

CHAPTER 1

CHAPTER 1

INTRODUCTION

1.1 Background

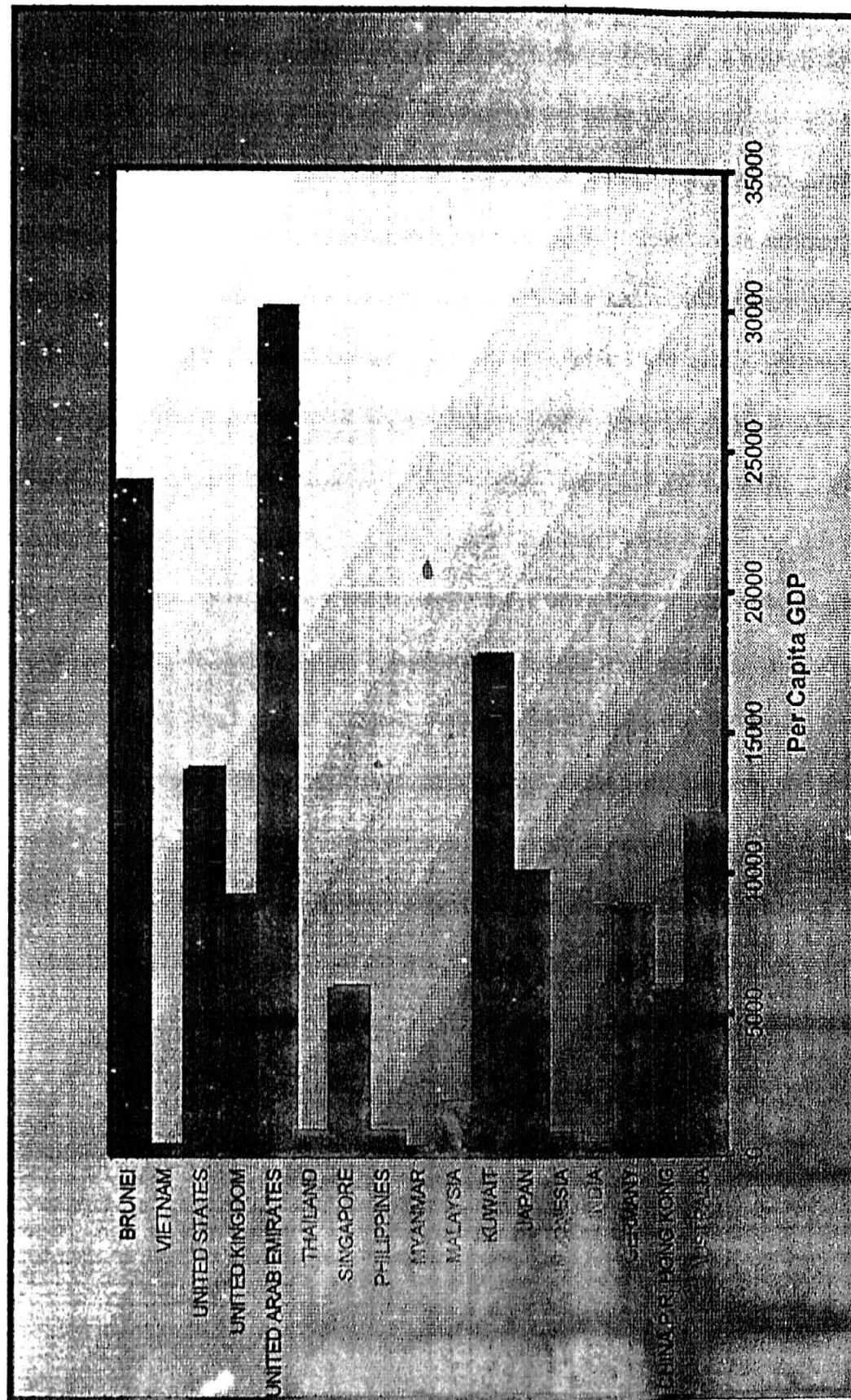
Soon after the discovery of oil in 1929 (followed by gas), Negara Brunei Darussalam (NBD) has emerged as one of the richest nations in the world¹. The 'revenue' received from this industry is distributed accordingly amongst development programs of the economy, explicitly spelt out in the Brunei Darussalam's National Development Plans (NDP). Since then, petroleum's contributions to Brunei's prosperity and economic growth have been significant and far-reaching to its population.

The economic growth is enhanced by the increase in the world's price of oil, which was in its highest in the early 1980's (highest in 1981 with US \$37.07 per barrel, see **Table 3.1** in **Chapter 3**) and this pushed NBD's nominal Gross Domestic Product (GDP) upwards and hence raised its per capita income making NBD as one of the richest countries in the world (This is true if one would measure the term 'rich' based on per capita GDP), exceeding those of the more developed as well as the fully developed or industrialized nations (see **Diagram 1.1**). However, such blessing of increasing world's oil prices comes with a 'price'². History has it that world's oil

¹ The production of oil was actually started in the early 1930s and exports began in the early forties.

² The oil-wealth has been considered as a 'double-edge sword' (Duraman, 1996) and a 'blessing and curse' by (Gelb, 1988)

at Current Prices (US\$)



Source: Taken from World Economic Outlook and Brunei Darussalam Statistical Yearbook, Various issues.

prices frequently³ – to a certain degree uncontrollable – fluctuating (see **Diagram 3.1** in **Chapter 3**). These fluctuations have had negative economic implications to nations that depended on petroleum for income, and NBD is one of the best examples of such blessed nation. Since NBD is depended on oil and gas industry – not only because it is the major export *per se* but ultimately because of its ‘revenue generating capability’⁴ – Brunei’s lifeline could be threatened at any time. It is therefore necessary for the government to set out plans and embark on new strategy to counter this expected but to a certain degree unanticipated and uncontrollable⁵ fluctuations which have inevitable negative consequences to the revenue and therefore to the economy of NBD.

The government has been undoubtedly putting serious efforts for a more diversified, more industrialized and a more sustainable economy. Several programs and projects have been approved and they are explicitly spelt out in the NDPs to achieve these goals. However, after decades of trying, the progresses have been somewhat minimal⁶. Despite improvements in a very few areas of the economy, oil sector is still is the dominant sector in the NBD’s economy, as suggested by figures produced in the latest Brunei Darussalam Statistical Yearbook. Thus, one may argue

³ It is fundamentally similar to ‘boy and girl’ relationship, where ups and downs are quite inevitable as well as frequent.

⁴ Brunei gets its revenue from oil and gas through dividend, royalty and tax.

⁵ OPEC has a greater influence on the price of oil since it has three-quarters of world’s oil production. They are other oil producing countries that also contribute significant shares to the world’s oil production. If oil price falls beyond the ‘reasonable’ level because of some economic shocks, OPEC may try single handedly to raise the price by cutting supply. This policy however, has its consequences to OPEC countries but benefiting those of the non-OPEC oil exporting countries. Thus, OPEC may try to persuade countries like Russia, who contributes 5% to world’s oil production, to cut oil supply. This was the case experienced in the mid 2002, where OPEC persuaded Russia to cut oil supply to increase price, but it did not.

⁶ On this point see Duraman (1997): 246-268, Duraman (1994): 45-65 and Haji A. W. Juned, (1993).

or at least imply, that NBD's economic policy, particularly in the area of diversification, has failed.

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The situation is expected not to ease out in the coming years and thus it is wise that the government gets the best use out of oil and gas before they eventually dried out⁷. With the potentially high per capita income attributed single handedly by the oil sector, the government may try to look at the possibility of increasing revenue through taxation.

In NBD, there have been very few works on taxation and how tax can be used as an important instrument to generate revenue. This and other factors may have been hindering the emphasis of increasing tax effort so as to get the most out of the high income per capita. With the exception of revenue collected from corporation income tax, which again contributed mainly by the petroleum sector, tax effort on the other types of taxation can be informally considered as 'slack'⁸.

Through casual observation, the burden of taxation here could be considered as lower than those in other countries⁹. But ultimately, the most distinctive feature of NBD's tax structure to other nations – or at least in the ASEAN region – is that there is no individual income tax. This will be looked at in detail later on. Income and buoyancy elasticity of tax revenue is of course a very important analysis in this

⁷ It is estimated that, in the absence of new discoveries, oil resources are expected to deplete by the year 2040.

⁸ This will be proved later on and also see Manan, (1995): 228.

⁹ The burden of taxation and excess burden of taxation are two different terms. Both will be explained separately in **Chapter 2**.

research. These and several other questions are needed to be exposed, and this research is hopeful to provide answers to these questions wherever possible.

The research paper will also be looking at the structure of tax in NBD and will suggest the possible policy recommendations to improve the current tax system based on the results of the analyses above. Though this might be too early to say anything explicit and concrete on the usefulness of this research, nevertheless, the apparent gain that could be obtained is the increasing options or alternatives for the policy makers to promote economic growth and development. Therefore, not only will it provide a clearer picture of how tax is operated, the importance of tax as well as the historical and current performance of tax in NBD, but also opening up new areas for 'cultivation'.

1.2 Objectives of the Study

- To describe and examine the structure of tax in NBD.
- To examine the trend of tax revenue, tax effort and tax reliance ratios, direct-indirect ratio, and tax burden for the period of 37 years. Comparison study will also be performed against other country groups.
- To estimate the buoyancy and income elasticity of tax revenue.
- In the end, this research will propose some policy recommendations to improve the current tax condition in NBD based on the analyses performed.

1.3 Scope of the Study

The study covers the area of revenue, specifically on tax, in NBD. Basically, this research will look at the process of taxation, how taxes are collected, who is in charge, the objectives of tax, the performance of tax and so many other concepts important in the operation of taxation in NBD. Several analyses shall be carried out to see how the 'Bruneian' tax has been performing, especially in the past 37 years. To do that, analyses such as the tax effort, tax reliance ratio, direct – indirect tax ratio, tax burden and the buoyancy and income elasticity of tax revenue are undertaken. Comparison study will also be performed against other country groups to see where NBD lies and this, to a certain extent, would give the policy makers the idea of how NBD fares with other countries. With these, a number of policy recommendations will be suggested to improve the current performance of taxation.

1.4 Research Methodology

1.4.1 Data Collection Techniques

Data collections are mostly based on secondary sources. This includes government's publications, books, unpublished materials, journals that can be found in the Universiti Brunei Darussalam, University of Malaya, NBD government departments and other possible sources.

1.4.2 The Estimation and Sampling Techniques

Buoyancy and Income Elasticity of Tax Revenue

Technically, estimating the buoyancy elasticity of tax revenue is simpler to that of estimating income elasticity. According to Asher and Booth (1983):

Tax revenues may change because of variety of factors, for example, discretionary changes in tax rate or base, changes in the efficiency of tax assessment and collection, or changes in income. In order to estimate income elasticity, historical tax series must be adjusted to eliminate the effects on tax revenues of all factors other than income. Thus, income elasticity may be defined as the ratio of the percentage change adjusted tax revenue to the percentage change in income. Buoyancy, on the other hand, refers to change in tax revenues that are due not only to changes in income but also to discretionary changes.

Thus, income elasticity of tax revenue measures the responsiveness of tax revenue to changes in national income, with corrections of the discretionary changes in tax rates and structures occur within the period of study. Buoyancy elasticity of tax revenue, on the other hand, measures the responsiveness of tax revenue to national income, without corrections of the discretionary changes in tax rates and structures occur within the period of study.

There are several methods of adjustment from which income elasticity of tax revenue can be estimated. The most widely used adjustment procedures are the proportional adjustment method (PAM), the constant rate structure method (CRSM) and the dummy variable method (DVM)(Asher and Booth (1983)).

The PAM consists of two steps. First, actual tax revenues for a given year are adjusted to take account of estimates (usually official) of the effect (positive or

negative) of discretionary changes in tax rates or bases. The second step consists of refining the above adjusted tax revenue series by applying a formula to it. The CRSM method consists of estimating rate and base index for various years "in terms of the references year. Thus, in both the PAM and CRSM, an attempt is made to construct hypothetical revenue series which would have obtained had the reference year's tax structure been operation for the rest of the sample period. The DVM involves representing each discretionary change affecting tax revenues by a dummy variable. Thus, adjustment and estimation occur simultaneously, unlike the first two methods.

The three methods above have their own strengths and weaknesses and while some writers have argued in favor of one or the other method, in practice, the choice between the above methods is based on the availability of data and the feasibility of using a particular technique (Asher and Booth, 1983). In the case of NBD, DVM is thought to be appropriate and adequate not only because of its simple approach, but also because of the simultaneous adjustment and estimation yet necessary data are readily available¹².

Prior to estimation of the buoyancy elasticity, it is important to see its original functional form, and this is shown as,

$$TR_{it} = AGDP_t^{\beta_1} \quad (1.1)$$

In words, this is a nonlinear model in the independent variable *GDP*. Now, expressing this equation in an alternative, but equivalent, form, as follows:

¹² Obben & Manan (1996) used similar method because of similar reasons.

$$\ln TR_{it} = \ln A + \beta_1(\ln GDP_t) \quad (1.2)$$

Where,

- \ln = The natural log
- TR_{it} = Tax revenue with of i at time t
- GDP_t = Nominal Gross Domestic Product at time t
- $\ln A$ = Intercept
- β_1 = Estimation of buoyancy elasticity

Now, if we let

$$\beta_0 = \ln A \quad (1.3)$$

We can then write Equation (1.2) as

$$\ln TR_{it} = \beta_0 + \beta_1(\ln GDP_t) \quad (1.4)$$

And for estimating purposes, we can write this model as

$$\ln TR_{it} = \beta_0 + \beta_1(\ln GDP_t) + \mu_t \quad (1.5)$$

This is a linear regression model, for the parameters β and β enters the model linearly. Of course it is of interest that this model is also linear in the logarithms of the variables TR and GDP . Because of this transformation from nonlinear to linear via log, it is called double-log (since both variables are in the log form). And this is what we will be using to estimate buoyancy elasticity.

Similar approach is also applied to estimate income elasticity but with few modifications (eliminating the effect of discretionary changes that we have discussed earlier). To do that, let us first consider the changes in tax rate and base during the period of study in **Table 1.1** below,

Table 1.1:
The Change of Tax Rates and Bases

| Date | The Changes |
|------------|--|
| 15.01 1973 | Export duty was abolished |
| 1992 | Excise duty was discontinued in 1992 ¹³ . |
| 01.11.1994 | The increase of tobacco/cigarette duty from BND\$ 0.00 - BND\$ 10.00 per lb to BND\$ 30.00 – BND\$ 100 per Kgm. |
| 02.02.1995 | The increase of vehicle duty from 20% to 40%-200% according to vehicles category |
| 01.04.1995 | Decrease in tax for domestic goods, e.g. perfumes, decrease from 30% to 5% and the tariff of furniture, air condition, TV & Radio decrease from 20% to 5%. |
| 14.10.1996 | Elimination of tax on textiles and clothes |

Source: Royal Custom and Excise Department, Ministry of Finance, NBD

And so,

$$\ln R_t = \ln \beta_0 + \beta_1(\ln GDP) + \beta_2 D1 + \beta_3 D2 + \beta_4 D3 + \beta_5 D4 + \beta_6 (D1)(\ln GDP) + \beta_7 (D2)(\ln GDP) + \beta_8 (D3)(\ln GDP) + \beta_9 (D4)(\ln GDP) + \mu \quad (1.6)$$

Where,

¹³ It is thought that excise duty was abolished in 1992, but it was not (See **Chapter 4** for explanation). This, however, will not in any way affect our analysis and therefore, results.

| | | |
|------------|---|--|
| TR_{it} | = | Tax revenue of type i at time t |
| GDP_t | = | Nominal Gross Domestic Product at time t |
| β_0 | = | Intercept |
| β_1 | = | Estimation of income elasticity |
| β 's | = | Parameters to be estimated |

The descriptions of the four dummy variables in the model above are given in Table 1.2 below,

**Table 1.2:
The Dummy Variables**

| Dummy Variables | The Period | The Changes |
|----------------------|--|---|
| $D1 = 0$ $D1 = 1$ | For years 1965 – 1972 For years 1973 – 2001 | Export duty was abolished in 15.01.1973 |
| $D2 = 0$ $D2 = 1$ | For years 1965 – 1991 For years 1992 – 2001 | Excise duty was discontinued in 1992 |
| $D3 = 0$ $D3 = 1$ | For years 1965 – 1994 For years 1995 – 2001 | The increase in tax on tobacco/cigarette in 01.11.1994; the increase of vehicle duty from 20% to 40%-200% according to vehicles category on 02.02.1995; and Decrease in tax for domestic goods, e.g. perfumes decrease (from 30% to 5%) and the tax tariff of furniture, air condition, TV & Radio decrease from 20% to 5% on 01.04.1995. |
| $D4 = 0$ $D4 = 1$ | For years 1965 – 1996 For years 1997 – 2001 | Elimination of tax on textiles and clothes on 14.10.1996. |

Since it is found that some of the amendments are implemented within a year, it is felt appropriate that only one dummy variable is needed to isolate the respective discretionary changes. This is what we have done with dummy variable 3 or $D3$. If it is believed that the elasticity depends on a given discretionary change, interaction terms are needed in the regression equation to capture that effect, otherwise the interaction terms are not needed. If say β_6 turns out to be positive, it means that the growth of aggregate tax revenue might be increased by that much given that it is significant. This applies to other coefficients of interaction terms.

The variables to be included in these analyses dated back to 1965. The dependent variables include, income tax, licenses, import duty, excise duty, export duty, import duty and stamp duty. The independent variable is the Nominal GDP. Therefore, we have 37 years in our samples.

Data Sampling for Country Grouping

In **Chapter 5**, as alluded earlier, we will perform a comparison study of tax performances in NBD against other country groupings. Based on the country groupings standardized in the IMF publication called the Government Finance Statistics Yearbook (GFSY), countries are categorized into industrial countries and developing countries. The developing country group is further subdivided into Africa, Asia, Europe (excluding developed countries), Middle East and Western Hemisphere (which includes the Caribbean). For our purpose, two more country groupings are added, and these are ASEAN and Oil Exporting countries.

The format in which these data are furnished in the GFSY is not formatted in such a way suitable for the comparison. Thus, some very daunting calculations had to be performed. For the calculation of tax reliance ratios, it is necessitate that we must firstly look at the format of data found in the GFSY, and this is presented in **Table 1.3**. There are two immediate problems with these types of data. The first one is that, these data are not the tax reliance ratios, they are the ratios of tax to total revenue (see **Chapter 2** for explanation on tax reliance ratio). Thus, some adjustments have to be made. The second problem with these data is that the year within which each

Table 1.3:
The Country Grouping (Industrial Countries)

| Country group | Year | Taxes on Income, Profits, and Cap. Gains | Individ | Corpor. | Social Security Contrib. | Taxes on Payroll and Work Force | Taxes on Property | Domestic Taxes on Goods and Services | Gen. Sales Turnover or V.A.T. | Taxes on Internat. Trade and Transact | Other Taxes | Nontax Revenue | Entrep. And Property Income | Total Revenue |
|-----------------------------|------|--|---------|---------|--------------------------|---------------------------------|-------------------|--------------------------------------|-------------------------------|---------------------------------------|-------------|----------------|-----------------------------|---------------|
| Industrial Countries | | | | | | | | | | | | | | |
| United States | 2000 | 57.45 | 47.61 | 9.84 | 30.72 | - | 1.38 | 3.18 | - | 1.02 | - | 6.23 | 3.29 | 100 |
| Canada | 2000 | 53.30 | 39.16 | 12.27 | 20.51 | - | - | 16.25 | 12.35 | 1.25 | - | 8.65 | 6.49 | 100 |
| Australia | 1998 | 67.14 | 49.83 | 16.60 | - | 2.26 | - | 20.24 | 9.92 | 2.56 | - | 6.33 | 3.34 | 100 |
| Japan | 1993 | 36.16p | 23.72p | 12.45p | 26.48p | -p | 4.05p | 14.43p | 6.99p | 1.24p | 1.60p | 15.45p | 8.58p | 100 |
| New Zealand | 2000 | 61.28 | 44.80 | 11.93 | - | 0.89 | 0.06 | 28.40 | 19.74 | 1.85 | - | 6.84 | 4.10 | 100 |
| Austria | 1999 | 25.29 | | | 39.56 | 4.19 | 0.12 | 24.58 | | 0.02 | - | 5.94 | 1.75 | 100 |
| Belgium | 1998 | 36.75 | 28.72 | 8.00 | 32.94 | - | 3.39 | 25.21 | 19.72 | - | - | 1.62 | 0.55 | 100 |
| Denmark | 2000 | 35.32f | 27.13f | 5.50f | 4.06f | 0.54f | 1.65f | 44.85f | 27.99f | -f | 1.35f | 11.79f | 7.29f | 100 |
| Finland | 1998 | 29.11 | 21.79 | 7.32 | 10.36 | - | 2.18 | 43.83 | 26.33 | - | 0.14 | 13.16 | 3.97 | 100 |
| France | 1997 | 19.34 | 14.34 | 4.94 | 41.16 | 1.41 | 1.97 | 28.23 | 19.16 | - | 0.63 | 6.07 | 1.34 | 100 |
| Germany | 1998 | 14.50 | 12.56 | 1.94 | 47.58 | - | 0.03 | 20.04 | 10.79 | - | - | 15.94 | | 100 |
| Greece | 1998 | 38.49 | 19.47 | 12.96 | 2.19 | - | 4.27 | 54.78 | 33.25 | 0.06 | 3.63 | 6.98 | 4.02 | 100 |
| Iceland | 1998 | 22.71 | 17.63 | 3.82 | 9.30 | - | 4.22 | 48.72 | 30.74 | 1.24 | 0.04 | 12.71 | 5.70 | 100 |
| Ireland | 1997 | 41.79 | 31.71 | 10.08 | 12.91 | 1.12 | 2.80 | 37.36 | 20.35 | - | - | 4.01 | 1.79 | 100 |
| Italy | 1999 | 36.95 | 29.01 | 6.83 | 30.86 | - | 1.66 | 24.79 | 13.96 | 0.01 | 0.94 | 6.89 | 3.69 | 100 |
| Luxembourg | 1997 | 33.47 | 19.41 | 12.97 | 24.78 | - | 7.27 | 25.65 | 13.37 | - | 2.86 | 8.18 | 5.33 | 100 |
| Netherlands | 1997 | 24.81 | 14.84 | 9.97 | 41.11 | - | 2.98 | 22.68 | 15.25 | - | 1.66 | 6.57 | 3.93 | 100 |
| Norway | 1998 | 21.19 | 12.47 | 8.72 | 22.46 | - | 1.01 | 37.49 | 22.18 | 0.56 | 0.01 | 17.08 | 14.41 | 100 |
| Portugal | 1998 | 26.53 | 15.98 | 10.38 | 24.62 | - | 0.24 | 35.94 | 21.46 | 0.01 | 2.16 | 9.70 | 3.28 | 100 |
| San Marino | 1996 | 25.75 | | | 19.27 | - | 0.68 | 31.78 | - | 1.40 | 0.72 | 19.86 | 12.46 | 100 |
| Spain | 1997 | 29.68 | 20.96 | 8.56 | 38.99 | - | 0.19 | 24.44 | 15.15 | 0.07 | - | 6.36 | 3.24 | 100 |
| Sweden | 1999 | 13.74 | 6.08 | 7.66 | 33.14 | 9.93 | 4.54 | 27.05 | 17.02 | 1.12 | 0.12 | 11.29 | 9.26 | 100 |
| Switzerland | 1999 | 12.90 | 8.37 | 4.53 | 51.05 | - | 2.87 | 25.14 | 16.14 | - | - | 6.85 | 4.98 | 100 |
| United King. | 1999 | 39.71 | 29.13 | 10.58 | 17.02 | - | 7.21 | 31.02 | 18.81 | - | - | 4.89 | 2.94 | 100 |

Source: Government Finance Statistical Yearbook, 2001

Notes: As we can see, the table shows types of revenue as percentages of total revenue. And also look at the year of the data for the countries. Other country groupings are not shown here.

individual country is furnished, in most cases, differ from one another. Some countries have the 2000 data but others have 1999 or earlier data. For our analysis, based on my own judgment and the availability of data, I decided to use the 2000 data. It is also decided or rather appropriate, that not all countries were included for a simple reason that it involved tedious and time-consuming manual calculations. For that reason, only 30 percent of the countries within each group will be selected. Because not all data are produced for the year 2000, another system of selection is designed. As an example, let us look at **Table 1.3** in the category of Industrial countries. Here, the total numbers of countries are 24. Thirty percent of these are seven and thus seven countries must be selected from this country grouping in alphabetical order as readily furnished in **Table 1.3**. However, only four of these countries have the 2000 data. Thus, we go backwards to the year 1999 to choose three more countries, and the selected countries are Austria, Italy and Sweden. Similar sampling procedure is also performed for the other country groupings except ASEAN and Oil Exporting countries¹⁴.

For the computation of the tax effort ratio, the same countries within the same groupings are chosen as those in the computation for tax reliance ratio. However, it is decided that the year for the data is 1997. The reason to this is because of the unavailability of data for some countries, whether the nominal GDP at domestic currency or the value of taxes, by type. In the IMF's GFSY, no GDP for countries are furnished and for this, I turned to United Nations' publications, which include National Account Statistics (1996/1997), Statistical Yearbook for Asia and the Pacific

¹⁴ In some cases, few adjustments had to be made because some data do not tally and thus some countries were left out and new ones were chosen.

(1998) and Statistical Yearbook for Latin America and the Caribbean (2001). Between these three books, priority was given to the National Account Statistics since most of the Nominal GDPs for individual countries are available here. Thus, when some figures do not tally, decisions were made to choose figures from the United Nation, unless otherwise stated.

Since the direct-indirect tax ratio and the tax burden are computed similar to tax reliance ratio and tax effort ratio respectively, the results of the previous calculations will be used. For more detail explanation on how to calculate the tax reliance ratio, tax effort ratio, direct indirect tax ratio and tax burden, these are furnished in **Appendix 1**.

1.5 Hypothesis

Obben and Manan (1996) shows that the discretionary changes to abolish export duty in 1973 and excise duty in 1992 had an adverse effect on the growth of aggregate tax revenue, albeit not significantly. It is estimated that total tax and direct taxes are both buoyant and elastic whilst all individual indirect taxes have buoyancy and income elasticity less than unity except for stamp duty. In this research paper, seven more years are added to the previous samples, and significantly within this short period of time NBD experienced quite a number of amendments (see **Section 1.4.2**). Thus, this addition of samples can be considered as legitimate and in fact can be beneficial if one would want to look at the 'changes' of the buoyancies and income elasticities with addition of samples with inclusion of the tax amendments occurred

within those additional samples. Since the results of earlier study reveal total tax and direct taxes are both buoyant and income elastic, and all individual indirect taxes have buoyancy and income elasticity less than unity except for stamp duty, similar results could be expected here. Thus, our hypotheses are:

- It is expected that total tax and direct taxes will continue to be buoyant and income elastic, that is, estimation values greater than 1.
- It is expected that all individual indirect taxes will continue to be less buoyant and income inelastic, that is, estimation values less than 1.

1.6 Literature Review

In NBD, there are very few works done on the field on taxation. In this literature review, we shall look at local work on NBD's revenue structure, in the area of estimation of buoyancy and income elasticity of tax revenue, the impact on car tax in 1995 and the impact of cigarette tax. Their findings and results are presented here together with a few relevant studies on tax in other countries.

1.6.1 Local Literature Review

There have been very few studies on tax with respect to NBD. In 1996, Obben & Manan did one study focused on buoyancy and income elasticity of tax revenue in NBD for the period between the year 1965 to 1994. Their study very much formed the basis for estimating the buoyancy and income elasticity of tax revenue in this research

paper. The buoyancy elasticity is estimated by using the double log model below (see the explanation in Section 1.4),

$$\ln T_{it} = A + \beta(\ln Y_t) \quad (1.7)$$

Where,

- T_{it} = Tax revenue of type i at time t
- Y_t = Nominal Gross Domestic Product at time t
- A = Intercept
- β = Estimation of buoyancy elasticity

To estimate income elasticity, they add two dummy variables with their respective interaction terms to equation (1) to obtain,

$$\ln T_{it} = A + \beta_1(\ln Y_t) + \beta_2 D1 + \beta_3 D2 + \beta_4(D1)(\ln Y_t) + \beta_5(D2)(\ln Y_t) \quad (1.8)$$

Where,

- TR_{it} = Tax revenue of type i at time t
- GDP_t = Nominal Gross Domestic Product at time t
- A = Intercept
- β_1 = Estimation of income elasticity
- β 's = Parameters to be estimated

The descriptions of the two dummy variables in the model above are given in Table 1.4 below,

**Table 1.4:
The Dummy Variables (1996's Study)**

| Dummy Variable | The Periods | The Changes |
|-----------------------|--|---|
| $D1 = 0$ $D1 = 1$ | For years 1965 – 1972 For years 1973 – 2001 | Export duty was abolished in 15.01.1973 |
| $D2 = 0$ $D2 = 1$ | For years 1965 – 1991 For years 1992 – 2001 | Excise duty was discontinued in 1992 |

Source: Obben J. & Manan J.Z. (1996)

The two equations are regressed and the results are presented in **Table 1.5** and **Table 1.6**. Their estimates reveal that total tax and company income tax, the sole direct tax in NBD, are buoyant and elastic. However, the total indirect tax revenue and its individual components (except stamp duty) are inelastic and have buoyancy less than unity. The elasticity measures are greater in magnitude than the corresponding buoyancy measures for the various tax categories. This implies that the discretionary changes to abolish export duty in 1973 and excise duty in 1992 had an adverse effect on the growth of aggregate tax revenue, albeit significantly.

There is one study that reviews the level and structure of taxation in NBD, and it performed a comparative analysis of revenue systems prevalent in other countries. In his study in 1996, Manan found out that the level of tax effort characterizing the NBD revenue system appeared to be somewhat 'low' relative to levels prevalent in other countries at comparable stages of economic development. In other words, the tax system showed a degree of 'slack' with respect to its taxable capacity. The implication being that there exists potential for 'improvement' in tax effort. He also revealed that the structure of taxation suggests a bias in favor corporate income tax. And in addition, he also found that the level of government finance exhibits a considerable degree of reliance on non-tax revenue.

**Table 1.5: Results of Regression Models Used
to Estimate buoyancy**

| Dependent Variables | Intercepts | Ln GDP | R ² | Adjusted R ² |
|------------------------------------|---------------------|---------------------|----------------|-------------------------|
| Direct tax ln DIRECTAX | -3.3264 (-8.36) | 1.2314 (24.88) | 0.9567 | 0.9552 |
| Indirect Tax ln INDIRTAX | -2.8059 (-5.84) | 0.78855 (13.21) | 0.8617 | 0.8567 |
| ln IMPTDUTY | -2.9386 (-6.21) | 0.79291 (13.48) | 0.8665 | 0.8618 |
| ln EXPTDUTY ^a | -3.1004 (-0.38) | -0.06672 (-0.05) | 0.0004 | -0.1662 |
| ln EXCIDUTY ^b | -5.8817 (-11.14) | 0.25721 (3.86) | 0.3827 | 0.3570 |
| ln ESTADUTY | -7.7099 (-6.90) | 0.83999 (6.04) | 0.5660 | 0.5505 |
| ln STMPDUTY | -11.604 (-16.48) | 1.3226 (15.11) | 0.8907 | 0.8868 |
| ln LICENCES | -4.8169 (-8.72) | 0.69339 (10.10) | 0.7847 | 0.7770 |
| Total Tax ln TOTALTAX | -3.0398 (-8.54) | 1.2034 (27.19) | 0.9635 | 0.9622 |

Notes:

^a Estimated for sample period 1965 – 72 Figures in parentheses are t- ratios

^b Estimated for sample period 1965 – 91

Source: Obben J.& Manan J.Z. (1996)

**Table1.6: Results of Regression Models Used
to Estimate Income Elasticity**

| Dependent variable | Intercept | ln GDP | D1 | D2 | D1 (ln GDP) | D2 (ln GDP) | R ² | Adj. R ² |
|---|--------------------|-------------------|---------------------|-------------------|---------------------|-------------------|----------------|---------------------|
| Indirect Tax ln INDIRTAX ^a | -3.1602 (-4.25) | 0.85381 (7.20) | -0.35253 (-1.15) | 0.69923 (4.22) | | | 0.9215 | 0.9125 |
| ln OTHINDIR | -4.5014 (-8.23) | 0.68874 (9.98) | | 0.72299 (3.08) | | | 0.8361 | 0.8249 |
| Total Tax ln TOTALTAX | -6.7583 (-3.52) | 1.7948 (5.80) | 4.9557 (2.42) | 58.775 (0.46) | -0.72258 (-2.26) | -6.387 (-0.47) | 0.9839 | 0.9805 |

Notes:^a The adjusted R² of the model with interaction terms was lower than that of the model without interaction, hence the interaction terms were omitted

Figures in parentheses are t- ratios

Source: Obben J. & Manan J.Z. (1996)

On the whole, one can easily infer that there are very few works done on taxation for NBD. The very few and rather 'scattered' works on taxation pose some degree of difficulty to enable 'interested' individuals to really appreciate tax. Thus, this research paper will try to view tax, not only in the area of tax performances and tax structure, but also the process of taxation, which includes how tax is administered, objectives (socio-economic) of taxation, who collect taxes and to propose some policy recommendations and other additional yet important analyses not previously undertaken. Utilization of more recent data will raise this research's relevancy to NBD, which is currently experiencing the ever-changing economic condition. In the end, this paper is hoped to serve as an essential feature in the future work of taxation in NBD.

1.6.2 Foreign Literature Review

There are numerous reviews on buoyancy and income elasticity of tax revenue. In 1985, Bhaduri performed several analyses, including buoyancy and income elasticity of tax revenue for India. Her estimation was based on 22 samples of GDP, consumption expenditure and tax revenue by type, starting from the year 1951-52 and ending in 1973-74. Bhaduri used similar model to estimate the buoyancy elasticity of tax revenue. The estimation results are reproduced in **Table 1.7** below,

Table 1.7:
Buoyancy Elasticity for Indian Tax Structure:
1951-52 to 1973-74

| Category of Taxes | Independent Variables | Regression Coefficient | R ² |
|-------------------------|-----------------------------|------------------------|----------------|
| Total Tax Revenue | National Income | 1.91 (0.08) | 0.98 |
| Total Central Taxes R. | National Income | 2.03 (0.11) | 0.96 |
| Total State Tax Revenue | National Income | 1.75 (0.10) | 0.96 |
| Direct Taxes | National Income | 1.43 (0.10) | 0.95 |
| Indirect Taxes | National Income | 1.92 (0.10) | 0.94 |
| Income Tax | National Income | 0.96 (0.10) | 0.88 |
| Income Tax | N. I. from non-agricultural | 0.91 (0.10) | 0.86 |
| Union & State Excise D. | National Income | 2.71 (0.21) | 0.93 |
| Union Excise | Consumption Expenditure | 3.45 (0.39) | 0.86 |
| Land Revenue | National Income | 0.86 (0.15) | 0.75 |
| Sales Tax | National Income | 2.41 (0.15) | 0.95 |
| Sales Tax | Consumption Expenditure | 2.45 (0.19) | 0.92 |
| Agricultural Income Tax | National Income | 1.14 (0.23) | 0.64 |
| Corporation Tax | National Income | 3.11 (0.22) | 0.94 |
| Customs Duty | National Income | 1.18 (0.24) | 0.62 |
| Motor Vehicle Tax | National Income | 2.35 (0.16) | 0.94 |
| Entertainment | National Income | 2.10 (0.10) | 0.97 |
| Electrical Duty | National Income | 2.97 (0.18) | 0.95 |
| Sharp and Registration | National Income | 1.38 (0.06) | 0.98 |
| Sales Tax on Motor Spt | National Income | 2.87 (0.71) | 0.56 |

Source: Bhaduri S.C. (1985)

With the exception of income tax and land revenue, all taxes have buoyancy elasticity greater than one, varying from 1.14 in the case of agricultural income tax to 3.11 for corporate taxation. The value of R² is high throughout which means that data give a good fit. It reveals that one percent increase in national income is being accompanied by roughly 1.91 percent increase in total tax revenue, and 2.03 per cent and 1.75 per cent increases in the revenues of the central governments respectively. This, as suggested by Bhaduri, may be explained by the additional tax efforts undertaken by both the governments together over the period. These additional tax efforts have turned out to be quite income elastic. Indirect taxes turn out to be more buoyant (1.92) than direct taxes (1.43). Bhaduri explained that the high buoyancy

elasticity of indirect taxes may be explained by the fact that additional tax efforts have largely taken the form of commodity taxes or taxes on transactions.

Corporation tax with an elasticity of 3.11 is the most buoyant Central tax, followed by excise and customs duty with coefficients of 2.71 and 1.18 respectively; while the sales tax with a coefficient of 2.41 shows its importance to the states. Entertainment tax (2.10), motor vehicle (2.35), electricity duty (2.97), sales tax on motor spirit (2.87), though highly buoyant, contribute very insignificant amounts to the state; while land revenue (0.86), income tax (0.91), etc., though important in the fiscal system, are not elastic in buoyancy terms.

To estimate the income elasticity of tax revenue, the method of PAM is applied and the result is reproduced in Table 1.8.

Table 1.8:
Income Elasticity for Indian Tax Structure:
1951-52 to 1973-74

| Category of Taxes | Independent Variables | Regression Coefficient | R ² |
|-------------------------|-------------------------------|------------------------|----------------|
| Total Tax Revenue | National Income | 1.21 (0.15) | 0.91 |
| Direct Taxes | National Income | 1.01 (0.11) | 0.96 |
| Indirect Taxes | National Income | 1.32 (0.20) | 0.85 |
| Income Tax | National Income | 0.43 (0.09) | 0.96 |
| Income Tax | N.I. from Non-agricultural S. | 0.90 (0.10) | 0.87 |
| Corporation Tax | National Income | 3.13 (0.24) | 0.93 |
| Land Revenue | N.I. from Agricultural sector | 0.38 (0.23) | 0.65 |
| Agricultural Income Tax | N.I. from Agricultural sector | 0.15 (0.12) | 0.12 |
| Union Excise Duties | National Income | 2.50 (0.53) | 0.80 |
| Union Excise Duties | Consumption Expenditure | 3.45 (0.39) | 0.86 |
| Customs Duty | National Income | 1.05 (0.26) | 0.55 |
| Sales Tax | National Income | 1.40 (0.33) | 0.84 |
| Sales Tax | Consumption Expenditure | 2.45 (0.19) | 0.93 |

Source: Bhaduri S.C. (1985)

Income elasticity as a measure of built-in flexibility is given in Table 1.8. The overall elasticity of the Indian tax system is 1.21. This means that a 1 percent increase

in national income brings about a 1.21 percent increase in tax revenue. This analysis reveals that total direct taxes have a flexibility coefficients equal to 1.01 as compared to 1.32 in the case of indirect taxes. According to Bhaduri, this improvement in the elasticity of direct taxes still leaves it comparatively low for the Indian economy, where there is too much concentration of economic power in too few hands. The same line of argument may be used to explain the high value of elasticity in respect of indirect taxes.

Analysis of individual direct taxes reveals that the two important central taxes, corporation and personal income tax, as variables of national income have regression coefficients of 3.13 and 0.43 respectively. Bhaduri argues that the high degree of flexibility in the case of corporation tax may be explained by its coverage and improvement in tax administration. However, at the State level, both the important direct taxes – land revenue and agricultural income tax – have a considerably lower elasticity. Among the Central indirect taxes, excise (2.50) is the most elastic tax, followed by customs duty (1.06). Sales tax is the most flexible (1.40) indirect tax at the State level. According to Bhaduri, improvements in the elasticity of excise and the general sales tax may be attributed to major changes introduced by the Central and the State governments, respectively. These changes include the enhancement of the rates as well as the extension of their tax base.

In 1983, Asher and Booth provide us the 'package' of analyses of indirect taxation in ASEAN countries. Included in the study is the estimation of buoyancy and income elasticity of indirect taxation in ASEAN. Since this study is obviously

relevant to NBD, it is included here. The estimation results for sales and excise are reproduced in Table 1.9.

Table 1.9:
The Buoyancy and Income Elasticity of
Sales and Excise Taxes in ASEAN

| Tax Category | Income Elasticity | | | | |
|-------------------|---------------------|-------------------|-------------------|------|-------------------|
| | I | M | P | S | T |
| Total Sales Taxes | 1.11 ^a | 1.04 ^c | NE | NE | 1.05 ^a |
| Total Excise | 0.80 ^b | 1.11 ^c | 0.45 ^b | NE | NE |
| Tax Category | Buoyancy Elasticity | | | | |
| | I | M | P | S | T |
| Total Sales Taxes | 1.18 | 1.07 | 1.01 | 1.11 | 1.06 |
| Total Excise | 0.67 | 1.21 | 0.99 | 0.91 | 1.26 |

Notes:

NE = not estimated.

I = Indonesia; M = Malaysia; P = Philippines; S = Singapore; T = Thailand

^a *Income elasticity is estimated by DVM*

^b *Income elasticity is estimated by CRSM*

^c *Income elasticity is estimated by PAM*

Sources: Asher M. G. & Booth A. (1983)

For Indonesia, the income elasticity of the total sales tax is estimated using the DVM and the income elasticity of total excise tax is estimated by the CRSM. The period of study starts from 1970 to 1979.

The total sales tax is moderately income elastic (1.11) and buoyant (1.18). According to Asher and Booth, despite of large reductions in the sales tax rates during 9 years period (1970 to 1979), the buoyancy value is larger than income elasticity value, suggesting improvements in the collection efficiency. In part, as suggested by Asher and Booth, this may have been due to the reduced incentives for tax evasion provided by the significant reductions in tax rates in 1971. The buoyancy of the total excises is estimated for two time periods (FY 1970 to FY 1980; and FY 1970 to FY 1976). Since this value is larger for 1970 to 1980 period (0.91 vs. 0.67 for FY 1970 to 1976), Asher and Booth argue that this may indicate more frequent upward revisions

in rates since 1976, and in the case of *ad valorem* tobacco excises, effects of inflation on the value of the tobacco products. The income elasticity of all the components of total excises is less than one; Liquor Excises (0.80), Tobacco Excises (0.76), and Sugar Excises (0.24). Thus, according to Asher and Booth, continued reliance on traditional excises is unlikely to improve the revenue productivity of the Indonesian excise tax.

For estimating the income elasticity of Malaysian sales and excise taxes the PAM is applied. The year 1979 is used as the reference year. The income elasticity of sales tax is found to be slightly above unity (1.04) and is close to the buoyancy value (1.07). According to Asher and Booth, this small difference is not surprising as there have been few changes in the sales tax structure during the period (1973 – 1979). The buoyancy of domestic sales tax (1.19), however, is found to be significantly above that of import sales tax (0.84) and this, as suggested by Asher and Booth, reflected the progress of industrialization programme and changing import composition during this period.

Total excises are found to be moderately income elastic (1.11). However, the traditional excises on alcoholic, tobacco, and petroleum products turn out to be income inelastic (0.84, 0.60, 0.90 respectively). Thus, the income elasticity of total excises is due to the high elasticity obtained for motor vehicles and other consumer durable goods (1.68). Based on this result, we can see that excises or luxury items are likely to increase revenue productivity is supported by the evidence for Malaysia.

For estimating the income elasticity of sales and excise taxes in the Philippines, unless otherwise noted, the CRSM is applied. The buoyancy of both sales and excise taxes is roughly unity (1.01 and 0.99 respectively). The buoyancy of the import tax (0.91) is again smaller than that of the domestic sales tax (1.09). Among the categories comprising the domestic sales tax, the lowest buoyancy is exhibited by sales tax on domestic goods (0.95). The two possible explanations as suggested by Asher & Booth can be the low priority accorded to the administration and collection of sales tax on goods during most of the period under consideration; and in overgenerous fiscal incentives provided for industrialization.

In estimating the income elasticity of the various components of the sales tax, the DVM is used. The major change in both the tax structure and tax administration occurred shortly after the martial law was imposed in 1972. The dummy variable technique is also used for estimating the income elasticity of tobacco excises. Here, two changes in the tax structure were taken into account. The first was the change in the tax rates occurring in 1972, and the other was the rate change in 1975. The dummy variable used for the 1972 change would also incorporate any changes in collection efficiency due to the declaration of martial law that year. The income elasticity of the predominant components of the total sales tax is below unity, the total sales tax may also be construed as being income inelastic. The traditional excises are also income elastic. This, as suggested by Asher and Booth, in conjunction with low buoyancy values, indicates that unless changes in the structure of sales and excise taxes occur and, to a lesser extent, unless the collection efficiency is significantly improved,

these two taxes are unlikely to contribute to raising the tax to Gross National Product (GNP) ratio.

In the case of Singapore, the CRSM is used to adjust the historical for the changes in the tax structure. It is found that, while the buoyancy of sales tax is above unity, the excise tax is found to be below unity. Among the excises, only the motor vehicles category has a buoyancy value above unity. Thus, the traditional excises are not only found to be income inelastic but also have a buoyancy value of less than unity.

For estimating the income elasticity of the sales tax, the DVM is applied. For excises, the constant rate structure method is applied for tobacco and alcoholic products (some problems were faced in this case). The main point to be noted from the estimates in this table is the significantly higher absolute buoyancy of excise taxes (1.26) as compared to that of the sales tax (1.06). This, according to Asher and Booth, may be partly attributed to a greater administration efficiency of excise taxes, and the high buoyancy for excises seems to be the result of substantial increases in the tax rates, especially in the 1970s.

1.7 Limitation of the Study

A major limitation of the study – as it always has been – is the problem of obtaining the reliable and most recent data. Some data, especially those that are based on estimations, have different figures in different years, forcing the researcher to

make decision which data to be used based on his judgment. A 'casual' decision may alter the results if say the figure 'differentiations' are significant, thereby, posing a certain degree of invalidation to a particular analysis. In addition, some data are inaccessible, confidential and scattered in various government departments, making data collection more time consuming. Moreover, some data are not formatted in such a way suitable for the research. This is particularly true in the case of data for the country group's tax reliance ratios (and others), where the researcher had to performed manual – and of course very demanding – calculation to get the percentages as these are not furnished in the recent series of the Government Finance Statistics Yearbooks. Even worse, some data are not even computed and this poses some level of disappointment for the researcher and hence some analyses cannot be performed adequately.

1.8 Organization of the Study

This study is structured as follows. **Chapter 1** is the introduction. **Chapter 2** will present the theoretical background, which includes the theory of tax, e.g., elasticity and buoyancy elasticity of tax and others. **Chapter 3** will examine the economy of NBD. In **Chapter 4**, we will look at the tax structure in NBD. Some important tax analyses are performed in **Chapter 5** and these include, tax burden, tax-reliance ratio and tax-effort ratio, and direct-indirect tax ratio and also buoyancy and income elasticity of tax revenue. **Chapter 6** will present policy recommendations and the conclusions of the research paper.

CHAPTER 2