OPTIONS FOR FURTHER TAX REFORM

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Abstract:

Economists have long suggested that the burden of taxation should fall on consumption in order to stimulate savings. In Barbados, however, relatively high marginal taxes on income and profits have been the norm for most of the nation's history. This study considers a number of options for reforming the present tax structure in Barbados. The alternatives outlined range from minor tinkering with current rates to an entire new system. Based on both social and economic cost-benefit analysis, the study finds that a reduction in taxes on income and profits and a slight increase in the rate of VAT or the introduction of a flat tax can lead to significant economic gains without affecting the sustainability of government's accounts.

Keywords: Tax Reform; VAT; Flat Tax
JEL Codes*:* H2; P41; E17

1. Introduction

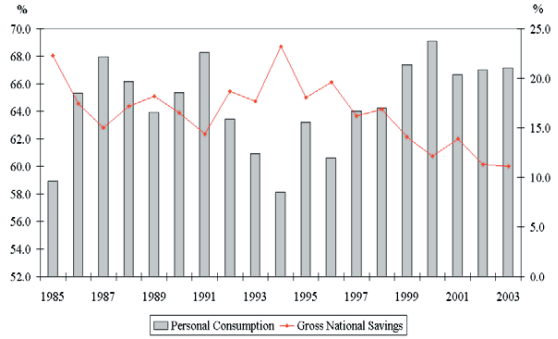
The concept of optimal taxation has been the subject of a large body of economic research. One of the earliest of these was Smith (1776) who recommends that taxes should have the characteristics of equality, certainty, convenience of payment and economy in collection. Later theoretical literature, for example Ramsey (1927) and Mirrlees (1971), utilise the concept of a social welfare function, usually defined as the weighted sum of individual utilities, to obtain optimal tax rules. Thus, the optimal tax rate or system causes the least distortions to economic decisions and equality while raising the desired level of revenue (see Auerbach, 1985, and; Heady, 1993 for surveys of this literature).

The idea of an optimal tax is behind most of the recommendations for reform, as an optimal system is one in which it is impossible to design changes that would increase social welfare. In practice, it is quite difficult to design the *best* tax system, as the economy and economic decision-making process is dynamic; the goals of most reform plans are therefore to obtain a *better* tax system. And, as Heady (1993) notes, a country that sequentially implements tax reform programmes, which improve social welfare, will eventually approach optimality.

Added to the difficulty of designing systems to achieve sometimes competing goals, for example equality and economy in collection, governments are also faced with the problem of whether or not to tax income or consumption. Income taxation places a levy on all income earned. Therefore, if an individual receives labour income and saves a proportion, the interest on those savings is also subject to tax. With consumption as the base, only when savings are spent are they subject to tax. It is likely that using income as the base could skew economic agents' preference away from savings to consumption.

Figure 1 provides data on the trends in consumption and savings in Barbados over the period 1985-2003. The chart shows that savings, as a proportion of gross national income, has declined by 5.7 percentage points to 12.3 percent over the 1985-2003 period. Low rates of savings can constrain investment, and lower employment and economic growth. In a small open economy with a fixed exchange rate, high rates of consumption can also lead to balance of payments difficulties, as the demand for foreign exchange outstrips supply.

Figure 1: Trends in Consumption and Saving



Source: Calculated from National Accounts and Balance of Payments Statistics published by the Barbados Statistical Service and the Central Bank of Barbados, respectively.

This paper attempts to provide options for further tax reform, which would explicitly attempt to shift most of the burden of taxation to consumption. Two options are assessed: a flat tax, and further changes to the rates of tax on income and profits and the current value-added tax (VAT) system. The first proposal is more radical in scope and puts forward a new approach to revenue collection. The Hall and Rabushka (1995) plan places a flat rate of tax on both individual and corporate consumption (calculated as income less approved savings), while the second option envisages a dramatic reduction in the rate of taxes on personal and corporate income, which could be offset by a rise in the VAT rate, but not above that in most countries.

The potential economic impact of the proposals is evaluated via a fiscal model of the Barbadian economy, which explicitly specifies labour demand, consumption and investment as functions of the rates of taxation, and therefore provides estimates of the influence of the tax changes on national income, the fiscal and external balances and key monetary variables. Welfare impacts of the tax reform proposals on various income groups and implementation issues are also provided.

The structure of the paper is as follows. Following the Introduction, Section 2 gives a brief survey of major tax developments between 1946-2003 (for further analysis on can see

Howard, 2001, and Williams, 2001). Section 3 provides the proposed tax reforms and Section 4 discusses the distributional impact and implementation issues. Section 5 concludes.

2. Trends in Fiscal Policy

2.1 Funding the Development of a Nation (1946-1969)

The *Abstract of Statistics* (1956) reports that nominal Gross Domestic Product (GDP) per capita in 1946 was approximately $205, rising to $928 in 1969 (see Table 1). Most of this output was generated by the sugar industry. In 1946, for example, approximately 38 percent of GDP was due to sugar, while just under 30 percent of the employed labour force was engaged in some activity related to industry.

The two main sources of revenues during this period were taxes on income and profits and customs and excise duties, which together accounted for 77 percent of total receipts during the 1946-1969 period. In line with economic thinking at the time, a large number of income tax bands were used in an attempt to foster a more equitable distribution of income. In 1949 the top income tax bracket, over $24,000 (approximately $456,000 in 2001 dollars), was taxed at a rate of 75 percent. For those earning between 0 and $450 the rate was 2.5 percent, between $101 and $1000 on average 16 percent, between $1001 and $2500 on average 41.5 percent and between $2501 and $5000 approximately 60 percent (see Beasley, 1952). Given these astronomical rates, there was tremendous difficulty in administering the system during the period. Bonnet (1956) estimates that for the period 1951-1953, the ratio of total taxable income to aggregate factor income payments averaged just 24 percent.

Government's fiscal accounts were usually in surplus from 1946-1954, as the eleven parish authorities removed some of the expenditure burden from the central government. However, a slowdown in economic activity from 1954-1956, a rapid increase in capital expenditure to build up the nation's infrastructure and the demise of the parish authorities in 1956, implied that expenditure needs were growing much faster than revenue collected. For the remainder of the review period, 1955-1969, the average fiscal deficit was -3.9 percent of GDP, reaching as high as -8.7 percent in 1959.

The external balance of Barbados during this period was also relatively large, as the economy was structured mainly for the production and export of sugar cane; little else in the way of export goods were produced. Commercial banking in Barbados at this time was still in its infancy. Both credit and deposit ratios to GDP were low by present standards, just 34 and 47 percent, respectively.

Table 1: Trends in Key Macroeconomic Indicators

	1946-1969	1970-1989	1990-1999	2000-2003
Population	229,886	252,030	264,100	270,438
GDP per Capita	454.5	5,586.9	12,297.7	15,639.3
Growth in GDP per capita	7.0	13.7	3.3	0.9
GDP (millions)	107.7	1,414.3	3,250.7	4,229.5
Sugar	24.8	54.9	55.7	44.2
Other Agriculture & Fisheries	9.2	53.8	119.8	123.7
Industry	14.2	158.6	243.1	300.1
Tourism	n.a.	181.6	399.5	478.9
Services	59.5	1,001.7	2,436.9	3282.7
Retail Prices (2001=100)	7.5	41.5	85.8	99.3
Inflation	3.8	10.4	2.9	1.2
Fiscal Deficit (% of GDP)	-0.1	-5.5	-2.5	-4.6
Fiscal Deficit	-1.7	-78.8	-77.5	-195.5
Total Revenue	25.8	416.4	1,202.2	1,748.7
Total Expenditure	27.6	495.2	1,279.7	1,944.2
Current Expenditure	22.7	388.9	1,095.2	1,625.6
Captal Expenditure	9.0	106.4	184.5	318.6
Current Account (% of GDP)	-11.1	-4.0	1.6	-7.6
Current Account	-15.5	-6.1	34.4	-321.1
Goods	-36.6	-102.5	-929.9	-1,463.1
Imports	80.3	598.8	1,401.8	1,996.5
Exports	43.7	188.6	471.9	533.4
Services	17.9	402.8	975.9	1,150.2
of which Travel	40.2	460.8	1,185.4	1,386.6
Income	0.0	-32.4	-94.2	-186.9
Current Transfers	3.1	15.2	82.6	178.7
Loans and Advances	36.2	569.4	1,645.0	2,805.6
Deposits	51.1	734.8	2,616.2	4,780.2
Demand	18.9	164.8	717.1	1,671.3
Time	12.9	222.9	593.0	964.6
Savings	19.4	347.0	1,306.1	2,144.3

2.2 Supply-Side Economics and Tax Policies (1970-1989)

A full four years after independence the newly formed state was facing a number of internal and external challenges. The sugar industry, which in the previous era provided up to a third of total value-added rapidly declined, principally due to technological obsolescence at most factories and competition from other areas of the economy for scarce land resources. As a result, the contribution of sugar fell to less than 5 percent of value-added during the 1970-1989 period.

On account of the decline of sugar, alternative areas of economic activity had to be promoted. Through a system of protective tariffs and tax rebates, policy-makers in Barbados promoted the development of a small-scale manufacturing industry. At the same time, greater funding for the marketing of Barbados as a tourism destination was also provided. As a result, between 1970-1989 real value-added in these two industries experienced double-digit rates of growth. By the end of the period under review the contribution of manufacturing had risen from less than 3 percent, to over 10 percent by 1989. Similarly, tourism's share of value-added more than doubled, from 6 percent in 1970 to just over 13 percent by 1989.

With the relatively high wage tourism and manufacturing performing well, taxes on income and profits doubled. The high import content of tourism and manufacturing also resulted in rising import duties and taxes on goods and services. Nevertheless, the fiscal deficit expanded appreciably as capital expenditure continued to rise at around 18 percent per year.

The economy also had to come to grips with two oil price shocks. First in 1973, the average price of UK Brent crude jumped from just $8 per barrel to almost $26 per barrel, and secondly in the latter half of the 1970s when the average price of oil rose from $26 per barrel to $60 per barrel in 1979, reaching as high as $80 per barrel in 1980. As would be expected, inflation in Barbados attained unprecedented levels. In 1974 the average rate of retail price inflation was approximately 40 percent, followed by another 20 percent expansion in the ensuing year.

In an attempt to buffer the effects of inflation on economic growth and development, the government of the day introduced a number of minor tax changes, especially in the 1979-1985 period. These included increased allowances for both single and married persons, the ability to claim savings with credit unions for tax purposes, income tax deductions for new shares in public companies and income tax allowances for repairs to dwelling units. Additionally, to counter problems of tight external liquidity, approximately $97.1 million was borrowed from the International Monetary Fund under a standby programme. The main conditionalities of this loan included reducing the fiscal balance from above 6.6% of GDP in fiscal year 1981-1982 to 2.3% in

fiscal year 1983-1984, limits on borrowing from the Central Bank of Barbados and the local banking system.

As inflation subdued in the mid-1980s, government then turned its attention to economic growth. A major tax reform programme was implemented in 1986 which eliminated income taxes for all persons earning less than $15,000 per year, the reduction in the maximum corporate tax rate from 45 percent to 35 percent and the exclusion of pensions from the income tax net and a reduction in the maximum personal tax rate from 60 percent from 50 percent.

These measures stimulated both savings and investment in the domestic economy, and actually improved government's revenue collections. Over the period 1987 to 1989 taxes on income and profits rose by 20.2 percent. However, the additional revenue was used to finance additional capital and current expenditure. Capital expenditure rose by a whopping 20 percent in 1987 and a further 13.5 percent in the following year. Similarly, current expenditure grew by 10.9 percent per year during the period, principally due to higher wages and salaries and greater transfers to public institutions. Consequently, government's fiscal deficit went from just –2.3 percent of GDP in 1989 to –8.4 percent in the following year. Barbados' external position deteriorated appreciably. The Net International Reserves (NIR) of the monetary authorities fell from $214 million in 1986 to just $39 million in 1991.

2.3 Structural Adjustment (1990-1999)

The shortage of foreign exchange to purchase imported imputs for local production, along with the effects of the first Persian Gulf conflict and the decline in manufacturing activity resulted in a sudden halt to economic growth. Growth, which in the previous five years (1985-1989) had averaged 3.2 percent per year, contracted by 3.3 percent in 1990, a further 3.9 percent in 1991 and 7.2 percent in 1992. As a result, the government of the day introduced another tax reform programme, based principally on IMF recommendations to improve government's finances and stimulate economic growth. The reform package established a single basic rate of 25 percent on taxable income below $24,200, and a marginal rate of 40 percent for all amounts above. Additionally, most allowances were eliminated, pensions were again subject to income taxes, the corporate tax rate was raised from 35 to 40 percent, a property tax was introduced and the threshold below which income tax is not paid was lowered from $15,000 to $13,000. To further simplify the system, a VAT was initiated in 1996, (effective 1st January 1997) at a rate of 15 percent for most goods and services and 7.5 percent for accommodation establishments. This single tax eliminated a number of other indirect taxes, mainly consumption and stamp duties, and successfully broadened the tax base and increased government revenue (see Alleyne and Howard, 2003).

Table 2: Tax Revenues by Category*

	1946-1969	1970-1989	1990-1999	2000-2002	*2003P*
Millions					
Tax Revenue	20.9	382.0	1122.6	1614.0	1754.5
Taxes on Income and Profit	9.0	133.7	365.6	600.8	551.2
Levies	0.0	19.7	40.9	16.9	4.5
Taxes on Property	0.6	21.9	66.0	97.3	103.5
Taxes on Goods and Services	4.6	108.1	483.4	738.2	893.5
Import Duties	8.2	69.2	102.3	147.3	187.8
Other	0.4	29.3	64.4	13.5	14.0
Percent of Total					
Tax Revenue	100.0	100.0	100.0	100.0	100.0
Taxes on Income and Profit	37.7	39.9	32.4	37.2	31.4
Levies	0.0	3.0	4.2	1.0	0.3
Taxes on Property	2.9	6.0	5.9	6.0	5.9
Taxes on Goods and Services	18.3	25.4	41.8	45.7	50.9
Import Duties	38.3	20.7	9.2	9.1	10.7
Other	2.8	5.1	6.5	0.8	0.8

Overall, the tax reform package resulted in a significant improvement in government finances: between 1993 and 1999 government's fiscal deficit averaged just -1.6 percent of GDP. Accordingly, the nation's external current account was almost in balance throughout most of the period and eight consecutive years (1993-2000) of economic growth was recorded. On the revenue side, taxes on goods and services took over from income and profit as the predominant source of government revenues, accounting for 42 percent of the total tax take. On the other hand, as regional and multilateral attempts at liberalisation were put in place, import duties fell to below 10 percent of total revenues (see Table 2).

2.4 External Pressures on Domestic Tax Rates (2000-Present)

Whilst most of the tax changes reviewed so far emanated from domestic considerations, taxation in the 21st century has come under increased pressure from outside of the country. Barbados and

other so-called offshore financial centres (OFCs) have come under the microscope of the Financial Action Task Force (FATF) and the Organisation for Economic Cooperation and Development (OECD), as avenues for money-laundering and tax evasion. Accordingly, many OFCs are investigating means to converge the rates of taxes paid by offshore and onshore companies. As a signatory to the revised treaty of Chagaramas, Barbados has also committed itself to forming an economic and monetary union with 14 other Caribbean territories. Government has therefore had to think about possible tax competition within the union as some territories currently have lower corporate rates than in Barbados.

The combined effects of these two forces resulted in the minister of finance in 2002 outlining a number of changes. As it relates to corporate taxes, this rate was lowered to 37.5 percent in the first year, with the expressed goal of bringing the rate down to about 25 percent by 2006. In terms of personal taxes, the basic tax rate is planned to be reduced from 25 percent to 20 percent by 2004, while the marginal tax rate from 40 percent to 35 percent by 2006. Additionally, the threshold below which tax is not paid and house allowances are to be increased in the medium term. Taxes on imported goods are also likely to be revised, as Barbados has committed itself to reducing its "bound" rates of duty on imported agricultural and manufactured goods as outlined in the General Agreement on Trade and Tariffs (1994) accord (see Bynoe-Lewis, Griffith and Moore, 2002).

With governments tax revenues expected to decline over the medium-term, policymakers need to do one of two things: either reduce the amount of services provided or examine new innovative means of taxation, for example taxing consumption rather than income or profits. The following section provides possible alternatives.

3. Options for Tax Reform

The two alternatives for tax reform considered in this study share the common objective of shifting the burden of tax collection from income. The first alternative is the Hall and Rabushka (1995) flat expenditure tax proposal. Although similar in collection to existing income taxes, it can best be viewed as a variant on the current VAT system. The second option considered is a reduction in the personal and corporate tax rates, but an increase in the current rate of VAT. The new proposals main goal is to raise the same amount of revenue currently obtained without increasing the tax burden; the issue of optimal government size is not considered (see Alleyne, Lewis-Bynoe and Moore, 2004 for an examination of this issue).

3.1. A Flat Expenditure Tax (FET)

A FET is a tax applied on the difference between income and savings or, more specifically, consumption. There are two main variants of the FET: the simple FET and the comprehensive FET (see Mintz, 1996). With the simple FET, the individual income base is defined as all earnings from work effort (i.e. wages, salaries and benefits). For businesses, the tax base is corporate cash flows: revenues from the sale of goods and services less expenditure on labour, materials and capital expenditure (net of disposals). With the comprehensive FET, on the other hand, the individual income base is identified as all earnings from work effort, inheritances, gifts and registered borrowings net of repayments received by the taxpayer, less savings contributed to registered assets, such as share purchases and bonds, with interest earned only taxed when they are withdrawn. For businesses, the comprehensive FET defines the income base as revenues from the sale of goods and services, financial income, repayment of loans and borrowings less expenditure on labour, materials, capital expenditure (net of disposals), interest and principal on debt repayments and the purchase of financial assets. All income is taxed at the same rate, as this makes it difficult for individuals to take advantage of the differential between the individual and corporate tax rates. However, to provide for some degree of progressivity in the tax reform proposal, generous personal allowances can be utilised.

The principal difference between the simple and comprehensive FET systems is the treatment of financial intermediation[1]. While the simple FET only considers real transactions, the comprehensive FET taxes both real and financial activities. As such, income from financial intermediation, measured as total property income received less interest payable (excluding the value of income received from the investment of the intermediary's own funds), is included in the base.

In addition to the simple and comprehensive FET tax options, the FET can be either origin- or destination-based. An origin-based system imposes taxes only on income earned in the domestic economy, while a destination-based tax structure imposes taxes on all income earned by resident individuals or institutions, whether created in Barbados or abroad. Due to the

[1] Financial intermediation occurs when an institutional unit incurs financial liabilities in order to acquire financial assets.

administrative burden of collecting taxes under the destination-based tax structure, the origin-based scheme seems more economically feasible.

The main advantage of the FET is that it does not bias the economy towards too little saving (investment) and too much consumption. This is especially important given the current shift away from public to privately funded pension plans, as the amount employers contribute to a plan is not taxed. For policymakers, it provides an innovative means of addressing current external pressures to converge the difference in rates between on-shore and off-shore corporate entities, since all businesses will be taxed at the same flat rate. Additionally, given that taxes are imposed only on cash flow, it reduces the distortionary effect that corporate taxes can have on firm survival and growth.

To obtain the revenue neutral tax rate, the lower bound on the FET (τ^{FET}) can be estimated as:

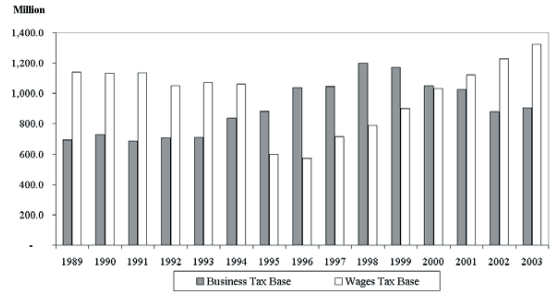
$$\tau^{FET} = \frac{Required\ Tax\ Revenue}{Individual\ Income + Business\ Income} \quad (1)$$

To calculate the income base, the computation begins with the broadest measure of national income: GDP at market prices. From this value, indirect business taxes, income included in GDP but not in the tax base[2], wages and investment are excluded to generate an estimate of the business tax base. The estimates of GDP, indirect business taxes and investment are obtained from the National Accounts Statistics published by the Barbados Statistical Service (BSS). Total national wage income are taken from the 1995 *Continuous Labour Force Sample Survey Report* published by the BSS and updated with the wage index series of Moore and Maynard (2004), while income included in GDP but not in the tax base is estimated at 3.4 percent of GDP; this is inline with estimates for the US used by Hall and Rabushka (1995). To obtain the individual tax base, the wage income series is adjusted for an average household allowance of $25,000 times the total number of households submitting returns, estimated at 60,000 (based on the average number returns submitted to the Inland Revenue Service in 1999).

Figure 2 displays the individual and business tax base for the period 1989 to 2003. The figure shows that between 1993 and 2000 the business income base expanded on average by approximately 11 percent per year. However, as a result of the global slowdown between 2001 and 2002 and the after effects of 9/11 on Barbados' tourism product and auxiliary industries, the business tax base has stagnated at the 2000 level. For individuals, on the other hand, the income tax base was constant between 1989 and 1994. However, with the simplification of the tax system in 1994 precipitating an increase in the number of persons filing tax returns, the family allowance reduced the individual tax base appreciably in 1995. Since this one-off fall, the individual income tax base has grown on average by 5 percent per annum or roughly in line with the rate of growth of GDP (the rate of nominal GDP growth during this period was 4.9 percent per year).

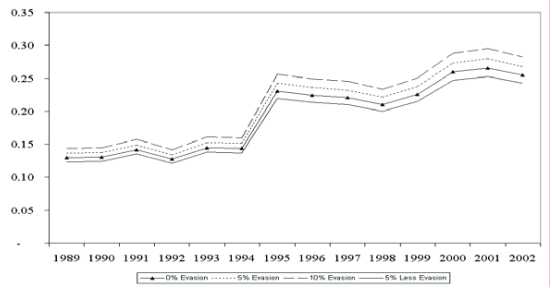
[2] This includes such items as the value of houses owned and occupied by families.

Figure 2: Flat Tax Base



Source: Author's Calculations

Figure 3: Revenue-Neutral Flat Tax Rate



Source: Author's Calculations

Using Equation (1), an estimate of the lower bound to the FET for the period 1989 to 2003 is provided in Figure 3. For 2003, the revenue-neutral FET rate is estimated at 24 percent, which is roughly inline with the Hall and Rabushka (1995) 19 percent flat tax proposal for the USA, and below the present rates of taxes on income and profits in Barbados. As with most tax systems, it is likely that there could be some measure of avoidance, and to a lesser extent evasion, on the part of both individuals and businesses. To allow for these two phenomena, the tax bases for both individuals and business are reduced by 5 and 10 percent to show how the revenue neutral rate would change given the level of avoidance. The figure also allows for an increase in the number of persons filling as a result of the new system. The results shows that the tax rate ranges from 25 percent, assuming minimal evasion, to as high as 26 percent, in the case of chronic tax avoidance.

3.2 VAT and Income Tax Reform

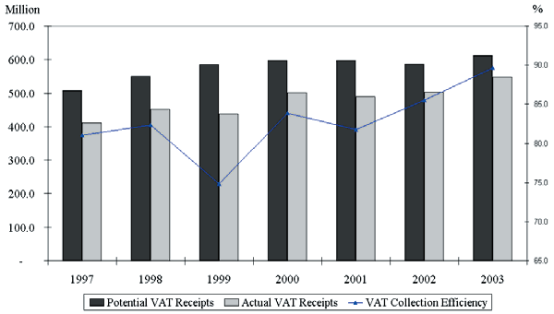
The second proposal requires no changes to the present tax system, only to the rates of tax on income and profits and the VAT. To examine the fiscal implications of the changes the study utilises the tax simulation model outlined in Appendix 1. For the VAT, an estimate of potential VAT receipts (R^p) is calculated as:

$$R^p = \tau^t \times tourism\ value-added + \tau^{nt} \times non-tourism\ value-added \quad (3)$$

where τ^t is the rate of VAT on accommodation services and τ^{nt} is the rate of VAT on non-tourism activities. Combining R^p with data on actual VAT receipts provides a measure of what is referred to as collection efficiency.

Figure 4 plots the estimates of potential and actual VAT collections and an estimate of collection efficiency for the period 1997 to 2003. The figure shows that for most of the period under consideration, actual receipts have usually represented approximately 82 percent of potential revenue, with the exception of 1999. The sharp fall-off in actual receipts in 1999 was principally due to higher payments of refunds and increased delinquency on the part of some businesses.

Figure 4: Estimates of Actual and Potential VAT Receipts



Source: Annual Statistical Digest of the Central Bank of Barbados and Author's Calculations

The options considered are: (1) a 25 percent tax on income and profits and no changes in the VAT rate; (2) a 25 percent tax on income and profits and a 17 percent VAT rate; (3) a 20 percent tax on income and profits and a 17 percent VAT rate; (4) a 15 percent tax on income and profits and a 19 percent VAT rate, and; (5) a 12.5 percent tax on income and profits and a 20 percent VAT rate. In all the simulations, the VAT collection efficiency ratio is held unchanged.

The baseline tax revenues given in Table 3 are the cumulative tax receipts that are likely to be collected over the six-year period 2004-2010. For each option, an estimate of the potential loss/gain in revenue is presented. Although there does not exists a plan to converge the marginal personal income and the corporate tax rates in the medium-term, in the long-run one would expect the two rates to converge as some individuals attempt to shift their tax burden into businesses to benefit from the lower rate. Thus, option 1 examines how realistic is such a convergence. The table shows that to implement this change, it would cost the government approximately $492.6 million in loss revenue over a seven-year period, mainly due to a steep decline in personal tax revenues, as the rate falls from 35 percent to 25 percent. To compensate for this loss in revenue, it is likely that government will have to boost the VAT rate. Option 2 shows that if the VAT rate is raised by 2 percentage points, then the central government would gain approximately $126.1 million between 2004-2010.

Table 3: Cumulative Costs to Government of Changes in Tax Rates (2004-2010)

	Baseline Tax Revenues	Option 1: 25% Tax on Income and Profits	Option 2: 25% Tax on Income and Profits and a 17% VAT	Option 3: 20% Tax on Income and Profits and a 17% VAT	Option 4: 15% Tax on Income and Profits, a 19% VAT	Option 5: 12.5% Tax on Income and Profits, a 20% VAT
$ Mil						
Total Tax Revenues	14758.5	-514.3	126.5	-157.9	-201.8	-228.4
Personal Tax Revenues	2811.9	-648.6	-648.6	-906.7	-1580.0	-1930.5
Corporate Tax Revenues	1445.8	-108.2	-108.2	-457.0	-826.6	-1019.1
VAT Revenues	5088.3	109.1	749.9	906.8	1739.8	2171.3
% of GDP						
Total Tax Revenues	30.4	-1.8	-0.8	-2.2	-3.3	-3.9
Personal Tax Revenues	5.8	-1.5	-1.5	-2.1	-3.5	-4.2
Corporate Tax Revenues	3.0	-0.3	-0.4	-1.1	-1.9	-2.3
VAT Revenues	10.5	0.0	1.1	1.1	2.3	2.8

The other three options take the exercise even further and examine what changes in the VAT would have to accompany even lower rates of tax on income and profits. Table 3 shows that a rate of tax on income and profits of 12.5 percent and a VAT rate of 20 percent would cost the government approximately $204.0 million over a seven-year period. This outcome is not as steep as one would expect as the lower tax rates facilitate greater investment and savings and thereby higher rates of economic growth. Option 5 seems very advantageous, as it would result in a rate of tax on income and profits on domestic economic units, which is not significantly different from the present rate of tax on international business and financial service entities. Additionally, the required rate of VAT to accomplish this goal would not be significantly higher than in other countries; Table 4 shows that VAT rates presently range from as low as 7 percent in Canada to as high as 25 percent in Sweden.

Table 4: International Comparison of Rates of VAT

Country	VAT Rate (%)
Argentina	21.0
Austria	20.0
Barbados	15.0
Belgium	21.0
Canada	7.0
Chile	18.0
Finland	22.0
France	19.6
Germany	16.0
Greece	18.0
Ireland	20.0
Italy	20.0
Jamaica	15.0
Luxembourg	15.0
Mexico	15.0
Netherlands	17.5
Sweden	25.0
Trinidad and Tobago	15.0
United Kingdom	17.5
Uruguay	23.0

Sources: IMF Statistics, Pricewaterhouse Coopers Worldwide Summary of Corporate Taxes 1999-2000 and Ernst and Young Worldwide Corporate Tax Guide 2003

4. Social and Economic Consequences

4.1 Macroeconomic Impact

To evaluate the macroeconomic impact of the various tax changes a small-scale macroeconomic model, outlined in the appendix, is employed. The model consists of four blocks, demand and output, fiscal, external and monetary. Each block utilises a combination of econometric equations and ratios to forecast the future time path of a particular variable. The simulations show the gain/loss in the variable of interest compared to the baseline scenario and the results are presented in Table 5.

The '12.5-20' proposal has the greatest positive impact on overall economic growth, as it raises GDP growth by a cumulative 17.8 percent, compared to 5.4 percent for the flat tax proposal. Most of this growth results from greater investment and consumption expenditure. Lower corporate taxes not only influence the amount of investment undertaken, but can also affect the type of investment. High rates of corporate taxation tend to encourage firms to invest in assets which have shorter depreciation periods, as these can be written-off for tax purposes. Therefore, it is also likely that more investment in assets with longer life spans could accompany the reduction in tax rates. To facilitate the higher rate of growth under the '12.5-20' proposal, a cumulative increase in private sector credit from the baseline scenario of 13.5 percentage points would be required, compared to just 7.9 percentage points in the case of the flat tax. Domestic deposits is still likely to grow faster than credit, however, as individuals take the opportunity to save some of the gains from the new tax systems.

Although the tax proposals are designed to be revenue neutral a reduction in income taxes is likely to have second round effects on growth, therefore some change in government's fiscal position from the baseline scenario is observed. The flat tax seems to be the most advantageous from a fiscal point of view, as it leads to a reduction in government's fiscal balance of 14.1 percent over 7 years. This gain in revenue is primarily on account of rising personal and corporate tax bases. The '12.5-20' proposal, on the other hand, worsens the government's cumulative fiscal deficit by 12.7 percent, as tax receipts from income and profits decline. Wages and salaries is also higher in this scenario as the rise in the VAT rate results in higher wage demands on the part of public sector employees.

The impact of the tax changes on the external current account differs between each scenario, as the positive influence of investment on future current account balances is partially offset by rising import demand. The flat tax results in a 0.2 percentage point worsening in the current account balance, while the '12.5-20' proposal actually leads to an improvement, as increased investment leads to greater service exports.

Table 5: Macroeconomic Simulation Results

	Baseline	Flat Tax	VAT and Income Tax Reform				
			Option 1	Option 2	Option 3	Option 4	Option 5
Annual Percentage Changes							
Final Demand							
Nominal GDP (Market Prices)	41.5	5.4	2.6	3.9	8.6	14.7	17.8
Consumption Expenditure	36.5	5.2	3.7	5.1	7.8	11.9	13.9
Gross Capital Formation	44.1	8.9	2.1	2.1	13.6	25.0	30.6
Exports of Goods and Services	42.7	5.2	1.1	1.1	7.9	14.8	18.3
Imports of Goods and Services	37.6	5.7	2.7	2.7	7.8	12.9	15.5
Money							
Private Sector Credit	42.8	7.9	2.4	2.4	6.8	11.3	13.5
Domestic Deposits	48.9	6.5	3.1	3.1	8.8	14.6	17.4
Percent of GDP at Market Prices							
Fiscal							
Fiscal Balance (CBB Basis)	-22.1	14.1	-3.6	3.8	-7.3	-10.9	-12.7
Tax Revenue	212.9	8.6	-7.0	-0.5	-15.3	-23.3	-27.3
Personal Tax Receipts	40.5	2.2	-4.8	-5.3	-14.9	-24.7	-29.5
Corporate Tax Receipts	21.1	6.2	-2.3	-2.6	-7.8	-13.2	-15.8
Value Added Tax Receipts	73.3	0.0	0.0	8.0	8.0	15.8	19.6
Total Expenditure	247.1	-5.9	-3.6	-4.7	-8.6	-13.4	-15.7
Wages and Salaries	78.0	-2.7	-1.7	-1.2	-3.0	-4.3	-5.0
External							
Current Account Balance	-43.7	-0.2	-1.1	-0.6	0.8	2.7	3.7
Goods Balance	-204.7	-3.0	-1.8	0.6	-1.3	-0.8	-0.5
Services Balance	157.9	3.8	1.4	-0.5	3.5	5.5	6.5
Capital and Financial Account	34.7	0.9	-0.7	-1.1	1.5	3.6	4.6
Reserve Movements	-9.0	0.7	-1.9	-1.7	2.3	6.3	8.3

4.2 Distributional Impact

Following Mascoll (1991), an evaluation of the proposed tax changes for three representative individuals (low, middle and high income) are provided. The average income for a low-income taxpayer is proxied by a top of the scale senior customs guard in the public sector. This salary of $25,502 seems fairly accurate given that the threshold used by government after which income taxes are applicable is $17,500 (see Table 6). The middle-income salary is represented by a deputy head teacher at a secondary school earning $63,087 per year, while that for a high-income worker is calculated as 5 times that of the low-income person or approximately $127,511. In 2002/2003 a permanent secretary in the civil service was earning $91,669 per year, therefore this salary would be representative of a senior executive in the private sector.

To arrive at realistic estimates of taxable income, some assumptions were made regarding the level of allowances. The low-income individual is assumed to have three children, two of which are at primary/secondary school and one in a tertiary level educational institution. The middle-income and high-income groups have two children each. These distribution patters are in line with those from the 2000 Population and Housing Census, which show that the average household size was 3.24 persons. It was further assumed that the low-income individual claims, $1,500 for savings in a credit union and $1,000 in pension plan contributions. In contrast, middle- and high-income persons claim the maximum allowance for savings in credit unions and also make claims for new shares in public companies/mutual funds, contributions to registered retirement savings plans, pensions and home improvement (see Appendix 2).

Table 6 shows that under the present tax system, the low income individual's effective tax rate is approximately 2 percent, while those for the middle- and high-income individuals are 15 and 23 percent respectively. The table calculated the effective tax rates after the proposed changes. For low-income individuals there is no real change in the effective rates. For the middle- and high-income individuals, however, effective rates fall appreciable. For high-income individuals the flat tax results in a 6 percentage point fall in the effective rate, while for the '12.5-20' proposal the decline is 13 percentage points.

Table 6: Distributional Impact of Tax Changes – Effective Tax Rates

	Current System	Flat Tax	VAT and Income Tax Reform				
			Option 1	Option 2	Option 3	Option 4	Option 5
Low Income Individual							
1. Gross Annual Income	25,502	25,502	25,502	25,502	25,502	25,502	25,502
2. Less Allowances	23,000	23,000	23,000	23,000	23,000	23,000	23,000
3. Taxable Income	2,502	2,502	2,502	2,502	2,502	2,502	2,502
4. Income Taxes Paid	500	550	626	626	500	375	313
5. Effective Tax Rate	2%	2%	2%	2%	2%	1%	1%
6. Real after-tax Income	25,002	24,952	24,877	24,877	25,002	25,127	25,189
Middle Income Individual							
1. Gross Annual Income	63,087	63,087	63,087	63,087	63,087	63,087	63,087
2. Less Allowances	27,500	23,500	23,500	23,500	23,500	23,500	23,500
3. Taxable Income	35,587	39,587	39,587	39,587	39,587	39,587	39,587
4. Income Taxes Paid	9,395	8,709	9,897	9,897	7,917	5,938	4,948
5. Effective Tax Rate	15%	14%	16%	16%	13%	9%	8%
6. Real after-tax Income	53,692	54,377	53,190	53,190	55,169	57,149	58,138
High Income Individual							
1. Gross Annual Income	127,511	127,511	127,511	127,511	127,511	127,511	127,511
2. Less Allowances	40,500	27,500	27,500	27,500	27,500	27,500	27,500
3. Taxable Income	87,011	100,011	100,011	100,011	100,011	100,011	100,011
4. Income Taxes Paid	29,964	22,002	25,003	25,003	20,002	15,002	12,501
5. Effective Tax Rate	23%	17%	20%	20%	16%	12%	10%
6. Real after-tax Income	97,546	105,508	102,508	102,508	107,509	112,509	115,009

In terms of after tax income, with the exception of the low income person under the flat tax proposal, all the options lead to rising levels of after-tax income. These gains are obtained even though allowances for investments in credit unions and contributions to registered retirement savings plans are eliminated. The gains for the high income individual are the largest under both proposals, with his/her income rising by 17.8 percent in the case of the '12.5-20' proposal and 8.1 percent with the flat tax scenario. In general, therefore, the tax changes would lead to greater benefits for high-income individuals. However, given the positive economic gains likely from the tax changes, in terms of employment, the tax proposals could possibly lead to welfare gains.

4.3 Implementation Issues

Tax reforms, even if they are likely to result in welfare gains, increase uncertainty and can disrupt normal business operations in the transition period. The primary concern when thinking about tax reform in Barbados are the compliance and administrative costs of the proposal and how it fits into regional and international agreements. Compliance costs, broadly defined as all costs incurred to comply with the tax code, are one of the most important elements of a tax reform plan. Using standard utility theory, an economic agent is likely to continue to pay taxes up to the point where the marginal benefits equal the marginal cost/compliance cost. This would imply that taxes that have low compliance costs would, all things being equal, yield greater tax revenue.

Unfortunately, there have been no studies on the cost of compliance to the tax code in Barbados. One indicator of compliance cost that could be used is the ratio of individuals submitting tax returns as a ratio of the total employed population. This indicator may overestimate the compliance costs, since tax exemptions imply that individuals earning below the minimum threshold do not have to pay taxes. Nevertheless, it should be highly correlated with compliance cost in the long run. It is estimated that in 1987 the ratio of income tax returns to total employed labour force was just 19.1 percent. After the simplification of the tax system in 1992 this ratio rose to as high as 46.8 percent in 1998. Therefore, simplifying the system seems to have a positive impact on compliance in Barbados. In terms of the VAT, Alleyne and Howard (2003) report that most business persons thought that the VAT was a relatively costless changeover exercise, despite having to upgrade their information technology systems, change stationery and train staff. These costs were more prohibitive for smaller enterprises and most large entities already had good accounting systems in place.

Part of the problem in Barbados may simply be tax evasion given the high rates of both corporate and personal taxes. Alleyne and Howard (2003) report that most businesspersons thought that a reduction in rates of taxation would encourage more persons to pay taxes, as this would reduce the temptation for evasion. Both the FET and '12.5-20' proposal could therefore yield more revenue than expected, since those persons who were previous evading taxes could come into the tax fold due to the lower rates of taxes. With the FET, however, a number of issues would have to be clearly specified in the tax code to facilitate a smooth transition. For businesspersons, the distinction between investment and consumption expenses could be contentious. In this regard, simple rules are better than trying to outline a extensive list of items

that can be deducted for FET purposes. Additionally, if only real transactions are taxed, then there may be an incentive for individuals to shift their activities to financial intermediation as a means of tax avoidance. To account for this, authorities may be required to ask taxpayers for their financial transactions.

The administrative costs related to a new tax system is also important. At present, the cost of collecting tax revenues is less than 1 percent of revenues obtained. This is substantially lower than those in other countries, for example in the UK, Goodwin (1995) estimates that this proportion can reach as high as 4 percent. The '12.5-20' option is unlikely to significantly increase administrative costs as the system is already in place to collect this tax. However, the FET could lead to greater administrative costs in order to educate business and individuals about the tax change, print new tax forms and retrain tax officers.

The tax reform proposals also need to fit into the obligations made by Barbados in terms of the Caricom Single Market and Economy (CSME). Article 44 of the Revised Treaty of Chagaramus Establishing the Caribbean Community requires that the Council for Trade and Economic Development (COTED) and the Council for Finance and Planning (COFAP) "*adopt appropriate measures for ... convergence of macro-economic performance and policies through the coordination or harmonisation of monetary and fiscal policies, including in particular, policies relating to interest rates, exchange rates, tax structures and national budgetary deficits*". Although the Article does not specifically mention the issue of tax harmonisation, it has been broadly interpreted to imply this phenomenon.

There, however, exists no general framework for tax harmonisation in the CSME and the spread between tax rates in the various territories is quite wide: the Bahamas has a zero rate of tax on income and profits while Guyana's maximum corporate and income tax rate is 45 percent and 33.3 percent, respectively (see Table 7). Nevertheless, there is no reason that all member territories need to have the same tax rates as the macroeconomic structure of each state differs. Each country therefore should have rates consistent with their level of development goals and objectives.

Table 7: Regional Tax Comparison

Country	Top Corporate Tax Rate (%)	Top Personal Income Tax Tate (%)
Bahamas	0	0
Barbados	36	40
Belize	25	25
Guyana	45	33.3
Jamaica	33.3	25
Suriname	36	38
Trinidad and Tobago	35	38

Sources: Index of Economic Freedom.

5. Conclusions

Tax policies have played an important role in the development of Barbados. In the pre- and post-independence period, taxes were used as a redistributive device, while in the late 1970s and early 1980s they were employed to reduce the effects of the oil price shocks that occurred during the period and stimulate growth. The present system of taxation, however, seems to have skewed economic agents' preference away from savings towards consumption. Furthermore, Barbados, like most other offshore financial centres, has been under pressure to converge tax rates on domestic and offshore businesses. As a result, the present government plans to reduce the rate of corporation and personal income tax to 25 and 35 percent, respectively by 2006. Such a plan could result in a number of individuals attempting to benefit from the lower rate of corporate tax and there would still remain a large differential between onshore and offshore corporate rates.

This paper proposes a number of options for further tax reform that would not only reduce the tax burden on the average Barbadian, but would also address the gap between corporate tax rates. The options considered are the Hall and Rabushka flat tax and various changes to the present rate of tax on income and profits and the VAT rate, one of which is a reduction in the rate of personal and income tax to 12.5 percent, compensated by a rise in the VAT rate to 20 percent.

Using a tax simulation model, these proposals are likely to have a positive impact on economic growth, principally through greater investment and exports of services. The '12.5-20' plan has the greatest positive impact on overall economic growth, raising economic growth by a cumulative 17.9 percent over the 7 year period 2004-2010, compared to 5.5 percent for the flat

tax. The '12.5-20' scheme, however, is the most costly for the central government, as it would result in a expansion in government's fiscal deficit of 12.6 percent of GDP over seven years. In the long run, the rise in exports should only lead to a small deterioration in the external current account of the balance of payments under both options.

The impact of the various alternatives on representative individuals is also provided. The examples show that in most instances, after tax income should rise, with higher income individuals benefiting most from the tax change. The implementation issues related to each of the plans suggest that while the VAT and income tax proposals would be a relatively costless exercise for both government, private individuals and firms, the FET could result in additional expenditure due to cost that need to be incurred for training and for firms to reprogram their computer systems.

The study does not recommend a sudden change in the tax system under any of the options. For example, with the '12.5-20' scheme a gradual rise the VAT rate, and a composite reduction in the rate of tax on income and profits, seems the most viable implementation scenario as this would allow the government to monitor any implementation issues that may arise; for example, a rise in VAT arrears. Such an approach would also reduce any uncertainty that may accompany the new tax systems.

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Appendix 1
Tax Simulation Model

This appendix presents the structure of the small-scale macroeconomic model employed in this study to evaluate the impact of the various tax proposals. A number of conventions are applied. The subscript t denotes time: annual series are employed in all equations, Δ indicates the first difference operator, standard errors are shown in parentheses and p-values in square brackets. Basic diagnostic tests are also reported for each equation.

Demand and Output

Gross Domestic Product

$$GDP_t = \underset{(74.717)}{414.135} + \underset{(0.014)}{0.435}K_t + \underset{(0.018)}{0.565}L_t \qquad \text{(A1.1)}$$

$Adjusted\ R^2 = 0.975$

$Normality\ test = 1.667[0.434]$

$Thiel\ inequality\ coefficient = 0.029$

Capital Stock

$$K_t = (1-\delta)K_{t-1} + I_t \qquad \text{(A1.2)}$$

Employment

$$L_t = \underset{(12.494)}{42.813} + \underset{(0.007)}{0.022}I_t - \underset{(0.108)}{0.215}PTR_t^h + \underset{(0.239)}{0.714}PTR_t^l + \underset{(0.128)}{0.438}L_{t-1} \qquad \text{(A1.3)}$$

$Adjusted\ R^2 = 0.895$

$Normality\ test = 2.824[0.244]$

$Thiel\ inequality\ coefficient = 0.017$

Private consumption expenditure

$$C_t^P = \underset{(2.323)}{0.191} + \underset{(0.064)}{0.744}GDP_t / P_t \qquad \text{(A1.4)}$$

$Adjusted\ R^2 = 0.827$

$Normality\ test = 0.987[0.611]$

$Thiel\ inequality\ coefficient = 0.028$

Public consumption expenditure

$$C_t^G = C_{t-1}^G(1 + \%\Delta w_t^G / 100) \qquad \text{(A1.5)}$$

Public Investment

$$I_t^G = I_{t-1}^G(1.04) \qquad \text{(A1.5)}$$

Private Investment

$$I_t^P / GDP_{t-1} = \underset{(0.054)}{0.117} - \underset{(0.001)}{0.002}CTR_t + \underset{(0.203)}{0.469}I_{t-1}^P / GDP_{t-2} \qquad \text{(A1.6)}$$

$$Adjusted\ R^2 = 0.287$$

$$Normality\ test = 1.161[0.559]$$

$$Thiel\ inequality\ coefficient = 0.072$$

Finished Capital Goods

$$FCG_t = FCG_{t-1}(1.02) \quad \text{(A1.7)}$$

Stock of Finished Capital Goods

$$SFCG = 1/5\sum_{i=1}^{5} SFCG_{t-i} \quad \text{(A1.8)}$$

Exports of Goods and Services

$$EGS = 2.2SB_t \quad \text{(A1.9)}$$

Imports of Goods and Services

$$IGS = 1.452IMP_t \quad \text{(A1.10)}$$

Retail Price Index

$$P_t = 4.646 + 0.970P_{t-1} \quad \text{(A1.11)}$$
$$(0.936)\ (0.013)$$

$$Adjusted\ R^2 = 0.995$$

$$Normality\ test = 0.257[0.879]$$

$$Thiel\ inequality\ coefficient = 0.011$$

Foreign Income

$$FI_t = 1.05FI_{t-1} \quad \text{(A1.12)}$$

Fiscal

Personal Taxes

$$PT_t = -133.488 + 0.150(PTR_t^h/100)GDP_t + 0.169(PTR_t^l/100)GDP_t \quad \text{(A1.13)}$$
$$(41.615)\ (0.049) \qquad (0.044)$$

$$Adjusted\ R^2 = 0.908$$

$$Normality\ test = 1.966[0.374]$$

$$Thiel\ inequality\ coefficient = 0.060$$

Corporate Taxes

$$CT_t = -76.564 + 0.166(CTR_t/100)GDP_t \quad \text{(A1.14)}$$
$$(16.016)\ (0.013)$$

$$Adjusted\ R^2 = 0.874$$

$$Normality\ test = 0.232[0.891]$$

$$Thiel\ inequality\ coefficient = 0.079$$

Property Taxes

$$PRT_t = 0.024GDP_t \quad \text{(A1.15)}$$

Other Direct Taxes

$$OT_t = 0.009GDP_t \quad \text{(A1.16)}$$

Value-Added Tax Receipt

$$VAT_t = \kappa(VATR_t^{nt}\,0.86GDP_t + VATR_t^{t}\,0.14GDP_t) \quad \text{(A1.17)}$$

Excise Taxes

$$ET_t = -187.072 + 0.170IMP_t \quad \text{(A1.18)}$$
$$(25.115)\ (0.017)$$

$$Adjusted\ R^2 = 0.848$$

$$Normality\ test = 0.571[0.751]$$

$$Thiel\ inequality\ coefficient = 0.154$$

Import Duties

$$IMPD_t = 37.289 + 0.055IMP_t \quad \text{(A1.19)}$$
$$(16.762)\ (0.011)$$

$$Adjusted\ R^2 = 0.557$$

$$Normality\ test = 1.353[0.508]$$

$$Thiel\ inequality\ coefficient = 0.079$$

Other Indirect Taxes

$$OIT_t = 0.024GDP_t \quad \text{(A1.20)}$$

Non-Tax Revenue

$$NTR_t = NTR_{t-1} \quad \text{(A1.21)}$$

Post Office Revenue

$$POR_t = 0.0028GDP_t \quad \text{(A1.22)}$$

Wages and Salaries

$$WS_t = -242.413 + 7.609P_t + 0.927I_t^g \quad \text{(A1.23)}$$
$$(29.069)\ (0.442)\ \ (0.179)$$

$$Adjusted\ R^2 = 0.974$$

$$Normality\ test = 0.316[0.854]$$

$$Thiel\ inequality\ coefficient = 0.025$$

Goods and Services

$$GS_t = 0.33WS_t \quad \text{(A1.24)}$$

Capital Expenditure

$$CAPEX_t = 1.026CAPEX_{t-1} \quad \text{(A1.25)}$$

Levies, Stamp, transfers and subsidies and interest payments are taken from projections of the Central Bank of Barbados' forecasting model.

External

Merchandise Exports

$$MX_t = 87.593 + 0.177GDP_t^* + 0.460MX_{t-1} \quad \text{(A1.26)}$$
$$(72.218)\ (0.057) \qquad (0.132)$$

$Adjusted\ R^2 = 0.618$

$Normality\ test = 0.457[0.796]$

$Thiel\ inequality\ coefficient = 0.052$

Merchandise Imports

$$MIMP_t = -317.426 + 0.534GDP_t \quad \text{(A1.27)}$$
$$(144.079)\ (0.044)$$

$Adjusted\ R^2 = 0.897$

$Normality\ test = 0.765[0.682]$

$Thiel\ inequality\ coefficient = 0.041$

Services Balance

$$SB_t = 173.694 + 0.811GDP_t^* + 17.881\Delta P_t \quad \text{(A1.28)}$$
$$(77.780)\ (0.074) \qquad (10.896)$$

$Adjusted\ R^2 = 0.867$

$Normality\ test = 0.628[0.735]$

$Thiel\ inequality\ coefficient = 0.037$

Income Balance

$$INC_t = 51.904 - 0.030GDP_t + 0.609INC_{t-1} \quad \text{(A1.29)}$$
$$(25.864)\ (0.013) \qquad (0.216)$$

$Adjusted\ R^2 = 0.886$

$Normality\ test = 0.874[0.646]$

$Thiel\ inequality\ coefficient = 0.063$

Current Transfers

$$CUT_t = -110.079 + 0.217GDP_t^* \quad \text{(A1.30)}$$
$$(16.590)\ (0.018)$$

$Adjusted\ R^2 = 0.891$

$Normality\ test = 0.616[0.735]$

$Thiel\ inequality\ coefficient = 0.090$

Current Account Balance

$$CAB_t = MX_t + MIMP_t + SB_t + INC_t + CUT_t \quad \text{(A1.31)}$$

Private Capital Inflows

$$PCI_t = -27809.780 + 14.299Trend_t - 16.384CTR_{t+3} \quad \text{(A1.32)}$$
$$(4798.143)\ (2.423) \qquad (6.045)$$

$Adjusted\ R^2 = 0.665$

$Normality\ test = 2.283[0.319]$

$Thiel\ inequality\ coefficient = 0.222$

Public capital inflows projections are from the Central Bank of Barbados.

Short-term capital flows

$$STCF_t = 1/5\sum_{i=1}^{5} SFCG_{t-i} \quad \text{(A1.33)}$$

Capital Account Balance

$$CPAB_t = PCI_t + PUBCI_t + STCF_t \quad \text{(A1.34)}$$

Change in NIR

$$\Delta NIR_t = CAB_t + CPAB_t \quad \text{(A1.35)}$$

Monetary

Credit to the Non-financial Private Sector

$$\Delta CPS_t = -22.171 + 0.573\Delta GDP_t \quad \text{(A1.36)}$$
$$(25.013)\ (2.423)$$

$Adjusted\ R^2 = 0.397$

$Normality\ test = 2.089[0.352]$

$Thiel\ inequality\ coefficient = 0.024$

Domestic Deposits

$$DD_t = -1497.481 + 1.203GDP_t \quad \text{(A1.37)}$$
$$(192.729)\ (0.063)$$

$Adjusted\ R^2 = 0.942$

$Normality\ test = 0.882[0.653]$

$Thiel\ inequality\ coefficient = 0.055$

Variable Definitions

Variable	Definition
GDP	Gross Domestic Product
K	Capital Stock
L	Labour
δ	Depreciation
I	Total Investment
PTR^h	Marginal Personal Tax Rate
PTR^l	Basic Personal Tax Rate
C^p	Personal Consumption
P	Retail Price Index
C^g	Government Consumption
w^g	Public Sector Wages
I^g	Public Investment
I^p	Private Investment
CTR	Corporate Tax Rate
FCG	Finished Capital Goods
STCG	Stock of Finished Capital Goods
EGS	Exports of Goods and Services
IGS	Imports of Goods and Services
FI	World Income
PT	Personal Taxes
CT	Corporate Taxes
PRT	Property Taxes
OT	Other Direct Taxes
VAT	Value-Added Taxes
ET	Excise Taxes
IMPD	Import Duties
IMP	Imports
OIT	Other Indirect Taxes
NTR	Non-Tax Revenue
POR	Post Office Revenue
GS	Goods and Services
CAPEX	Capital Expenditure
MX	Merchandise Exports
MIMP	Merchandise Imports
SB	Services Balance
INC	Income Balance
CUT	Current Transfers
CAB	Current Account Balance
PCI	Private Capital Inflows
STCF	Short-term Capital Flows
CPAB	Capital Account Balance
Δ NIR	Change in NIR
Δ CPS	Credit to the Non-financial Private Sector
DD	Domestic Deposits

Appendix 2
Table A1: Allowances

	Current System	Flat Tax	VAT and Income Tax Reform				
			Option 1	Option 2	Option 3	Option 4	Option 5
Low Income Individual							
1. Self	17,500	17,500	17,500	17,500	17,500	17,500	17,500
2. 2 Children at Primary/Secondary School	2,000	2,000	2,000	2,000	2,000	2,000	2,000
3. 1 Children at University	1,000	1,000	1,000	1,000	1,000	1,000	1,000
4. Credit Union	1,500	-	-	-	-	-	-
5. New Shares of Public Companies/Mutual Funds	-	-	-	-	-	-	-
6. Contributions to Registered Retirement Savings Plan	-	-	-	-	-	-	-
7. Pension Plan Contributions	1,000	2,500	2,500	2,500	2,500	2,500	2,500
8. Home Improvement	-	-	-	-	-	-	-
9. Total Allowances	23,000	23,000	23,000	23,000	23,000	23,000	23,000
Middle Income Individual							
1. Self	17,500	17,500	17,500	17,500	17,500	17,500	17,500
2. 1 Child at Primary/Secondary School	1,000	1,000	1,000	1,000	1,000	1,000	1,000
3. 1 Children at University	1,000	1,000	1,000	1,000	1,000	1,000	1,000
4. Credit Union	3,000	-	-	-	-	-	-
5. New Shares of Public Companies/Mutual Funds	1,000	-	-	-	-	-	-
6. Contributions to Registered Retirement Savings Plan	1,000	1,000	1,000	1,000	1,000	1,000	1,000
7. Pension Plan Contributions	2,000	2,000	2,000	2,000	2,000	2,000	2,000
8. Home Improvement	1,000	1,000	1,000	1,000	1,000	1,000	1,000
9. Total Allowances	27,500	23,500	23,500	23,500	23,500	23,500	23,500
High Income Individual							
1. Self	17,500	17,500	17,500	17,500	17,500	17,500	17,500
2. 1 Child at Primary/Secondary School	1,000	1,000	1,000	1,000	1,000	1,000	1,000
3. 1 Children at University	1,000	1,000	1,000	1,000	1,000	1,000	1,000
4. Credit Union	3,000	-	-	-	-	-	-
5. New Shares of Public Companies/Mutual Funds	10,000	-	-	-	-	-	-
6. Contributions to Registered Retirement Savings Plan	4,000	4,000	4,000	4,000	4,000	4,000	4,000
7. Pension Plan Contributions	2,000	2,000	2,000	2,000	2,000	2,000	2,000
8. Home Improvement	2,000	2,000	2,000	2,000	2,000	2,000	2,000
9. Total Allowances	40,500	27,500	27,500	27,500	27,500	27,500	27,500