



CONSUMER IMPORTS AND THEIR IMPACT ON INDIRECT TAX REVENUE IN  
BARBADOS

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#### *ABSTRACT*

*Consumer imports have played a vital role in the development of Barbados over the years. It is not difficult to see the link between these imports and indirect taxes since, when consumer items arrive into Barbados, these are subject to import duties, value-added taxes and in some cases, excise duties, all components of indirect taxes, which represent the major tax revenue category of the Government of Barbados. With rising indirect taxes, a Government can use some of these funds to develop a country's infrastructure and enhance its development. Although some reduction in savings is expected from an expansion in consumer imports (especially if financed by a drawdown in deposits), this loss can be minimised if some of the taxes collected from such an increase are directed into foreign exchange earning activities. This paper uses regression analysis to see to what extent changes in consumer imports will influence indirect taxes in the long and short run between 1970 and 2001. The results show that in the long run, a per unit change in consumer imports will boost indirect taxes by 0.46% while in the short run, a similar change in consumer imports will increase indirect taxes sharply by 0.78%. This implies a significant impact on Government's fiscal account in the short run, with some slowing anticipated over the medium and long term.*

#### **1 Introduction**

The high dependence on goods purchased from abroad or the high propensity to import items is a well-known characteristic of small open economies such as Barbados. These items are disaggregated into consumer imports, capital imports and intermediate imports. Consumer imports account for the largest portion of retained imports, averaging some 42% of the total. They comprise non-durable and durable items. Non-durable items include food and beverages, pharmaceuticals, stationery, toiletries, clothing, personal effects and cigarettes. On the other hand, durable items include motorcars, air conditioners, televisions, radios, refrigerators, stoves, furniture and record players and records.

The relationship between consumer goods and indirect taxes is well known. As these goods arrive at Barbados' port of entry, import duties, value-added taxes (VAT) and in some cases excise taxes are charged on the items of the respective recipients. The three items mentioned are all components of indirect tax collections. Therefore, it may not be too difficult to assume that, all things being equal, any attempt to boost or restrict the movement in consumer imports has the potential to impact on indirect tax revenues and by extension, the Government's fiscal balance.

Several papers have looked at determinants of either consumer imports or some components of this variable. However because of the importance of consumer imports in generating Government revenues, the writer has decided to adopt a slightly different slant to that of previous writers and to find out to what extent consumer imports influence indirect tax collections. It is with these many facts in mind that this paper is being written. Section 1 will look at a literature review of consumer imports. In section 2, some trend analysis will be done on consumer imports in Barbados while in the following section, regression analysis will be used to see the extent to

which consumer imports impact on indirect taxes in the long and short run. This will be followed by a conclusion.

## **2. A Short Literature Review On Consumer Imports**

The literature on consumer imports has been tackled from a variety of angles by several authors. Evans [1975, pp 150 – 183] and Gargantas [1975, pp 610-642] focused on a specific category of consumer imports, namely consumer durables with specific emphasis on motor cars and their determinants. Evans fitted an equation for motorcars in the USA using quarterly data from 1948 to 1964, whereas Gargantas used quarterly data from 1957 to 1970 for the United Kingdom. In the case of the study by Evans, the variables that impacted mainly on motor cars were relative prices and supply shortages. On the other hand, Gargantas discovered that the weighted average of present and past disposable incomes, new credit granted for hire purchase, the level of repayments and the stock of motor cars in the previous period were the variables that influenced motor cars.

Holder [1986, pp 1227-1232] sought to examine the determinants of consumer durables in Barbados with the use of regression analysis between 1960 and 1982 and to judge the effectiveness of two major policy instruments, credit and hire purchase regulations. He discovered that real income, the consumption to income ratio, relative prices, loans to the personal sector and hire purchase credit helped to explain the dependent variable. His analysis and results implied that both monetary and fiscal policy had a strong role to play in determining expenditure on durables. A major implication of the study was that since credit rather than interest rates influenced expenditure, the present policy of selective controls and changes in hire purchase terms and conditions was an appropriate policy. By this, he meant that controls were effective whilst being discriminatory.

Panagariya [1994, pp 1-3] attempted to advance reasons that supported the liberalisation of consumer imports in India. He argued then that in India, the rupee was highly undervalued and if left to market forces, some appreciation could occur. Since the competitiveness of India's exports would be undermined by such appreciation, the Reserve Bank of India (RBI) defended the current exchange rate by purchasing several billion dollars in return for rupees during the previous year. In his opinion, this solution was only temporary since the expansion of money supply needed to defend the dollar at the current exchange rate was inflationary and would eventually erode the competitiveness of India's exports. A partial solution was to liberalise consumer imports, which will prop up demand for dollars and release the pressure on the RBI to purchase them in return for rupees.

The second reason advanced by the above-mentioned author for the liberalisation of consumer imports stemmed from the usual efficiency considerations. He felt that by curbing luxury consumption, India had, for a long time, been penalising its customers and protecting domestic producers of sub-standard products. The availability of high quality foreign goods would make the consumer more discriminating and force domestic producers to upgrade the quality of their products.

Jordan [1998, pp 83-99] used cointegration techniques to estimate an imported consumer goods demand function for Barbados with the use of annual data from 1973 to 1997. His findings were that non-traditional variables such as the net international reserves played an important role in explaining consumer behaviour and could be used by Governments to gauge consumer patterns for a particular year.

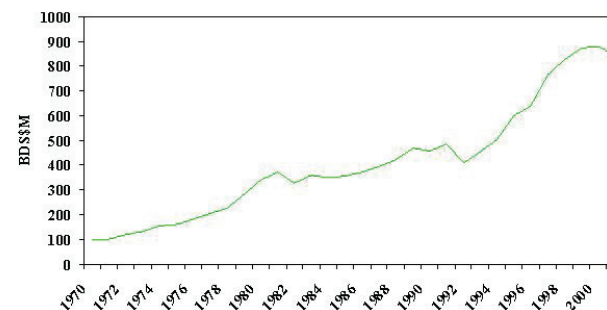
The study done by Campbell and Sealy [2000, pp 31-38] set out to determine the long and short run variables that influenced motorcar imports for Barbados, using regression analysis from 1970 to 1999. It should be noted that in Barbados, motorcar imports represent the single largest item of consumer durable imports. This study revealed that in the long run, motorcar imports were explained by real income, commercial bank credit, bank repayments, relative prices, the unemployment rate and a dummy variable representing the 1990-1992 period when Barbados entered into a stabilisation programme with the International Monetary Fund. In the short run, real income, commercial bank credit, bank repayments and relative prices were the variables of importance.

### 3. Trends In Consumer Imports In Barbados

During the period 1970 to 1973, consumer goods were recorded at approximately \$316.6 million, some 33% of total foreign exchange outflows. From a value of \$97.4 million in 1970, consumer imports reached the \$100 million mark for the first time in the following year (\$100.2 million) and went on to total \$133.9 million by end-1973 (see Figure 1). Food and beverages accounted for the largest proportion of non-durable items (80%) and indeed total consumer items (51%) while as mentioned earlier, motorcar imports represented the single largest item of durable imports.

Figure 1

## Consumer Imports in Barbados



Source: Central Bank of Barbados

The sharp deterioration of the balance of payments induced the Central Bank of Barbados to take stringent measures in an effort to redress the situation. Consequently the Hire-Purchase, Credit Sale and Hire Control Act 1975-34 was employed and limits were placed on credit to the distribution and personal sectors. Interestingly enough, the issue of import licences for the import of motorcars was suspended and several items were placed on licence or embargoed [Campbell, 1993, pp355-369]. Despite this move, consumer imports grew marginally as the fall in motorcar imports was offset by higher purchases of food and beverages and miscellaneous imports.

With a good performance in the foreign exchange earning sectors, there was some ease in Central Bank policy in 1978 and 1979. This resulted in robust growth in personal credit accompanied by high consumer demand (despite quotas on motor cars), a pattern that continued until 1981. It was during that year that Barbados' foreign exchange receipts were affected by the economic

recession in industrial countries. Measures to raise interest rates and reduce credit to the personal sector were implemented and this led to a decline in consumer imports.

From 1982 (when the abandonment of quotas on motor cars took place) until 1989, increases were generally recorded for consumer imports as the Central Bank, for the most part, lowered interest rates and eased its restrictions on access to bank credit by the distributive and personal sectors so as to boost consumer spending. However in the latter part of that year, as deposit growth slowed and private sector credit expanded, liquidity in the banking system tightened significantly. Consequently, the minimum interest rate on savings deposits and the average lending rate were increased and ceilings imposed on the level of personal and distribution credit at financial institutions, thereby reducing consumer goods.

In the next two years, consumer goods decreased significantly as a result of the policies of an eighteen-month stabilisation programme implemented by the Government of Barbados with the assistance of the International Monetary Fund (IMF). One of the aims of this programme was to reduce aggregate demand in order that the foreign reserves (the liquid assets of which, at end-September 1991, represented a mere two weeks of import cover) might be restored to some level of respectability.

Between 1993 and 2001, consumer imports continued to grow, with sharp increases occurring in 1997, 1998 and 1999. During these years, this category benefited from a surge in re-conditioned motorcars from abroad. However some slowing in consumer imports was recorded in the years that followed.

So far, no mention has been made on Barbados' direction of trade with regard to consumer imports. Data have indicated that between 1995 and 2001, the majority of Barbados' consumer

imports are purchased from the United States of America (USA), followed by CARICOM, the United Kingdom (UK), Canada and Japan. Some 53% of retained consumer goods are purchased from the USA, 16% from CARICOM, 13% from the UK, 11% from Japan and the remainder from Canada. The choice of goods bought from these countries is quite interesting. The non-durable items supplied by the USA to Barbados include mainly food and beverages, clothing, toiletries and pharmaceuticals. In the case of durable imports, the main purchases undertaken by Barbados from the USA are furniture, televisions and radios, refrigerators and stoves and record players and records. Whereas the selection of non-durable goods purchased by Barbados from the UK is similar to that bought from the USA, however, the major category of durable items purchased from the UK is motorcars. Food and beverages and pharmaceuticals are the major non-durable goods bought from Canada while air conditioners and record players and records account for some of the major durable items. CARICOM's exports of consumer items to Barbados are mainly food and beverages in the case of non-durables, and furniture in the case of durables. Very few non-durable goods are purchased by Barbados from Japan but as far as durables are concerned, Barbados imports a large amount of motorcars from this country. For example, in 2000, the amount of motorcar imports bought from Japan (\$61.8 million) was approximately twenty times higher than the average motorcar imports from the remaining countries. It should also be noted that food and beverages represent 37% of consumer goods purchased from the USA, 60% of consumer goods purchased from Canada, 32.6% of consumer imports from the UK and 63% of consumer goods bought from CARICOM states.

#### **4. Determinants of Indirect Taxes in Barbados**

The following variables have been considered as explanatory variables of indirect taxes for Barbados; real foreign income, real local income, consumer imports, commercial bank credit and a dummy variable. As the world economy grows, foreign incomes of countries should rise. This

would allow for a better opportunity for tourists to visit Barbados. When tourists purchase more items in Barbados, indirect taxes should increase because of a higher intake from value-added taxes (VAT). As the real income of Barbados rises, this should result in higher spending by locals and hence an increase in indirect taxes. An increase in consumer imports should boost indirect taxes on account of growth in import duties, VAT collections, stamp duties and excise taxes. The relationship between credit and indirect taxes should be positive since, with more credit available to businesses individuals, spending on goods and services should be boosted and this should lead to an expansion in indirect tax revenue. One should anticipate an inverse relationship between the dummy variable and indirect taxes since the implementation of a lower indirect tax regime in 1997 should result in a decline in revenues of this category.

#### 4.1 Model Specification

Formally, we can write a model of indirect taxes in the following way:

$$LITAX = F(LFY, LDY, LCON, LCRED, DUMMY) \quad (1)$$

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where ITAX is real indirect tax collections, FY represents real foreign income, DY is real local income, CON is real consumer imports, CRED is real commercial bank credit and DUMMY is a dummy variable representing the period of 1997 when the indirect tax system was revised. The positive and negative signs that appear under each explanatory variable represent the type of relationships that are anticipated with the dependent variable, indirect tax collections. The ordinary least squares (OLS) technique has been used and the model estimated in logarithms.

#### 4.2 Data and Variables

The data used in this paper, annual data, cover the period 1970 to 2001. The sources of this data are the Annual Statistical Digest of the Central Bank of Barbados and the International Financial Statistics Yearbook published by the International Monetary Fund.

In the calculation of foreign income, three countries were considered, namely the USA, UK, and Canada, three of Barbados' major trading partners. Real gross domestic product at 1990 prices was taken for each country, thereafter weighted by their respective share of tourist arrivals and their resulting totals then summed. Real gross domestic product at 1990 prices was used as a proxy for real local income. The dummy variable was assigned values of zero prior to 1997 and one thereafter. The econometric software package EVIEWS 4.0 was used to perform the estimations.

#### 4.3 Results

The Johansen Procedure [1988, pp231-254] was used to determine the number of cointegrating relationships that existed. When it was established that only one cointegrating relationship existed, then the Engle-Granger two-step method was applied. In this model, the coefficients from the cointegrating regression are estimated and then the residuals from the estimate are taken and used in their lagged form in a Vector Autoregression (VAR) of the changes of the explanatory and dependent variables. This method is preferred to the Johansen (1988) maximum likelihood approach because it is more powerful in small samples [see Inder, 1988, pp53-68].

The order of integration for each series was determined by the use of the Augmented Dickey-Fuller (ADF) test [1979, pp 427-431], which is a test of the null hypothesis of non-stationarity or a unit root (integrated of order d, where  $d \geq 1$ ) against the alternative hypothesis of stationarity (or integrated of order zero, I(0)). The ADF tests of the differences of each variable indicate that all of the variables are integrated of the first order, that is, I(1).

The long run results are shown in equation 2.

$$\text{LIT} = -7.30 + 0.44\text{LFY} + 0.25\text{LDY} + 0.46 \text{LCON} + 0.72 \text{LCRED} - 0.24 \text{DUMMY}.$$

(2)

$R^2 = 0.993$ ,  $\text{Adj. } R^2 = 0.992$ , Durbin Watson (DW) = 1.42, ADF = -4.803 (-3.6661), PP = -4.2408 (-3.6576).

The above equation is the Engle-Granger (EG) cointegration regression.

However, it should be noted that the bias in the EG estimator of the long run relationship could be significant on account of the small sample size. Consequently, the standard errors and the t-values of the estimated regression coefficients are not reported as these statistics are not valid [for further reading, see Banerjee, Dolado, Hendry and Smith, 1986, pp253-278].

The ADF and Phillips-Perron (PP) tests reject the null hypothesis of stationarity at the 5% and 1% levels of significance, implying that in the long run, all of the variables are cointegrated. The DW statistic indicates no first order serial correlation.

All of the five explanatory variables have the correct sign. Per unit increases in real foreign and local incomes will boost indirect taxes each by almost 0.44% and 0.25% while a 1% rise in commercial bank credit will lead to a 0.72% growth in indirect taxes. The coefficient of commercial bank credit is interesting. Barbados has been experiencing high levels of liquidity in the banking system for the last two and a half years and this result shows that if steps are taken by the authorities that will assist the commercial banks in reducing some of their liquidity, then the Government stands to benefit from indirect tax collections. The sign of the dummy variable was negative as expected. What about consumer imports? This model shows that, all other variables remaining constant, a 1% rise in consumer imports will increase indirect tax collections by 0.46%, indicating a moderate relationship between the two variables.

We now seek to examine the short run impact of consumer imports on

indirect tax collections. In this regard, we are guided by the error correction model, which nests the long run behaviour and short run dynamics. According to Engle and Granger [1987, pp251-276], an error correction model of variables can be formulated as long as those variables are cointegrated. In this study, consideration is also given to the use of the Hendry General to Specific Methodology, which begins with a model that is over parameterised and with the use of a step-wise process, eliminates all insignificant variables until a parsimonious representation of the model is obtained. The results of the Engle Granger equation are shown below:

$$\begin{aligned} \Delta \text{LIT} = & 0.031 + 0.20 \Delta \text{LFY} + 0.191 \Delta \text{LFY}_{-1} + 0.52 \Delta \text{LDY} - 0.42 \Delta \text{LDY}_{-1} + \\ & (2.098) (1.806) \quad (1.815) \quad (2.631) \quad (-2.588) \\ & + 0.78 \Delta \text{LCON} - 0.457 \text{U}_{t-1} \\ & (5.117) \quad (-2.016) \end{aligned} \quad (3)$$

$R^2 = 0.777$   $\text{Adj. } R^2 = 0.720$   $\text{DW} = 1.56$   $\text{B-G (prob} = 0.34)$   $\text{NORM (prob} = 0.25)$   $\text{ARCH (prob} = 0.40)$   $\text{ADF} = -3.985 (-3.6852)$   $\text{PP} = -4.260 (-3.6752)$ .

The numbers directly under the coefficients in equation 3 are the "t" statistics.  $\text{U}_{t-1}$  is the error correction term lagged one period with all other variables having been described before.  $\Delta$  is the first difference operator,

B-G is the Breusch-Godfrey Lagrange Multiplier test for serial correlation, NORM is the Jarque-Bera test for normality based on a test of kurtosis and skewedness of residuals. ARCH is the Engle's  $k^{\text{th}}$  order autoregressive conditionality heteroscedasticity test statistic.

The results show that the model is adequately specified and does not violate the classical assumptions of normality, homoscedasticity and serial correlation. Both the  $R^2$  and the adjusted  $R^2$  provide a good fit.

Three of the five variables help to explain indirect tax revenue in the short term, namely, consumer imports, real foreign income and real local income. Indirect taxes stand to be boosted by 0.38% from a per unit expansion in real foreign income over the present and previous period, whereas over a similar period, a per unit rise in real local income will increase indirect tax collections by 0.10%. These two results show the importance to Barbados of a robust world economy as well as a strong domestic economy.

In the case of consumer imports, in the short run, not only does this variable exhibit a strong relationship with indirect taxes but it is also highly significant as indicated by its "t" statistic value. A 1% rise in this category will boost indirect taxes by 0.78%, a very robust result and far stronger than the impact of any of the other explanatory variables on the dependent variable. This compares with an expansion of 0.46% over the medium and long term. This result implies that in using this model, if Barbados is desirous of tackling any shortfall in indirect tax revenue almost immediately, this can be done by putting measures in place to stimulate consumer import demand, assuming of course that there is consumer confidence. One measure coming to mind immediately is a lower rate of personal income tax, which was implemented from January 1, 2003. It must however be noted that since consumer imports put pressure on Barbados' foreign reserves, which are the lifeblood of the economy, then the foreign exchange position of the country must always be analysed when making decisions of this nature. It is therefore preferable that in attempting to stimulate consumer demand, one should ensure that the loss in foreign reserves from this activity should be outweighed by gains in foreign reserves from the foreign exchange earning sectors. The error correction term is negative and significant, which confirms the long run cointegrating results, and its coefficient of 0.457 indicates a moderate speed of adjustment to its new long run relationship.

## CONCLUSION

This paper has attempted to look at consumer imports and their long and short run impact on indirect tax collections in Barbados over the period 1970 to 2001 with the use of regression analysis. It was shown that the majority of Barbados' consumer goods are imported from the USA, followed by CARICOM, the UK, Canada and Japan. The food and beverages category accounts for the largest of the non-durable items purchased from all of the countries mentioned with the exception of Japan. The motorcars' category represents the single largest durable import by Barbados and most of these cars are imported from Japan. However other durable items purchased from the five countries mentioned earlier are televisions and radios, refrigerators and stoves, air conditioners and record players and records.

This paper has also reported that based on the model presented, in the long run, a per unit rise in consumer imports would lead to 0.46% growth in indirect tax revenue whereas in the short term, a similar rise in consumer goods would boost indirect taxes by 0.78%, slightly more than twice the long run impact. This suggests that if Government is desirous of boosting its indirect tax revenues in an attempt to improve its fiscal balance, it can put measures in place to stimulate consumer demand. One measure mentioned in this study is a lower personal tax rate, which was implemented with effect from January 1, 2003. A decline in this rate will provide consumers with higher disposable income and create a greater incentive to spend. However it should be noted that while increased consumer spending will improve Government's fiscal account, when putting measures in place to increase consumer demand, the foreign exchange position of a country like Barbados cannot be overlooked. Foreign reserves are the lifeblood of the Barbadian economy and it is therefore desirable that any loss of foreign reserves arising from rising consumer demand should be more than offset by a strong performance from its foreign exchange earning sectors.

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