaf)

(Table A5.3 continued)

ASEAN		91	92	93	94	95	96	97	98	99	00	01	02	**03**
28	NS	-328844	-321013	-5045862	1684192	-192653	247302	-70248	1288381	-842401	413063	-1610445	543687	921133
	IME	-69406	-197469	-4686397	215146	-482064	53024	83625	-209585	-294606	-13770	-978421	296948	-502812
	CE	-909202	-1006448	-4255497	3847231	524028	304168	-302388	912751	-867320	562236	-3402673	915357	2625168
	IE	649764	882905	3896031	-2378185	-234618	-109890	148516	585215	319525	-135403	2770649	-668617	-1201223
62	NS	-958275	-1030316	-1727300	-1069880	-1031905	120003	427184	639846	-817017	83453	-288545	-1036559	-1992807
	IME	-743957	-951277	-1613451	-913968	-1113751	70365	437370	253356	-701636	-79770	-159875	-830297	-2217568
	CE	-1893542	-782422	-920669	-1734213	645557	356771	-78096	1239777	-841668	989540	-934839	-2991484	2119807
	IE	1679224	703383	806819	1578300	-563711	-307133	67909	-853287	726287	-826316	806170	2785223	-1895047
65	NS	-1292355	-4213205	-3093206	-1103144	-44046	399504	2082037	306755	-612187	-733709	-14839002481	-11074002	-4865663
	IME	-1116492	-4369690	-2932295	-1559119	-142538	294920	1543007	469206	-965401	-944763	-2165201	-305696	-2110128
	CE	-7523753	4833579	-4712342	7123835	1110726	1061966	3447547	-1051720	3340466	1775742	-331627971	-4877440	-11654634
	IE	7347889	-4677095	4551431	-6667860	-1012234	-957382	-2908517	889269	-2987253	-1564688	1154437478	-5890866	8899100
67	NS	-4084819	-18169066	1486698	5849058	4686585	230415	409229	3625058	-589238	-447679	-187115	-1206139	-5473281
	IME	-3320381	-17614193	870297	1404881	-66542	-86544	390652	-290839	-200497	-810655	1400243	-876411	-4789254
	CE	-12912759	-11155147	5964955	13872728	6878927	441787	26660	2758962	-542613	500002	-5019633	-1108396	-2085041
	IE	12148320	10600275	-5348554	-9428550	-2125800	-124828	-8082	1156934	153873	-137026	3432275	778668	1401015
69	NS	2881326	1073772	-14786232	-1703314	4010428	610877	2306247	-1194126	4274834	5333573	-5445604	-2322712	94327418
	IME	-827	-1148328	2783724	635613	769131	553970	-695880	-1745048	637333	874668	-29508	-153104	7199004
	CE	2944049	1362523	-1536407	-1956357	1840904	32427	1505085	203583	2177736	2328624	-5231880	-2494311	2950096
	IE	-61897	859576	-2205883	-382570	1400393	24480	1497042	347339	1459765	2130281	-184216	324703	57627449

(Table A5.3 continued)

84	NS	-4694793	498821	-2097526	4654773	1717952	1754444	-539774	40631302	-3957791	1655108	812367384	-16776306	3108367
	IME	-4170705	-1559174	-1750595	-457409	-16455	-569140	229098	-2445593	786233	169184	-2025585	-3121925	30052252
	CE	-9294803	14172929	-1992269	10372090	2084070	1634373	-1182682	6915263	-3237667	868990	40525803	-876279	-1966236
	IE	8770716	-12114935	1645338	-5259908	-349663	689211	413811	36161632	-1506357	616935	773867166	-12778102	-24977650
87	NS	-293379	-996786	-3035968	-1652067	101858	-263371	427998	-204509	-1009550	-134307	-1270705	-1320890	-2704553
	IME	172170	-590705	-1595849	-962797	118452	-252577	341439	-220372	-922038	-432815	-833160	-1265963	-3779550
	CE	-844494	-760576	-3874300	-2887302	-56788	-37497	284708	39605	-437100	1303594	-2517950	-316018	4039550
	IE	378945	354494	2434181	2198032	40194	26703	-198149	-23742	349588	-1005086	2080404	261091	-2964553

Source: Own Calculations

Definitions:

07: Coffee, Tea, Cocoa and Spices;
21: Hides, Skins and Furskins
25: Pulp and Paper
27: Crude Fertlizers and Crude Minerals
62: Rubber Manufactures
67: Iron and Steel
69: Manufactures of Metals
84: Articles of Apparel and Clothing
87: Professional, Scientific and Controlling Instruments

Table A5.4
Shift-Share Results for Brunei Total Export of Various Commodities (US$)

TOTAL		91	92	93	94	95	96	97	98	99	00	01	02	**03**
03	NS	-400116	-56926	-174600	-463192	-161314	244971	-28768	1256390	-2471	-249031	1048058	324191	-69714
	IME	339146	32476	189473	449188	182441	-233846	-290	-186499	-43618	301066	-327627	-378773	390870
	CE	-921699	-327684	-10290	-753993	443457	550474	-2939509	20041400	-771558	879740	7743883	-321161	2423500
	IE	825234	300545	9436	719350	-428488	-531133	2910454	-18961459	727935	-840972	-6991626	296116	-2146946
07	NS	-6930	33432	-44564	-394878	-50479	122899	-94178	-36104	108994	147498	838016	-558158	-67201
	IME	-7875	-28204	40191	390588	46361	-120785	87478	100422	-114382	-137611	-253848	528338	101937
	CE	-178057	80757	-94660	-512526	-265445	225016	-767187	2689527	-60863	487423	4745098	-964918	317945
	IE	163879	-72724	87060	494493	260454	-220452	759625	-2627524	58992	-473647	-4127912	899011	-291642
21	NS	65919	-22645	-14862	60344	-30364	1524	27067	-19237	39144	-281	69094	57987	-91333
	IME	-1173	-1133	345	2146	2630	3179	-874	-481	4948	22280	-8446	1020	-4448
	CE	3021	665	-3012	29988	-7910	-2062	5370	-6007	3571	-13793	70153	19165	-3550
	IE	102819	33193	-13381	564090	-33642	-6616	25912	-12249	14910	-21961	646814	241132	-38966
25	NS	-2955	239	48	-94874	-6877	60563	-25049	-345374	85767	-267864	123234	3000	-199008
	IME	-941	-2709	-1456	94252	687632	-60526	26217	345282	-83389	268034	-123270	50725	183744
	CE	-8761	-4405	-3075	-170626	-818089	85949	388713	-889125	1431934	-103954	89359	172817997	-289310
	IE	5243	2875	2119	169237	817117	-85826	-387619	888975	-1429409	103846	-89266	-140208571	247478
27	NS	-14863	5196	116466	31679	154726	1756	-24787	102573	-50919	30178	289314	-159210	306342
	IME	11169	10060	44593	2018	6464	10745	7321	-52501	60699	28293	5426	64899	-8601
	CE	-63184	89342	297673	63749	227246	8551	-39856	111616	-50606	50979	269947	-380078	1037303
	IE	58696	-75630	-157598	-31085	-70514	-3011	18460	-17074	1570	-13377	18986	266347	26330
28	NS	-279021	-125206	121766	573709	203691	80785	-153576	677333	-65720	-64633	-417277	269716	724349
	IME	47283	29284	-48844	162438	759707	22402	-105358	-220348	-17750	547277	3460	-128560	380494
	CE	-284065	-257716	161429	1019441	348059	100350	-297216	1173948	-32182	-94030	-1475790	593016	2830198
	IE	6052	149498	-56870	133065	-45360	-15994	106048	250381	-21615	-6099	1061001	-412788	-1062946
62	NS	-159189	-34934	118710	-129842	937419	-33215	-123466	449760	-37616	239333	-332444	-431754	841855
	IME	34734	52028	25768	64581	207785	105445	-11078	-1394	49521	98514	-5634	287686	577420
	CE	-107090	-40663	53678	-133036	783616	-34244	-152534	416722	-41375	203088	-719519	-902765	5183368
	IE	-77107	-20498	43939	6208	121568	-495	27100	33149	-19089	24406	384068	691313	-1587921

(Table A5.4 continues overleaf)

(Table A5.4 continued)

TOTAL		91	92	93	94	95	96	97	98	99	00	01	02	03
65	NS	-519038	-123208	-80473	284322	34045	-17574	522695	170281	169811	-177834	1670077	69610	-759953
	IME	359499	439288	37790	203123	541752	117606	-292784	-440824	349574	645723	-567256	-270747	483135
	CE	-927553	451154	-171630	1178004	1345123	225737	943927	-534004	732441	673681	2883945	-244883	-1319133
	IE	667048	-291008	116895	-762248	-934646	-159969	-610637	385802	-380857	-434779	-1511092	149359	882338
67	NS	-597180	328228	410012	3742851	4676639	511267	-984637	3109290	248258	2150845	-2237708	-678577	187373
	IME	40751	20876	104250	33798	338157	29283	-192	124506	-128866	377502	-184100	176990	1611954
	CE	-213862	68131	20849	597296	575894	73459	-232113	509737	142824	56460	-925464	-516257	-361160
	IE	-473554	199092	64857	2977097	2583656	313027	-751900	2089243	1078880	272486	-1094515	-247001	-158386
69	NS	2996178	-773436	4632818	1416134	5025921	1267783	1475592	-1898290	5182158	6263782	-6439150	-1845903	9083251
	IME	104354	37219	121287	222155	397137	129734	35127	-215280	60964	272906	-100558	153637	863877
	CE	51323	-80371	114493	-102547	158339	25836	127568	-36140	302912	335569	-1236021	-649795	8662315
	IE	970852	-1290848	2194070	-1302060	1387509	206256	1056975	-267672	4061778	3269362	-4811671	-1566488	78583902
84	NS	9601129	-184320	-3951873	98703939	121161225	6003259	-16401357	86451336	-7931916	27625968	52299690	70970987	11355660
	IME	1089647	105433	153092	73393	570097	180030	-424477	-283628	569879	1295493	-648581	-630976	499299
	CE	794662	-119525	-2126297	15062187	10856486	425779	-1887907	6937296	-1043492	1235549	4396373	4863615	170839
	IE	3713916	-549575	-1967214	83236169	104801393	3920004	-11849260	82903515	-15176987	12882699	56193315	75962258	2851358
87	NS	-990276	-512221	-396174	-440865	1619417	245620	466	-192913	843535	1021792	-1800502	902982	843055
	IME	76218	58550	65158	182566	222274	67245	192016	-85014	159584	441587	412075	671357	822571
	CE	-148493	-106637	-111431	-251546	366308	39774	-119529	-30568	111318	127464	-2279909	1284457	874943
	IE	-1729480	-899419	-685697	-690382	779881	76503	-197865	-42935	300880	200324	585173	-250529	-16436

Source: Own Calculations

Definitions:

07: Coffee, Tea, Cocoa and Spices;
21: Hides, Skins and Furskins
25: Pulp and Paper
27: Crude Fertlizers and Crude Minerals
62: Rubber Manufactures
67: Iron and Steel
69: Manufactures of Metals
84: Articles of Apparel and Clothing
87: Professional, Scientific and Controlling Instruments

Appendix 5B:
Mathematical Exposition for the Decomposition of Export Differential (Net Shift)

Consider a competing country's export of commodity i to market j at time t, X_t^{ij}, and the reference countries' like exports with the ^ sign. We can express the change in the competing country's exports between two periods t and t-1 as:

$$X_t^{ij} - X_{t-1}^{ij} = X_{t-1}^{j} \cdot \frac{\hat{X}_{t-1}^{ij}}{\hat{X}_{t-1}^{j}} \left(\frac{\hat{X}_t^{ij}}{\hat{X}_{t-1}^{ij}} - 1 \right)$$
$$+ X_{t-1}^{j} \cdot \left\{ \left(\frac{X_{t-1}^{ij}}{X_{t-1}^{j}} \right) - \left(\frac{\hat{X}_{t-1}^{ij}}{\hat{X}_{t-1}^{j}} \right) \right\} \cdot \left\{ \frac{\hat{X}_t^{ij}}{\hat{X}_{t-1}^{ij}} - 1 \right\}$$
$$+ X_{t-1}^{j} \cdot \frac{\hat{X}_{t-1}^{ij}}{\hat{X}_{t-1}^{j}} \cdot \left\{ \left(\frac{X_t^{ij}}{X_{t-1}^{ij}} \right) - \left(\frac{\hat{X}_t^{ij}}{\hat{X}_{t-1}^{ij}} \right) \right\}$$
$$+ X_{t-1}^{j} \left\{ \left(\frac{X_{t-1}^{ij}}{X_{t-1}^{j}} \right) - \left(\frac{\hat{X}_{t-1}^{ij}}{\hat{X}_{t-1}^{j}} \right) \right\} \cdot \left\{ \left(\frac{X_t^{ij}}{X_{t-1}^{ij}} \right) - \left(\frac{\hat{X}_t^{ij}}{\hat{X}_{t-1}^{ij}} \right) \right\}$$

Summing across all commodities, the net shift of a competing country in a market j, is:

$$\left[X_t^{j} - X_{t-1}^{j} \right] - X_{t-1}^{j} \cdot \sum_i \frac{\hat{X}_{t-1}^{ij}}{\hat{X}_{t-1}^{j}} \left(\frac{\hat{X}_t^{ij}}{\hat{X}_{t-1}^{ij}} - 1 \right) =$$
$$X_{t-1}^{j} \cdot \sum_i \left\{ \left(\frac{X_{t-1}^{ij}}{X_{t-1}^{j}} \right) - \left(\frac{\hat{X}_{t-1}^{ij}}{\hat{X}_{t-1}^{j}} \right) \right\} \cdot \left\{ \frac{\hat{X}_t^{ij}}{\hat{X}_{t-1}^{ij}} - 1 \right\} \rightarrow \textit{IndustryMixEffect}$$
$$+ X_{t-1}^{j} \cdot \sum_i \frac{\hat{X}_{t-1}^{ij}}{\hat{X}_{t-1}^{j}} \cdot \left\{ \left(\frac{X_t^{ij}}{X_{t-1}^{ij}} \right) - \left(\frac{\hat{X}_t^{ij}}{\hat{X}_{t-1}^{ij}} \right) \right\} \rightarrow \textit{CompetitiveEffect}$$
$$+ X_{t-1}^{j} \cdot \sum_i \left\{ \left(\frac{X_{t-1}^{ij}}{X_{t-1}^{j}} \right) - \left(\frac{\hat{X}_{t-1}^{ij}}{\hat{X}_{t-1}^{j}} \right) \right\} \cdot \left\{ \left(\frac{X_t^{ij}}{X_{t-1}^{ij}} \right) - \left(\frac{\hat{X}_t^{ij}}{\hat{X}_{t-1}^{ij}} \right) \right\} \rightarrow \textit{InteractionEffect}$$

CHAPTER 6

IMPORT PERFORMANCE

6.1 Introduction

We now turn to the analysis of Brunei's import performance of the different types of commodities that we looked at in the last chapter. There are two objectives of this chapter. First, we want to investigate the performance of each of those locally produced commodities in terms of its capability to meet domestic demand, through the calculation of its import penetration ratio. Secondly, using the shift and share method we seek to find out the performance of Brunei's imports relative to other countries.

The chapter has the following sections. Section two will give a summary of Brunei's tariff structure. Section three will discuss the structure of Brunei's imports and import markets. Section four gives the main findings of the shift and share analysis. Section five concludes.

6.2 The Structure of Tariff

As we recall from the last chapter, it was only in the Fifth National Development Plan (1986-90) that the Brunei government made a statement about the adoption of export-oriented and import-substitution industrialization as strategies for its

economic diversification policy. While a number of industries were identified[34] in the National Development Plan, no explanation was given to describe the adopted strategies in detail. Neither it is possible to find any evidence from the tariff structure that Brunei has actually implemented an import-substitution policy mentioned in the Development Plans.

The current custom tariffs which are based on the Custom Import Duties Order 1973, have never been amended to accommodate any import-substitution strategy. The first amendment made in 1992 was, in fact, to reduce and eliminate the tariff rates of various products. To date, a total of 1,628 tariff lines have either been reduced or eliminated.

We have compiled the tariff data for Brunei from a number of different sources. To give an overview of the structure of tariffs, we compress and present the data in Table 6.1 which shows the structure of simple average applied tariffs from 1973 until the present for the commodities we have identified as Brunei's potential products. The years we have chosen (i.e. 1992, 1996 and 2005) are the years in which the amendments were made.

[34] The industries were agriculture, food processing and manufacturing, furniture, cement, chemical and dyes and plywood and wood paneling.

Table 6.1

Brunei's Average Applied Tariff Rate for Different Group of Products

SITC	Commodity	1973	1992	1996	2005
03	Fish, crustacean and molluscs	0%	0%	0%	0%
07	Coffee, tea, cocoa, spices*	5%	5%	5%	5%
21	Hides, skins and fur skins, raw	10%	1.45%	1.45%	1.45%
25	Wood, Pulp and Paper Products	20%	7.58%	7.58%	7.58%
27	Crude fertilizer and crude minerals	0%	0%	0%	0%
28	Metalliferous ores and metal scrap	0%	0%	0%	0%
62	Rubber manufactures	10%	1.53%	1.18%	1.18%
65	Textile yarn, fabrics, made-up articles	11.4%	8.99%	1.02%	1.02%
67	Iron and steel	0%	0%	0%	0%
69	Manufactures of metals	0%	0%	0%	0%
84	Articles of apparel and clothing accessories	11.4%	8.99%	1.02%	1.02%
87	Professional, scientific, controlling instruments	20%	20%	20%	20%
Weighted Average of All Goods		13.00%	5.76%	5.96%	3.26%

* Coffee and tea are also subject to specific tariff.
Source: Own calculations.

What we can observe from Table 6.1 is that Brunei's trade policy has always been open. The overall average tariff rate, weighted by the import shares, in 1973 was estimated at 13 percent which has now fallen to about 3.26 percent. It can also be shown that Brunei does not even adopt the effective protection rate[35] measure as a strategy to develop its domestic industries. For example, Brunei has imposed high

[35] The effective rate of protection measures the net protective effect of any product due to the structure of protection (tariff) on both its inputs and outputs. Overall tariff structure has both a tax and subsidy element. Tariffs on the final goods operate as a subsidy whereas tariffs on imported inputs operate as a tax. If the tariff rate on the final good exceeds the tariff rate on the imported inputs, the effective protection rate is positive. On the other hand, if the tariff rate is higher for the imported inputs than the final goods, the effective rate of protection is negative, leaving the particular industry worse-off as a result of protection. It is, however, impossible to calculate the effective protection rates for industries in Brunei because their calculations require information from the input/output tables which would provide the share values of imported inputs in the production costs. Unfortunately, Brunei does not have any input/output tables. For literature on effective protection see, for example Corden (1966), Balassa (1968) and Greenaway and Milner (2003).

tariff on 'hide, skins and fur skins (SITC 21)' and 'textile yarn and fabrics (SITC 65)', both of which are inputs to the production of 'articles of apparel and clothing accessories (SITC 84)', which also has similar tariff rate as its inputs.

While Brunei's tariffs appear to be comparatively low, a number of imports are subject to non-tariff barriers such as licensing requirements, restrictions and prohibitions. On the basis of health, safety and security protection, imports of opium, firecrackers, vaccines from China and arms and ammunition are prohibited. Products subject to import restrictions include rice, sugar, salt, rice, beef, poultry, plants and live animals and converted timber, of which no explanation is given as to why they were being restricted. Import licenses are required for telecommunication equipment, medical products, chemicals and live plants and animals. For the full list of items included in the non-tariff barriers, see Table A6.1 in the Appendix.

Interestingly, we find a few instances when Brunei had attempted to protect its domestic production using non tariff barriers. In the mid 1990s Brunei imposed a ban on import of cement and roofing materials, two of the emerging industries. The ban was however lifted in the year 2000 due to the shortages of supply.

Meanwhile, Brunei's commitments to a number of regional trade agreements such as the ASEAN Free Trade Area (AFTA), the ASEAN-China Free Trade Agreement (ACFTA) and the Asia Pacific Economic Cooperation (APEC) which call for the elimination of tariffs and non-tariff barriers among member countries, have made Brunei one of the freest countries in the region.

6.3 Import Structure

In the last two chapters, we have identified a number of different types of commodities which are Brunei's main non-oil products and exports. These are 'fish, crustacean and molluscs', 'coffee, tea, cocoa, spices'; 'hides, skins and furskins'; 'wood, pulp and paper paper'; 'crude fertilizer and crude minerals'; 'metalliferous ores and metal'; 'rubber manufactures'; 'textile yarn and fabrics'; 'iron and steel'; 'manufactures of metals'; 'articles of apparel and clothing accessories' and 'professional, scientific, controlling instruments'. We have also identified the main potential export markets for these products and they are Singapore, Malaysia, UK, US, Australia, Japan, China, ASEAN and the EU. In addition, we also identified the different high potential commodity/market combinations which are summarised in Table 6.2 below.

Table 6.2
The list of Potential Product/ Market Combinations

SITC	Commodity	Potential Markets
07	Coffee, tea, cocoa, spices	Malaysia, Thailand and ASEAN
21	Hides, skins and fur skins, raw	Singapore and ASEAN
25	Pulp and waste paper	China and ASEAN
27	Crude fertilizer and crude minerals	China and ASEAN
28	Metalliferous ores and metal scrap	China and ASEAN
62	Rubber manufactures	China and ASEAN
67	Iron and steel	China, US
69	Manufactures of metals	Japan, China, UK, US, Australia and ASEAN
84	Articles of apparel and clothing accessories	Singapore, UK, US, Australia, EU and ASEAN
87	Professional, scientific, controlling instruments	China and ASEAN

Source: Own calculation

In terms of the shares of the identified commodities in Brunei's total import and their import market shares, we make the following observations. Firstly, the 12 types of commodities on average make up only 24 percent of Brunei's total

imports in the last 10 years. Whether this low import share is the result of the increase in the domestic production is a question we seek to answer in the coming section. Secondly, we find that the countries we have identified are also Brunei's main foreign suppliers of those commodities as can be seen from Table 6.3.

Table 6.3

The Average Import Market Shares of Different Types of Commodities, 1991-2003 (percent)

SITC	ASEAN	Singapore	Malaysia	EU	China	Japan	Australia	UK	US
3	85.13	34.07	37.08	1.36	2.11	2.09	2.13	0.53	0.95
7	77.19	26.25	45.75	6.56	2.75	0.06	8.18	1.56	2.14
21	26.11	26.57	3.37	0.00	0.00	0.00	0.00	0.00	0.00
25	91.36	58.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	74.35	36.46	31.34	13.86	4.48	0.20	3.31	0.61	3.19
28	79.63	50.11	10.91	0.00	0.00	2.24	0.00	1.19	1.83
62	32.89	22.83	5.90	14.07	2.40	29.75	1.28	6.29	13.31
65	49.27	32.61	13.46	7.16	5.61	1.54	0.39	1.98	2.17
67	46.03	28.22	12.45	12.70	2.65	16.69	0.85	3.82	8.82
69	46.64	16.37	12.04	21.48	2.94	5.69	2.17	6.06	15.01
84	70.21	31.74	16.87	6.55	3.43	0.52	0.39	4.39	1.11
87	21.89	18.69	2.41	28.84	0.33	1.91	1.97	11.59	33.47

Source: Own Calculations

Definitions:
SITC 03: Fish, crustaceans and molluscs; SITC 07: Coffee, tea, cocoa and spices;
SITC 21: Hides, skins and fur skins, raw; SITC 25: Wood, pulp and waste paper;
SITC 27: Crude fertilizer and crude minerals; SITC 28: Metalliferous ores;
SITC 62: Rubber manufactures; SITC 65: Textile yarn, fabrics and articles
SITC 67: Iron and steel; SITC 69: Manufactures of metals;
SITC 84: Apparel and clothing accessories; SITC 87: Professional, scientific, controlling instruments

We can see from Table 6.3 that Brunei's import of each type of commodity comes from almost all of the markets with the exception of some commodities such as 'hides and skins', 'wood, pulp and paper' and 'metalliferous ores', which only come from a few markets. ASEAN as a group appears to be Brunei's main foreign supplier for all of the commodities except 'professional and scientific instruments' where the US and the EU have bigger shares that ASEAN. Singapore remains Brunei's main ASEAN partner, followed by Malaysia. Meanwhile, other

non-ASEAN countries that have high shares in some of the commodities are Japan for 'rubber manufactures' and 'iron and steel'; the EU for 'hides and skins', 'rubber manufactures', 'manufactures of metals' and 'professional and controlling instruments'; the US for 'rubber manufactures', manufactures of metals' and 'professional and controlling instruments'. We look at the share of each of these imports in the domestic market in the following section.

6.4 Import Penetration

The import penetration ratio, defined as the ratio of total imports to domestic demand, shows the extent to which the demand for goods is being met by imports rather than from domestic production. Import penetration ratios are sometimes interpreted as indicators of trade protection policies: low import penetration ratios are seen as indicating that a country is using high import duties or non-tariff barriers to protect domestic producers, to the detriment of consumers who may prefer to purchase lower-priced goods or services from abroad. On the other hand, it can also be used as the basis of policy objectives targeting self-sufficiency (United Nations, 2007). It is calculated as:

$$\frac{M}{D} = \frac{M}{GDP - X + M} \times 100$$

Where M is imports, D is domestic demand and is calculated as GDP minus exports plus imports. The value ranges from 0 (completely self sufficient) to 100 percent when all domestic demand is satisfied solely by imports.

We calculate the import penetration ratio for each of the commodities. Now, because of the unavailability of national published data in Brunei, we resort to a number of alternative sources. These include the use of the United Nations Standard International Trade Classification (SITC) revision 3 at the 2 digit level for the classification of the different commodities for the years 1991 to 2003. Our data are from the United Nations Commodity Trade Statistics Database (COMTRADE) available from their website. For some of the missing data unavailable from COMTRADE, we compile raw trade data from Brunei's Department of Economic Planning and Development, and we sort them into the appropriate SITC groups of products, with the help of the United Nations notes on the conversion of data. Brunei's GDP value added from the Department of Economic Planning and Development is available only from 1985. The results are shown in Table 6.4.

Table 6.4: Import Penetration Rates, 1985-2003 (percent).

	03	07	21	25	27	28	62	65	67	69	84	87
1985	46.44	58.93	0.01	0.31	21.51	7.50	95.96	92.93	99.42	75.03	34.54	93.45
1986	50.07	64.95	0.18	0.99	25.30	3.84	99.54	99.05	99.93	81.46	34.39	92.10
1987	45.46	61.91	0.01	1.26	14.60	0.83	99.84	96.26	99.44	80.11	38.86	92.74
1988	47.78	65.82	0.01	0.03	15.45	0.90	100.00	96.45	99.50	90.69	38.77	92.81
1989	46.43	66.31	0.00	0.04	14.45	3.92	99.42	97.20	99.54	92.81	41.06	94.82
1990	45.83	64.24	0.01	0.02	18.05	3.11	99.99	98.94	99.77	95.27	42.76	94.65
1991	45.01	64.68	0.58	0.16	16.41	2.68	97.22	97.19	99.65	95.74	45.16	97.25
1992	46.46	63.93	0.07	0.25	27.36	2.85	98.75	97.80	99.49	92.45	41.33	89.17
1993	47.90	62.92	0.06	0.06	17.75	0.57	99.68	98.67	99.83	97.03	43.60	98.69
1994	57.20	69.82	0.01	2.23	38.43	0.58	99.06	98.59	99.88	96.19	39.56	89.61
1995	46.33	63.33	0.03	1.07	37.91	0.39	99.18	98.92	99.21	97.88	31.12	95.88
1996	45.60	61.53	0.06	4.48	50.53	3.81	99.01	98.88	99.11	96.77	37.02	93.79
1997	46.55	68.24	0.09	7.84	49.77	4.54	98.66	99.21	99.08	97.16	42.83	89.83
1998	38.06	60.88	0.01	2.68	32.41	1.83	99.10	98.24	99.86	92.03	31.95	87.44
1999	42.28	64.66	0.02	5.25	19.44	3.42	96.36	98.23	99.46	83.53	24.31	84.10
2000	40.19	63.14	0.01	2.71	13.93	1.76	99.05	98.03	99.01	88.75	19.73	79.47
2001	33.35	64.69	0.00	0.41	9.68	0.66	94.08	99.93	99.72	86.68	24.02	83.06
2002	30.50	64.29	0.00	0.90	12.31	0.14	90.08	96.55	98.61	91.90	18.89	84.64
2003	19.70	62.56	0.00	1.18	8.66	0.22	99.23	97.37	99.26	99.70	21.03	84.18

Source: Own calculations

Definitions:
SITC 03: Fish, crustaceans and molluscs;
SITC 07: Coffee, tea, cocoa and spices;
SITC 21: Hides, skins and fur skins, raw;
SITC 25: Wood, pulp and paper;
SITC 27: Crude fertilizer and crude minerals;
SITC 28: Metalliferous ores;
SITC 62: Rubber manufactures;
SITC 65: Textile yarn, fabrics and articles;
SITC 67: Iron and steel;
SITC 69: Manufactures of metals;
SITC 84: Apparel and clothing accessories;
SITC 87: Professional, scientific, controlling instruments

Our results show that the commodities can be categorised into three types. 'Hides, skins and fur skins (SITC 21)', 'wood, pulp and paper (SITC 25)', 'crude fertilizer and crude minerals (SITC 27)' and 'metalliferous ores (SITC 28)' can be put into one category characterised as having low import penetration ratios throughout the period of study. The second category, which has always had a very high import penetration ratio, is made up of 'coffee, tea, cocoa and spices (SITC 07)', 'rubber manufactures (SITC 62)', 'textile yarn, fabrics and made-up articles (SITC 65)', 'iron and steel (SITC 67)', 'manufactures of metals (SITC 69)' and 'professional, scientific and controlling instruments (SITC 87)'.

The most interesting group is the one that shows a decreasing import penetration ratio and consists of only two products, 'fish, crustaceans and molluscs (SITC 03)' and 'articles of apparel and clothing accessories (SITC 84)'. Given the low tariff rates accorded to these two commodities and the lack of other forms of protection would seem to indicate that the declining import penetration rate is the result of an increasing domestic production.

6.5 Shift and Share Analysis

We now look at the import performance of each of the commodity groups relative to the performance of other countries around the region, in Brunei's main foreign supply markets namely ASEAN, Singapore, Malaysia, EU, China, Japan, UK, US and Australia.

Following the argument made by Green and Lutz (1980) we should expect a negative net shift in the imports of those products that had a positive export performance in the last chapter. According to them, this is because a positive export performance implies an increase in the competitiveness of the industry which results in domestic prices become cheaper and therefore imports decline.

On the other hand, a positive performance in the import of a product group implies an increasing import share. If the positive import net shift is accompanied by a negative export performance, then we can draw the conclusion that Brunei does not have competitiveness in that particular commodity group.

We use the same shift and share analysis we used in the last chapter, which uses the national growth methodology of Esteban-Marquillas (1972) and combines it with the dynamic version of Barff and Knight (1988). We calculate the 'net shift' or 'import differential' for Brunei and other countries as the reference economies. Following the last chapter, these countries are Malaysia, Singapore, Thailand, Indonesia and the Philippines. The 'net-shift' is decomposed into three additive factors; the industry mix effect (IME), the competitive effect (CE) and the interaction effect (IE). The 'net-shift' equation is given below:

$$id_{ij} = di_{ij} - s_{ij} = r_{i0}\left(i_{ij} - i'_{ij}\right) + i'_{ij}\left(r_{ij} - r_{i0}\right) + \left(i_{ij} - i'_{ij}\right)\left(r_{ij} - r_{i0}\right) \qquad (6.1)$$

Where di = import growth;

i= import category;

j = a reference country;

s = share effect or the national growth component;

r_{i0} = growth of imports of commodity *i* of the reference group *0*;

r_{ij} = growth of imports of commodity *i* of each reference country, *j*;

i_{io} = imports of commodity *i* from the reference group *0*;

i_{oj} = total imports from a reference country, j; and

i_{00} = total imports from the reference group, *0*.

A positive value for the net shift implies an increasing import share. The industry mix effect shows how much of the net shift is due to the difference in the structure of each country and the reference group. On the other hand, the competitive effect shows how much of the net shift is due to the difference between the import growth of each country and the group as a whole. And finally, the interaction term gives the combined effects of the structural difference (industry mix) and the growth effect (competitive effect).

Our results of the shift and share analysis are reported in Tables 6.5, 6.6 and 6.7 respectively. Although the shift and share technique allows us to compare the performance for Brunei with other countries, we will only discuss the results for Brunei. Our objectives are to look for an inverse relationship between export and import of each commodity and also to look for inverse net shifts. We report the average growth rates over the whole period, from 1991 to 2003.

We first look at the results of the net shift and its decomposition for each import from the global market which can give us an overview of the performance of each type of commodity. Table 6.5 gives the net shift of each commodity and its

decomposition into industry-mix effect, competitive effect and the interaction effect. For ease of comparison, we also provide the corresponding export result in the parentheses below each import result.

Table 6.5

The Decomposition of the Net Shifts for Brunei's Imports into Positive and Negative in the Global Market, 1991-2003 (US$ Million)

Commodity	NS	IME	CE	IE
Pulp and paper (25)	-0.58 (-0.02)	-0.77 (-0.18)	27.02 (1.21)	-26.83 (-1.04)
Rubber manufactures (62)	-0.02 (-0.59)	0.24 (-0.59)	-0.25 (-0.29)	-0.01 (0.29)
Hides, skins and fur skins, raw (21)	-0.02 (-0.12)	-0.02 (-0.25)	-0.04 (1.53)	0.04 (-1.40)
Metalliferous ores and metal scrap (28)	0.19 (-0.22)	-0.55 (-0.45)	3.36 (-0.08)	-2.62 (0.31)
Coffee, tea, cocoa, spices (07)	0.69 (-0.12)	0.89 (-0.25)	-0.16 (1.53)	-0.04 (-1.40)
Articles of apparel and clothing accessories (84)	0.92 (55.62)	0.59 (0.45)	-0.13 (4.82)	0.45 (50.34)
Fish, crustacean and molluscs (03)	2.79 (-0.54)	0.25 (-0.60)	0.79 (0.56)	1.76 (-0.50)
Iron and steel (67)	3.39 (-1.45)	1.38 (-2.15)	-1.09 (-0.06)	3.09 (0.76)
Crude fertilizer and crude minerals (27)	8.45 (-0.11)	0.57 (-0.21)	1.12 (0.85)	6.75 (-0.75)
Textile yarn, fabrics, made-up articles (65)	10.77 (96.96)	-0.85 (-1.36)	5.22 (23.29)	6.40 (75.02)
Manufactures of metals (69)	10.96 (5.90)	5.04 (0.52)	-0.89 (1.21)	6.81 (4.16)
Professional, scientific, controlling instruments (87)	57.39 (-1.00)	1.29 (-0.71)	12.58 (-0.62)	43.52 (0.33)

Source: Own Calculations. Note: Figures in parentheses are exports' results.

We rank the results from the most negative value of import's net shift into the highest positive value. Our results show that 'wood, pulp and paper', 'rubber manufactures' and 'hides and skins' are the only commodities that record negative

net shift over the years. However, the export results for these commodities also show a negative net shift.

Now if we turn our analysis to those commodities that record a positive net shift, we can see an inverse relationship exists between import and export of many of these commodities including 'metalliferous ores (SITC 28)', 'coffee, tea, cocoa and spices (SITC 07)', 'fish, crustaceans and molluscs (SITC 03)', 'iron and steel (SITC 67)', 'crude fertilizers and crude minerals (SITC 27)' and 'professional and scientific instruments (SITC 87)'. This inverse relationship, in the different direction, could imply a weak competitiveness of these products especially for 'metallifeous ores (SITC 28)' and 'professional and scientific instruments (SITC 87)' that have recorded a positive CE in the import shift and share and a negative CE in their corresponding export results.

The two commodities that have shown a declining import penetration in the last section, 'apparel and clothing accessories (SITC 84)' and 'fish, crustacean and molluscs (SITC 03)' however, show positive import net shifts. Interestingly, however, the value of the net shift value for 'apparel and clothing accessories (SITC 84)' is a lot less than the net shift value of its export. And the positive import net shift is the result of the industry-mix effect and not the competitive effect. This means our earlier observation of its potential in Brunei economy is still valid.

Our second product, i.e. 'fish, crustacean and molluscs (SITC 03)' on the other hand, does not show a favourable outcome, with all three effects showing a positive sign.

We now turn to the results of net shifts for each commodity from each of the different suppliers which can be seen in Table 6.6. For ease of comparison we also provide the net shifts of exports of the relevant product/market combinations (in parentheses).

We are most interested in seeing the existence of the inverse relationships (a positive export net shift and a negative import net shift). Our results show that this occurs only for 'articles of apparel and clothing accessories (SITC 84)' from Singapore and the US, implying Brunei's competitiveness in those markets. Nevertheless, negative import net shifts can also be found for a number of product/market combinations for example, 'metalliferous ores (SITC 28)' and 'wood, pulp and paper (SITC 25)', for all markets.

We then look at the decomposition of the net shifts in the various markets given in Table 6.7. For ease of interpretation, we only give the sign of each effect. For full results, see Table A6.2 in the Appendix.

Table 6.6

The Net Shift Effect for Brunei's Import of Various Types of Commodities in Various Markets, 1991-2003 (US$ Million).

	SITC 03	SITC 07	SITC 21	SITC 25	SITC 27	SITC 28	SITC 62	SITC 65	SITC 67	SITC 69	SITC 84	SITC 87
Asean	2.26 (-0.54)	0.57 (-0.12)	-0.07 (-0.12)	-0.13 (-0.02)	7.85 (-0.11)	-0.35 (-0.22)	-0.01 (-0.59)	4.34 (96.96)	6.02 (-1.45)	0.47 (5.90)	0.74 (55.62)	1.47 (-1.00)
Singapore	0.07	-0.02	Na (0.02)	Na	0.19	-0.21	0.22	0.33	0.45	5.29	-0.01 (66.02)	149.57
Malaysia	0.12	1.58 (0.16)	-0.01	-0.09	4.81	0.02	0.02	3.34	8.33	34.61	0.39	-0.01
EU	-0.00	1.13	Na	Na	0.83	Na	-0.08	1.17	3.23	21.25	0.06 (0.50)	20.78
China	-0.06	-0.00	Na	-0.00	2.51	Na	-0.09 (-0.13)	3.91	2.04	-0.12 (-0.05)	-0.2	0.08 (-0.73)
Japan	0.67	-0.00	Na	Na	-0.00	-0.04	-0.23	0.18	12.17	3.72 (-3.66)	0.00	-0.73
Australia	0.08	0.00	Na	Na	0.57	Na	0.00	0.21	0.21	1.75 (0.10)	0.00 (-0.04)	0.22
UK	-0.01	-0.00	Na	Na	2.23	-0.52	0.24	0.39	1.23	1.19 (0.22)	0.04 (0.83)	0.2
US	0.07	-0.02	Na	Na	0.19	-0.21	0.22	0.33	0.45	5.29 (-0.05)	-0.01 (27.87)	149.58

Source: Own calculations

Note: Figures in parentheses are export results.

Definitions:

SITC 03: Fish, crustaceans and molluscs;
SITC 07: Coffee, tea, cocoa and spices;
SITC 21: Hides, skins and fur skins, raw;
SITC 25: Wood, pulp and waste paper;
SITC 27: Crude fertilizer and crude minerals;
SITC 28: Metalliferous ores;
SITC 62: Rubber manufactures;
SITC 65: Textile yarn, fabrics and articles;
SITC 67: Iron and steel;
SITC 69: Manufactures of metals;
SITC 84: Apparel and clothing accessories;
SITC 87: Professional, scientific, controlling instruments.

Table 6.7

The Decomposition of the Net Shifts for Brunei's Import by SITC Category and Destination, 1991-2003 (US$ Million)

	Fish, Crustaceans and Molluscs (SITC 03)				Coffee, Tea, Cocoa and Spices (SITC 07)				Hides, Skins and Fur skins, Raw (SITC 21)				Wood, Pulp and Paper (SITC 25)				Crude Fertilizers and Crude Minerals (SITC 27)				Metalliferous Ores (SITC 28)			
	NS	IM	CE	IE	NS	IM	CE	IE	NS	IM	CE	IE	NS	IM	CE	IE	NS	IM	CE	IE	NS	IM	CE	IE
ASEAN	+	+	+	+	+	+	-	+	-	-	-	+	-	-	+	-	+	+	+	+	-	-	-	+
Singapore	+	+	-	-	-	+	-	-	-	-	-	+	-	-	+	+	+	+	+	+	-	-	-	+
Malaysia	+	+	-	+	+	+	+	+	-	-	-	+	-	-	-	+	+	+	-	+	+	-	+	-
China	-	+	-	+	-	-	-	+	Na	Na	Na	Na	Na	Na	Na	Na	+	-	+	+	Na	na	Na	Na
Japan	+	-	+	+	-	+	-	+	Na	na	Na	Na	Na	na	Na	Na	-	-	-	+	-	-	-	+
EU	-	-	-	+	+	-	+	+	Na	Na	Na	Na	Na	Na	Na	na	+	+	-	+	Na	Na	Na	na
UK	-	+	-	+	-	+	-	+	Na	Na	Na	Na	Na	na	Na	Na	+	-	+	+	-	-	-	+
US	+	+	+	-	-	+	-	-	na	na	Na	Na	Na	Na	Na	Na	+	-	+	+	-	-	-	+
Australia	+	-	+	+	+	+	-	-	Na	Na	Na	na	Na	Na	Na	Na	+	+	+	+	Na	Na	Na	Na

	Rubber Manufactures (SITC 62)				Textile Yarn, Fabrics and Made-up Articles (SITC 65)				Iron and Steel (SITC 67)				Manufactures of Metals (SITC 69)				Apparel and Clothing Accessories (SITC 84)				Professional, Scientific and Controlling Instruments (SITC 87)			
	NS	IM	CE	IE	NS	IM	CE	IE	NS	IM	CE	IE	NS	IM	CE	IE	NS	IM	CE	IE	NS	IM	CE	IE
ASEAN	-	+	-	-	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	+	+	-	+	+
Singapore	-	+	-	+	+	+	+	+	+	+	-	+	-	+	-	-	-	+	-	+	+	-	+	+
Malaysia	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-	-	+	-
China	-	-	-	+	+	+	+	+	+	-	+	+	-	+	-	+	-	-	-	+	+	-	+	-
Japan	-	+	-	-	+	+	+	-	+	-	+	+	+	-	+	+	+	+	-	+	-	-	-	+
EU	-	-	-	+	+	+	+	+	+	+	-	+	+	-	+	+	+	-	+	+	+	+	+	+
UK	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	+	+	-	+	+
US	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+	-	-	-	+	+	+	+	+
Australia	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	-	-	+	+	+	+	+

Source: Own calculations

Again, here we are interested in the negative signs. A negative industry mix effect (IM) implies Brunei's declining share of imports of that particular product compared to the other countries in our study. Similarly, a negative competitive effect (CE) implies a slow import growth compared to the other countries, suggesting an increased competitiveness of the domestic product.

From the results we can see that the negative import net shifts of 'apparel and clothing accessories (SITC 84)' from some of the supply markets are due to negative competitive effect or industry mix effect. This can further confirm the competitiveness of this commodity. Some of the negative net shifts we find for 'fish, crustacean and molluscs (SITC 03)', 'coffee, tea and spices (SITC 07)' and 'rubber manufactures (SITC 62)' are mostly due to negative competitive effect rather than the industry-mix effect.

6.6 Conclusions

We calculate the import penetration ratio for the commodities we identified as having the potential to be developed. Our findings show that two commodities, 'apparel and clothing accessories' and 'fish, crustaceans and molluscs' have a declining ratio over the years. A few other commodities such as 'hides, skins and fur skins', 'wood, pulp and paper', 'crude fertilizers and crude minerals' and 'metalliferous ores' also appear to have low import shares.

We also adopt the shift and share analysis to look at the performance of Brunei's imports against a number of countries and also to look for the existence of an

inverse relationship between import and export of the commodities. Our results show that despite having low tariff rates, 'apparel and clothing accessories' has this inverse relationship in the Singapore and the US markets, further suggesting a competitiveness of this industry.

Despite Brunei's intention to adopt an import-substitution policy as a strategy to its diversification effort, we do not find any evidence that the policy has been implemented. The general low tariff rates have made Brunei one of the freest countries in the region and due to its commitments to some of the regional trade agreements, this position is unlikely to change in the future. The non-tariff barriers that Brunei imposes are mostly related to the protection of health, safety and environment. At one time, Brunei had to abandon its short attempt to protect a few industries such as cement and roofing, due to the shortages of supply. Our results also show that these commodities did not gain competitiveness.

There are, however, other forms of policy instruments that can be explored, not only that can be used to develop new industries but can also promote innovation. The latter, according to Hausmann and Rodrik (2004), is crucial for a country's future growth. Policies such as government loans and guarantee can help foster innovation by encouraging investment in new activities and can be used as a mechanism to reward successful innovators and push out the unproductive ones.

Nevertheless, whether or not the choice of trade policy actually matters to the process of diversifying Brunei economy is an interesting research question that needs further exploration.

APPENDICES TO CHAPTER 6

Table A6.1: Brunei's Non-Tariff Measures, 2005

Type of Non-Tariff Measure	Items included
Import prohibition. To protect health, safety, security and the environment .	• Opium and Java sparrows. • Pigs bred in or exported from Thailand. • Fabrics of tissues which bear the imprint of any currency, bank note or coins of any other countries. • Fire crackers. • Vaccines of Taiwan origin. • Arms and ammunitions. • Spirits and liquor. • Cough mixture containing codine. • Pens, pencils and other articles resembling syringes.
Import restriction	• Eggs for hatching purposes and fresh eggs unless they are clearly stamped with non-erasable ink. • Any living plant or planting material except from Sarawak and Sabah. • Live cattle and birds. • Pin tables, slot machines and any other tables or machines of a like nature. • Poisons and dangerous drugs. • Rice paddy and products. • Separated, skimmed or filled milk. • Persian glue. • Sugar. • Salt. • Converted timber. • Used motorcar, motorcycles, lorries, omnibuses, mini buses, tractors and trailers. • Any radio-active materials. • Alcoholic beverages. • Turtle eggs. • Broadcasting equipment. • Cigarettes unless with health warning written on the packages approved by the Minister of Health. • Any meat, poultry including carcasses of birds or any parts. • Any publication and printed materials.

Import permit/license	• Radio communication apparatus. • Wireless telephone. • Radio transmitter and transmitter receivers. • Aeronautical communication apparatus. • Maritime radio communication apparatus. • Telecommunications fixed line sets. • Arms, explosives, fireworks and fire crackers. • Timber Class 1A, 1B, 1C, Nibong, Rattans and converted timber. • Used or reconditioned vehicles. • Any kind of chemical substance. • Agricultural chemical. • Poison. • Vaccines. • Rice. • Sugar. • Salt. • Skimmed milk. • Living plants, live cattle, seeds for germinating, birds and any other animal. • Fruits and vegetables. • Any living insects, invertebrae animals in any stage of their life cycle. • Meat and meat products. • Fish and other marine products. • Prawn, crab, cuttlefish and kind of crustaceans and mollusces. • Piranha and arawana. • Fishing equipment. • Natural mineral water.

Table A6.2: Shift-Share Results for Brunei Import of Various Commodities and Various Markets (US$)

TOTAL		03	07	21	25	27	28	62	65	67	69	84	87
ASEAN	NS	2,263,412	574,490	-0.07	-130,881	7,858,598	-353,615	-14,170	4,343,288	6,025,477	468,851	744,859	1,476,76
	IME	398,522	727,578	-0.05	-181,695	3,363,151	-599,197	47,663	4,454	2,274,065	4,296,811	-21,820	-317,28
	CE	470,630	-312,259	-0.07	1,190,855	645,058	-105,209	-40,997	629,065	162,876	-1,301,846	303,890	1,032,41
	IE	1,394,260	159,171	0.07	-1,140,041	3,850,390	350,791	-20,837	3,709,769	3,588,536	-2,526,114	462,790	761,64
Singapore	NS	368,260	-13,546	-2,140	-124,769	4,986,135	-56,863	-1,690	3,782,845	1,807,783	-1,271,446	882,094	2,126,33
	IME	545,418	523,952	-1,628	-215,854	471,669	-70,507	69,629	70,594	1,652,179	1,968,851	188,609	-77,403
	CE	-25,311	-106,247	-7,555	13,002	349,382	-255,928	-94,907	428,433	-433,190	-3,793,891	43,372	936,191
	IE	-151,848	-431,251	7,748	5,708	4,165,083	269,572	23,588	3,283,817	588,794	-329,321	650,113	1,267,54
Malaysia	NS	122,949	1,578,824	-5,789	-99,256	4,807,774	19,378	21,972	3,336,844	8,325,416	34,613,188	398,798	-5,970
	IME	107,086	315,167	-5,818	-26,049	2,042,079	-10,739	8,666	-129,389	337,305	1,623,842	-12,854	-209,02
	CE	-34,926	103,904	-25,022	-160,187	-62,893	131,326	3,783	534,573	718,569	8,299,220	472,011	244,691
	IE	50,789	1,159,753	25,269	160,187	2,828,588	-101,209	9,523	2,931,660	7,269,542	24,690,126	-60,359	-41,639
China	NS	-61,111	-6,678	Na	Na	2,506,995	#DIV/0!	-98,959	3,905,279	2,035,069	-123,116	-204,894	82,123
	IME	-12,693	-16,674	Na	Na	-73,127	-41,822	-65,744	159,625	-1,358,929	41,715	-230,703	-245,96
	CE	-61,663	3,309	Na	Na	1,648,548	#DIV/0!	-76,293	2,226,677	1,909,336	-193,411	-10,644	1,317,46
	IE	13,245	6,687	Na	Na	931,574	#DIV/0!	43,078	1,518,976	1,484,661	28,580	36,453	-989,38
Japan	NS	676,252	-4,617	Na	Na	-4,569	-42,341	-233,336	185,013	12,173,028	3,716,844	2,703	-734,92
	IME	-9,944	-3,959	Na	Na	-7,850	-42,023	37,588	20,262	-358,064	-155,297	335	-662,82
	CE	354,196	-7,206	Na	Na	-35,855	-72,474	-184,853	421,923	5,584,903	2,091,901	-4,640	-908,70
	IE	332,000	6,548	Na	Na	41,406	74,889	-86,071	-257,172	6,946,189	1,780,240	7,008	836,60
EU	NS	-1,265	1,127,448	Na	Na	832,250	#DIV/0!	-79,458	1,170,941	3,231,721	21,248,986	66,845	20,781,4
	IME	-6,948	-56,233	Na	Na	62,229	-467,656	-11,399	17,988	82,434	-721,729	-75,781	179,76
	CE	-790	57,237	Na	Na	-16,046	#DIV/0!	-74,141	239,488	-153,832	3,735,212	29,352	8,706,91
	IE	6,473	1,126,444	Na	Na	786,066	#DIV/0!	6,082	913,465	3,303,118	18,235,503	113,274	11,894,7

(Table A6.2 continues overleaf)

(Table A6.2 continued)

TOTAL		03	07	21	25	27	28	62	65	67	69	84	87
UK	NS	-12,340	-5,948	Na	Na	2,226,527	-518,782	238,330	395,299	1,226,600	1,191,651	39,669	203,439
	IME	-8,776	800	Na	Na	-22,639	-523,592	49,531	4,085	-94,661	-130,400	17,824	-56,454
	CE	-14,954	-9,039	Na	Na	1,706,337	-854,016	22,556	213,262	744,443	81,969	-53,442	257,042
	IE	11,389	2,291	Na	Na	542,829	858,826	166,243	177,952	576,817	1,240,082	75,287	2,851
US	NS	74,760	-19,009	Na	Na	199,722	-213,261	220,542	332,973	447,594	5,298,344	-14,644	149,576,852
	IME	49,278	5,675	Na	Na	-86,656	-188,634	11,251	1,147	-189,094	623,158	-37,688	1,817,000
	CE	95,399	-17,789	Na	Na	73,718	-17,605	23,326	125,793	-18,100	333,073	-2,114	32,071,152
	IE	-69,917	-6,896	Na	Na	212,660	26,906	185,965	206,033	654,789	4,342,113	25,157	115,688,700
Australia	NS	87,311	6,787	Na	Na	579,158	#DIV/0!	9,995	206,571	208,179	1,747,502	9,808	220,418
	IME	-6,110	76,737	Na	Na	16,040	-139,255	175	3,559	-81,022	187,869	-13,235	1,168
	CE	41,455	-12,783	Na	Na	198,201	#DIV/0!	7,545	113,473	297,986	341,215	-5,056	134,378
	IE	51,967	-57,167	Na	Na	364,916	#DIV/0!	2,275	89,539	-8,785	1,218,418	28,099	84,872

Source: Own calculations

Definitions:

SITC 03: Fish, crustaceans and molluscs; SITC 07: Coffee, tea, cocoa and spices; SITC 21: Hides, skins and fur skins, raw;
SITC 25: Wood, pulp and waste paper; SITC 27: Crude fertilizer and crude minerals; SITC 28: Metalliferous ores;
SITC 62: Rubber manufactures; SITC 65: Textile yarn, fabrics and articles; SITC 67: Iron and steel;
SITC 69: Manufactures of metals; SITC 84: Apparel and clothing accessories;
SITC 87: Professional, scientific, controlling instruments.

CHAPTER 7

SUMMARY AND POLICY RECOMMENDATIONS

Brunei's intention to diversify the economy away from oil and gas became a national development objective since the beginning of the third National Development Plan in 1975. The continuing emphasis on diversification has resulted in the establishment of the Ministry of Industry and Primary Resources in 1989 with the responsibility of promoting and facilitating industrial development, not only to increase domestic production but also to increase non-oil exports. This was seen as a major policy initiative by the government to seriously diversify the economy.

This thesis investigates the extent of the outcome of the diversification efforts through the development of the non-oil trade. It also tries to identify the types of industries that can be promoted as a strategy for the diversification policy. Challenged with a serious lack of published data, we have adopted a number of non-parametric approaches to meet the objectives of this thesis.

In chapter two, we adopted the Herfindahl-Hirschman index to investigate the structural change in production and trade before and after the diversification policy in 1989. We found that the level of production concentration was declining even before the diversification policy was fully embarked on. The positive change in trade, however, only occurred in recent years. These results could imply the ineffectiveness of the policy in hastening the process of diversification.

Our findings in Chapter three reinforced the results in the previous chapter. Using the ARDL cointegration analysis on export and import demands, we examined the effects of two main diversification policies on the export and import of a number of product groups. We found that out of 12 groups of exports, only 'textile' group of products appeared to be significantly and positively affected by the policy. We also found that the exchange rate appeared to be an important determinant of the demand for exports and imports of a number of products. This has implications for the current Brunei-Singapore currency interchangeability arrangement.

In chapter four, we move our analysis to the comparative advantage of Brunei's non-oil products. We used the conventional Balassa index and Volrath index to calculate the present comparative advantage of Brunei's exports both in the world market and the ASEAN market. We then adopted Hausmann *et al* (2005) 'productivity' index that calculates the 'productivity level' associated with each export. Our results showed that Brunei appeared to show an increasing competitiveness in the garment industry. We continued our analysis using the decision-support model that allowed us to come up with 60 potential product/market combinations for Brunei's non-oil export. 20 of those combinations appear to be most realistic opportunities for Brunei.

Based on our results from chapter four, we focused our analysis on the export of each of the identified products and markets in chapter five. Our overview of Brunei's production and export incentives indicated that the incentives given were mainly in the form of tax holiday with very little subsidy or any other form of incentives. Using the shift and share analysis, we investigate the performance of

each export in each of the potential markets. We found that garment and metal exports have performed well in a number of markets, indicating the potential of these industries.

We conducted a similar analysis on imports in chapter six. But first we looked at the tariff structure of Brunei's imports and found that the overall tariff rates had always been low which seemed to contradict Brunei's strategy of increasing the production of import substitutes. We calculated the import penetration ratio of each product in order to assess the effects of protection, both in the form of tariff and non-tariff barriers. Interestingly, our results showed the two product groups that had a decreasing import penetration ratio were those that had low import tariff and non-tariff protection. They were fish and garments. We continued with a shift and share analysis and again found that garments had been the most competitive non-oil product.

Based on our results we can conclude that there has been some diversification of the Brunei economy but the process has not been rapid. The main outcome of this study, however, is the finding of a few potential industries to be developed. Garments, metal manufacturing and fish are the three industries that should be looked into that can help broaden the diversification of the economy.

While a small domestic market has often been cited as one of the main hindrances to the diversification process (Cleary and Shuang, 1994; and Asafu Adjaye *et al*, 1998), the rapid force of globalisation, which Brunei has also actively participated

in, should be able to offer some solution. The vast export opportunities we have shown in chapter four give an example.

In order to take advantage of the available export opportunities, there is a need for the government to enhance its efforts beyond the fiscal incentives and the provision of infrastructure. One key recommendation made by the World Bank (2007) was reducing bureaucracy and increasing transparency as the main strategy in the creation of a more conducive business climate. The latter is imperative not only for local businesses but also as the means to attract foreign investment into Brunei, the value of which, according to Amin (1998), is small compared to that received by other ASEAN countries. Another incentive that could stimulate the growth of the non-oil sector is the provision of financial assistance in the form of 'soft loans'. It is also important for the loans to be made available only to viable businesses in those industries that have been identified as having potential; and at the same time, the application criteria should not be made too restrictive, which could limit the number of potential businesses.

Given the size of Brunei, a tiny state with a small population and limited natural resources (apart from hydrocarbon), the government needs to be realistic in terms of its diversification ambition. Small states are naturally constraint by the size of their domestic markets and their domestic labours. However, Armstrong and Read (2003) have shown some empirical evidence that being small is not necessarily a hindrance to sustained economic growth and high levels of per capita income. To achieve such outcomes however require appropriate economic policies which are founded upon the particular strengths of the small states (comparative advantage)

that can limit the adverse effects of their small size. What this means to the diversification policy is that it should not be about promoting as many industries as possible, rather it needs to channel its limited resources into identifying and promoting industries based on their underlying comparative advantage.

Small states also need to specialize in activities that are less reliant upon scale economies and utilize human capital intensively. What this entails is the need for the government to identify the types of industries that it wants to promote. It needs to ensure that resources, in terms of the raw materials and inputs, are either readily available or easily obtainable from abroad, and that there will also be adequate human resources. Having said this, we therefore would like to stress that our results based on the Decision-Support Model however, should not be taken as ultimate and used as the sole export promotion decision. There are other economic and non-economic forces that can drive export development as we have discussed above. It is imperative for a cost and benefit analysis to be conducted on those industries to be given priority. These include the impact on local employment, income generation, future prospect of redevelopment and environment. The ultimate aim of economic development through the economic diversification is for the improvement in the welfare of the people without irreparable damage to the natural environment.

Of course, those who strongly believe in the efficiency of a free market will argue that no government intervention is required and that such intervention is likely to do more harm than good. But there are those who believe that the government can and should play a role in assisting economic change. The Ministry of International

Trade and Industry in Japan, for example, has played a strong role in coordinating the structural change in Japan in accordance with changes in the international competitiveness of Japan's industries. Kakazu (1994) in discussing the diversification of the Commonwealth of the Northern Mariana Islands (CNMI) says '*in order to diversify the CNMI economy good indicative planning with strong policy supports is essential. Policy measures must be designed to strengthen the competitive edge of local industries*'.

While we have focused on the goods sector, the service sector also presents Brunei with the potential with which to diversify the economy. One sector that comes to mind is tourism. Hailed as one of the world's largest industries, currently employing about 231 million people and generating about 10.4 percent of the world's GDP (World Travel and Tourism Council, 2008), and its growth is forecasted to continue, presents a huge potential to any country that is willing to actively participate. Tourism industry goes beyond the provision of job employment, the WTO describes the tourism industry as '*a powerful driver for many upstream and downstream economic sectors, thus making tourism independent and complementary to other sectors*' (WTO, 2003). Tourism sector in Brunei is still in its infancy (Tan and Tan, 2002). Faced with a number of challenges (see Sheikh Mohamed and Pang, 2002; and Tan and Tan, 2002), we note however the increasing efforts made by the government to promote tourism. These include the provision of a specific the budget allocation for tourism development in the eighth National Development Plan and in 2005, the Tourism Unit was upgraded into Brunei Tourism Board, a statutory body with wider powers.

There is scope for further analysis, including why the diversification effort has not been fruitful, and suggestions to improve it. First and foremost, based on our short review on the various policies and efforts in the introductory chapter, diversification seems to be seen as the pursuit of engaging the economy to as many non-oil activities as possible rather than identifying and promoting a few potential industries. Brunei needs to change this particular perception of economic diversification. In addition, there seems to be a lack of clarity in the strategies proposed. For example, the import-substitution strategy numerously mentioned in the National Development Plans appeared not to be supported by any trade policy. Similarly, no clear detail was given into Brunei's strategy of developing some of the targeted industries.

One aspect that relates to the success of the effort is the provision of human capital. It is imperative that the investment made on the human capital is of high quality. Unfortunately this is difficult to evaluate since the available and commonly used measures of education only reflect education inputs rather than outputs i.e. quantity rather than quality.

Meanwhile, issues such as the shortage of manual labourers, the high cost of local labour and their level of skills are also among some concerns for the prospect of diversification in this tiny state. The adoption of a flexible foreign workers policy needs to be continued especially in the areas where the supply of local labours is insufficient to meet the demand. Equally important is ensuring knowledge-transfer takes place from the high-skilled expatriates to the locals.

Our finding in Chapter 3 also seems to suggest that the exchange rate could be a tool in the diversification policy. Therefore, a cost and benefit analysis of the current monetary agreement between Brunei and Singapore would be useful in evaluating the effectiveness of the currency arrangement, especially in relation to the national objective of economic diversification. Even though one could argue that such monetary arrangement helps to prevent the Brunei dollars from an overvaluation. This however does not prevent Brunei from suffering the Dutch disease. According to Gylfason (2004) the Dutch disease can still strike in the countries that do not even have their own national currency. In this case, the natural-resource-based industry is able to pay high wages and high interest rates than other export industries, thus making it difficult for the latter to remain competitive.

Last but not least is the issue of how much oil is left. Brunei government has announced that the current reserve is depleting and is projected to diminish completely by the year 2033. This requires an energy policy that adopts an optimal depletion model which can ensure that revenues from the limited mineral resource can be enjoyed for a very long time and can help sustain the standard of living Bruneians are currently enjoying until the economy is no longer highly dependent on the oil and gas. Equally important is a policy on 'precautionary' saving for the current as well as the future generation. An oil fund, such as the Norway Petroleum Fund, is necessary if Brunei wants to last its oil wealth longer. The fund will also help to sterilize the petroleum revenues (Karl, 1999). What this means is that when prices are high, the excessive revenues can be placed in the

fund, thereby avoiding an overly rapid industrialization. It can also provide a necessary cushion to fall back on when prices are low.

To conclude, we would like to stress that the drive towards a diversified economy can only be accelerated when all parties, policy makers (political leaders), policy implementers (government bureaucrats) and policy shapers (academics, business leaders and the public), understand their roles clearly. Everyone should take note of the rapid changes that are taking place around the region and the world and should reap the opportunities presented in order to build a sustainable economic future for Brunei.

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