



**MEASURING FINANCIAL DEVELOPMENT IN BARBADOS:  
1978 - 1998**

by

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**ABSTRACT**

This paper constructs a new index for measuring financial development in Barbados that is based on key characteristics of the financial system. The results indicate that Barbados has improved its level of financial development during the period 1978 to 1998 and this may be attributed to an increase in the availability of new financial products and a more open financial system. Also, it was found that the Monetary Authority has utilized most of the monetary instruments available worldwide throughout the period. Of major concern is the under development of the market structure and the financial liberalization segments of the financial system..

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### 1. Introduction

It is widely believed that financial development is an important influence on economic growth. Levine(1997) provides an excellent survey of the empirical evidence to support this result. However, one important part of these studies surveyed by Levine, that could put this financial development influence economic growth result in doubt is how financial development is measured. Most of this work has used monetary aggregates like the ratio of broad money to Gross Domestic Product as a proxy for financial development. Pill and Pradhan (1995) point out that these conventional measures of financial development may give misleading signals since they overlook important factors, such as the openness of the country to capital flows, the extent of public borrowing from the domestic financial system, the development of non-bank financial institutions and the competitiveness of the banking system. Recently, La Porta et al (1997) have added the existence of a legal environment conducive to the protection of the rights of the creditors and the enforcement of contracts. Therefore, by analysing the institutional environment and the incentive structure in which the financial players operate, one may be able to draw conclusions about the level of financial development and growth.

Gelbard and Leite (1999) used the above approach to establish an index of financial development from a set of six indices representing key characteristics of the financial system in thirty eight sub-Saharan African countries. This paper utilises a similar survey of financial sector characteristics to construct a set of indices of financial development for Barbados over the period 1978-1998. Thus, this study looks at the development of the financial sector of a particular country overtime as opposed to a group of countries at a specific point in time. In this way, a more careful and in depth examination of the institutional and historical characteristics of the particular country can be undertaken. Also a single country approach is not constrained by the possible measurement inconsistencies across countries.

Section II presents the broad framework of the multifaceted index of financial development. Section III discusses the results and the final section contains concluding statements.

## II. A Multifaceted Index of Financial Development

To construct an overall index of financial development several sub-indices were developed. The sub-indices used represent different aspects of financial development namely, the market structure, the financial products available, the financial liberalization process, the institutional environment, the financial openness and the monetary instruments that are in place. Each of these aspects reflects a number of specific characteristics or attributes which were obtained from the data bank at the Central Bank of Barbados, as well as, by the interview process, from Government agencies, non-bank financial institutions and professionals in the respective fields. Answers to individual yes or no questions were assigned values of 0 and 100, while answers to questions relating to time periods or quantitative variables were converted into a 0-100 scale based on the range of values of the whole sample. The minimum value for an attribute is subtracted from each of its entries in turn. The result is then divided by the difference between the maximum and the minimum of the attribute. In this way, the minimum value of the attribute becomes equal to 0 and the maximum value becomes equal to 100. The following two formulae reflect this conversion process:

$$d_j = ((k_j - \text{Min}) / (\text{Max} - \text{Min})) * 100 \quad (1)$$

$$d_j = ((k_j - \text{Max}) / (\text{Min} - \text{Max})) * 100 \quad (2)$$

where  $j$  is the  $p$  attribute,  $k_j$  is the value of the attribute  $j$ ,  $\text{Min}$  is the minimum value of the  $p$  attribute,  $\text{Max}$  is the maximum value of the  $p$  attribute and  $d_j$  is the measurement within the 0-100 scale of that attribute. Equation (1) was utilized for variables where a higher figure is associated with a desirable feature of the financial system, for example, the bank concentration ratio, and Equation (2) was used for variables where a higher figure is associated with a less desirable feature of the financial system, for example, the share of non-performing loans.

Each sub-index is the simple average of the values associated with the attribute and the overall index is a simple average of all the sub-indices. No weights have been assigned to the index which means that each attribute of financial development used was given an equal weight and each attribute of the corresponding sub-indices was weighted equally as well.

## III. Results

The result of each sub-index and the overall index was grouped into four categories, 0-25 was deemed undeveloped, 26-50 minimally developed, 51-75 somewhat developed and 76-100 largely developed.

### Market Structure

#### Box 1. The Market Structure Index

- Bank concentration ratio
- The minimum risk-based capital adequacy requirement
- Share of private banks' in total loans and deposits
- Spread between lending and deposits rates
- Share of non-performing loans in commercial banks portfolio
- The existence of financial institutions other than commercial banks

The market structure index seeks to determine the competitiveness of the financial system. The attributes used to develop this index are shown in Box 1. For the bank concentration ratio, the Herfindahl index was utilised and this was applied to the three largest banks. The minimum risk-based capital adequacy requirement was calculated for four years and was greater than the 8% proposed by the Basel Committee on Banking Supervision.<sup>1</sup> The minimum capital ratio requirements is 4% for tier one capital and 8% total (tier one plus tier two) capital in relation to risk-weighted assets<sup>2</sup>. Data on the minimum risk-based capital adequacy requirement was only available for the period 1995-1998 and therefore was not included in the final index. However, for this period, the average change in the overall financial development index, as a

<sup>1</sup>The Basel Committee on Banking Supervision is a committee of banking supervisory authorities which was established by the Central Bank Governors of the Group of Ten countries in 1975 to set minimum capital requirements for internationally active banks.

<sup>2</sup>Tier one capital is the core capital which consists of permanent shareholders' equity, perpetual preferred stock and retained earnings. Tier two capital may include limited life preferred stock, subordinated debt and loan loss reserves up to a certain limit.

result of the inclusion of the minimum risk-based capital adequacy requirement, was less than one percentage point.

The market structure index reveals that the market structure of the financial system was undeveloped at the beginning of the period and again in 1991 and 1992. For the rest of the period under review, it may be described as minimally developed (Table 1). In 1983, there was an indication of growth in financial development as it grew to 40.5%, but this was followed by a period of decline. The largest decrease which was in 1991 and 1992, may be attributed to the stabilization program introduced by Government during that period to correct Balance of Payment difficulties. The spread between the lending and deposit rates was at its highest, 8%, in 1991 and the share of nonperforming loans was 12% in 1992. After reaching its lowest point in 1992, 18.7%, the index climbed to its highest point to date, 46.8%, in 1998.

The bank concentration ratio was around 40% depicting a moderate concentration of banks. The share of private banks in total loans and deposits was over 80%, which is primarily due to the existence of one public commercial bank in Barbados. The interest rate spread was between 5.4% and 8% and the share of non-performing loans reached 12% in 1992, which coincided with the stabilization era, but declined to 3% at the end of the period.

#### *Financial Products*

The financial products index seeks to measure the number and availability of financial products in the country. This translates into the relative competitiveness of the financial sector and the relevant questions are seen in Box 2. Up until 1986, Barbados was minimally developed but for the remainder of the period it may be classified as somewhat developed (Table 1).

In 1986 there was a 30.0% increase in the index when mutual funds became available, and growth of 23.1% was recorded the following year with the establishment of the Securities Exchange. In 1991, there was a further increase, 18.8%, when debit cards were introduced into the banking system. Since 1991, Barbados is categorized as somewhat developed although interest is not paid on demand deposits generally and the stock exchange has not reached its true potential.

#### **Box 2. The Financial Products Index**

- Is interest paid on demand deposits?
- Does the non-financial private sector hold government securities?
- Are there government securities with more than one year maturity?
- What is the maximum maturity of time deposits?
- What is the maximum maturity of bank lending operations?
- Is there a stock exchange?
- Do banks issue debit/credit cards?
- Are there interbank transactions in (a) foreign exchange (b) loans (c) bank certificates of deposit or acceptances (d) commercial paper (e) government securities?
- Are Mutual funds available?

The commercial banks in Barbados do not generally pay interest on demand deposits. In rare cases, interest is paid on the special accounts of their best customers. There are five types of Government securities, with short, medium and long term maturity, available on the market. Treasury bills, which were first issued in 1967, are defined as short term securities and usually have a three month maturity, but may be for a period of up to one year from the date of issue. Tax refund and tax reserve certificates are considered medium term securities, with maturities of five years and two years respectively. Treasury notes are those medium term instruments which can mature within a range of one to ten years. Debentures are long term securities maturing after ten years. Savings bonds are also available as another means of investment.

According to the Central Bank of Barbados records, the non-financial private sector held government securities from 1968. At commercial banks the maximum maturity of time deposits is three years while it is five years in the non-financial private sector. The bank lending operations can be divided into mortgage and other loans and the maximum maturity of their lending operations is thirty and ten years respectively.

The Securities Exchange of Barbados (SEB) was established in 1987. Companies listed on the SEB have to meet certain basic criteria and in return their shares become more marketable and accessibility to funds

is easier. An unlisted Securities Market was introduced in 1992 to assist companies which do not qualify for full listing. The SEB's performance is very limited since only 18 companies were listed in 1998, resulting in 1,560 trades in 100 trade days. Market capitalization, including data for cross listed securities closed at \$4.824 billion and the index was 2,794.41 points.

Commercial banks issued debit cards as early as 1991, but credit cards came on stream in 1994. There were interbank transactions in the categories highlighted (see Box 2) in some banks as early as 1956 although they became effective various times throughout the banking sector as a whole. Since interbank transactions in foreign exchange, loans, bank certificate of deposit, commercial paper and government securities were all available during the period under review an average of the five areas was used. Mutual funds were introduced in 1986 with the Mutual Funds Act 1998-45 passed in December, 1998 (Ficca, 2000).

#### *Financial Liberalization*

##### **Box 3. The Financial Liberalization Index**

- Are interest rates liberalized?
- How many years have real lending interest rates been positive?
- How many years have real deposit rates been positive?
- Is an informal financial sector significant?
- Are selective credit controls absent?

The financial liberalization index seeks to measure the effect controls have on the financial system. The questions asked are listed in Box 3. The financial liberalization index shows Barbados was minimally developed until 1993 when all ceilings on credit and credit controls were discontinued. After 1993, the index reveals that the financial system became somewhat developed in this area (Table 1).

When the Central Bank began operations in 1973 the maximum interest rate on deposits was fixed at 8% under the provisions of the Interest Rate Act 1970-47 (Saunders and Wood, 1997). Interest rates were permitted to float for a brief period in 1973 but since then ceilings and floors were re-established at varying levels.

Government's intervention policy measures include ceiling on interest rates below market clearing levels, high reserve requirements and overall and selective credit ceilings. Government uses the level of interest rates in the banking sector to channel credit towards projects or sectors that are designated as crucial to the economic development of the country. Therefore interest rates are active monetary policies and therefore are not liberalized in the full sense.

From 1974, foreign borrowing by commercial banks to finance domestic credit operations was restricted and permission had to be given by the Central Bank of Barbados. Ceilings were placed on credit outstanding mainly in the personal and distribution sectors. The Hire-Purchase Credit-Sale and Hire-Control Act 1975-34 came into force in 1977, and gave the Central Bank the power to control all credit in these areas. These controls were used as a policy tool by the Central Bank to channel credit into the productive sectors of the economy, especially when the balance of payment position was threatened. Barbados has managed to prevent the development of an informal financial sector.

#### *Institutional Environment*

##### **Box 4. The Institutional Environment Index**

- Is most land privately owned?
- Are most buildings privately owned?
- Is it easy to transfer ownership of land or real estate?
- Are land and property registries considered adequate?
- Is it generally easy for creditors to recover debts through the judicial system?
- Is commercial legislation considered adequate?
- Is there a law on the use of cheques?

The institutional environment index shows whether the institutional environment promotes the development of the financial sector. The relevant areas are listed in Box 4. Barbados was minimally developed up until 1997, and afterwards it may be considered somewhat developed (Table 1). Most land in Barbados is privately owned according to the Land Tax department, and at the end of 1998 the percentage of land and

buildings owned by the private sector was 96.8 and 97.7 respectively. However the judicial system may be considered inadequate as it is generally difficult to recover debt. This process may take between one year and three years.

The Land Registration Act makes provision for the registration of titles to land and for all transactions in registered and unregistered land. The land registry may be considered fairly inefficient up until 1997 when a computerized system was introduced. The transfer of ownership of land or real estate depends on whether the land is registered or unregistered, and, as can be expected, unregistered land takes a longer time to process. The waiting period of an application may be between three to six months. Commercial legislation is considered adequate and there is no law on the use of cheques.

### *Financial Openness*

#### **Box 5. The Financial Openness Index**

- Are there significant restrictions to the purchase of domestic financial assets by non-residents?
- Are there significant restrictions to the purchase of foreign exchange by residents?
- Is there a parallel market for foreign exchange?
- Are there no significant restrictions on the purchase of foreign financial assets by residents?
- Has the country accepted the obligations under Article VIII, Sections 2, 3, and 4 of the IMF articles of agreement?
- Is there a multiple exchange rate system?
- Is there a forward exchange market?
- Is there an exchange tax?
- Are there controls on interest payments?
- Are there controls on profits /dividend payments?
- Are there repatriation requirements for service earnings?
- Are there controls on liquidation of direct investment?

The financial openness index shows the degree of openness of the financial system. In Barbados this is

clearly linked to the existence of exchange controls. Exchange controls are the set of procedures which Government use to monitor and regulate the flows of foreign exchange into and out of the country. Barbados' financial system was somewhat developed for the entire period under review (Table 1). There was a deterioration in the index in 1980 when the Central Bank instituted exchange control fees on applications for non-trade payments and the transfer of real property. The acceptance of Article VIII of the IMF articles of agreement and then the abolition of the exchange control fees caused an improvement in the index in 1993 and 1996 respectively.

The Central Bank began to liberalize exchange controls in 1994, and delegated additional authority with respect to a range of current transactions to commercial banks. The liberalization is being conducted in phases and at the end of the period under review, the commercial banks were allowed to transfer up to \$5,000 per transaction to facilitate regional trading among the CARICOM countries. Special arrangements were also put in place in respect of Organization of Eastern Caribbean States (OECS). Commercial banks may approve the transfer of funds in respect of all current and capital transactions from Barbados to residents of the OECS in East Caribbean dollars. In 1997, further authority was delegated to commercial banks in respect of current account transactions ranging from \$7,500 to \$250,000. The previous range was \$5,000 to \$250,000 for non-trade flows. However there are restrictions to the purchase of foreign exchange by residents which is mainly to prevent a drainage on the foreign reserves of the country.

There are significant restrictions to the purchase of domestic financial assets by non residents as these purchases must be funded by external funds. There is no parallel market for foreign exchange as the Barbados dollar is pegged to the United States dollar at BD\$2 per US\$1 and this is the accepted rate everywhere.

Barbados became a member of the International Monetary Fund on December 29, 1970 and accepted the obligations under Article VIII, Section 2,3, and 4 of the IMF articles of agreement on November 3, 1993.

The Central Bank periodically obtains forward cover in the international foreign exchange market, to hedge its own or the central government's exchange risks associated with foreign exchange loans that are denominated in US dollars. Commercial banks are also allowed to obtain forward cover in the international markets. The Central Bank and commercial banks enter into swap transactions in US dollars while commercial banks freely switch between non-regional currencies.

All foreign investment must be registered at the Central Bank. When the particular investment is sold or liquidated and the applicant wishes to repatriate the net sale or liquidation proceeds of his or her investment, permission must be granted from the Central Bank. The liquidation of proceeds is permitted, provided that evidence documenting the validity of the remittance is submitted and all liabilities related to the investment have been discharged. This could be the amount of the original investment plus capital gains as calculated as per formula used by Central Bank. Any excess of this amount is allowed as decided by Central Bank.

There are no repatriation requirements for service earnings except in areas where taxes are payable. All service earnings can be repatriated as long as the taxes due have been paid.

Up until 1995, authorised dealers had no authority to approve applications for transfers of profits or dividends and interest payments. In 1995 and 1997, they were allowed to approve these current transfers up to \$100,000 and \$250,000 respectively. At the end of 1998, authorized dealers may approve applications for the transfer of funds in respect of both current and capital transactions, irrespective of limit, from Barbados to the OECS in Eastern Caribbean dollars.

There is no exchange tax but Exchange Control fees were instituted in 1980, on applications for non-trade payments and the transfer of real property. They were however abolished in 1996, as exchange controls became more liberalized.

#### *Monetary Policy Instruments*

The monetary policy instruments index gives an indication of the types and availability of monetary instruments used by the Monetary Authority (Box 6). The results of this index show that Barbados has been largely developed over the period under consideration (Table 1).

The monetary authorities do not impose bank-by-bank credit limits, as credit controls instituted by the Central Bank are set for the banking system as a whole. The re-discounting of commercial bank paper with the Central Bank was introduced in 1973 (Saunders and Wood, 1997). Initially these discounts were mainly for loans to the sugar industry but in the following year it was extended to finance non-sugar agriculture, manufacturing and tourism. When the discount rate was used to effect changes in the money supply a score of zero was used. Central bank loans to commercial banks are used as a monetary policy

instrument and the index follows the same principle as with the discount rate.

#### **Box 6. The Monetary Policy Index**

- Do the monetary authorities impose bank-by-bank credit limits?
- Is the central bank discount rate used as an active monetary policy instrument?
- Are Central bank loans to banks primarily used as a monetary policy instrument?
- Is there a large-value payment system (i.e. a system for rapid clearing of large payment orders)?
- Is the base used to calculate reserves requirements computed from contemporaneous values?
- Does the government obtain resources through market operations, such as auctions?
- Does the central bank conduct open market operations?
- Does the public hold government securities?

There is a large-value payment system in place at the commercial banks as stipulated in the Central Bank Clearings Agreement. Up until November 1981, banks computed the required percentage on deposits outstanding at the close of business on Wednesday of each week. Effective November, 1981, The Central Bank directed banks to compute this requirement on the basis of a three week average of domestic deposits, for the three weeks prior to the reporting date. The required reserve requirement has increased steadily from 3% of deposits in 1973 to 25% in 1998. The public was always allowed to hold government securities.

The Central Bank manages the issue of Government securities. The treasury bill auction is not an auction in the true sense since there is no bidding by banks to affect the interest rate. Similarly, the attempts at open market operations have had limited success since banks and other financial institutions only buy treasury bills when they have excess cash.

#### *Overall Financial Development*

The overall financial development index shows that Barbados was minimally developed up until 1986, but since then may be described as somewhat developed. There was a slight decline in the index in 1980 and

between 1978 and 1982 the index increased by a mere .6 of a percentage point. This period coincided with the second oil shock and recession in the industrialized countries. The index however improved by 9.0% up until 1990, but then declined the following two years (Table 1). The improvement was partially due to the introduction of new financial products and to developments in the market structure of the financial system. The decline corresponded with the stabilization program undertaken by the Government during that time. The index increased by 26.0% since 1992, mainly on account of the liberalization of exchange controls, improvements in the institution environment and the increased number of financial products being introduced as reflected in the financial openness, institutional environment and financial products sub-indices respectively.

#### IV. Conclusion

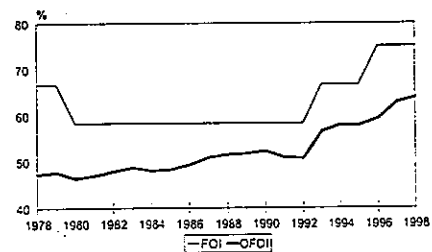
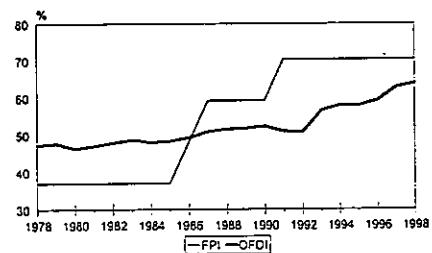
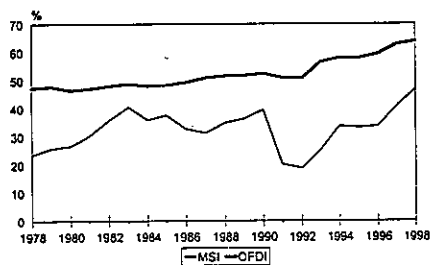
This paper measures the level of financial development in Barbados over the period 1978-1998 from six angles: the structure of the market, the availability of financial products, the stage of financial liberalization, the institutional environment under which the financial system operates, the degree of integration with foreign financial markets, and the sophistication of available monetary policy instruments. The results suggest that progress has been made in improving and modernizing the financial system, especially in the areas of financial products availability and financial openness (Chart 1). However, there is still work to be done particularly in the market structure and financial liberalization segments. These aspects could benefit from further initiatives aimed at completing the reform process, thereby increasing the ability of the system to meet the financial needs of the economy in the future.

**Table 1: The Overall Financial Development Index and its Composition**

Year	Indices						
	MSI	FPI	FLI	IEI	FOI	MPII	OFDI
1978	23.5	37.0	26.2	42.9	66.7	87.5	47.3
1979	25.8	37.0	26.2	42.9	66.7	87.5	47.7
1980	26.6	37.0	26.2	42.9	58.3	87.5	46.4
1981	30.2	37.0	26.2	42.9	58.3	87.5	47.0
1982	35.7	37.0	26.2	42.9	58.3	87.5	47.9
1983	40.5	37.0	26.2	42.9	58.3	87.5	48.7
1984	36.0	37.0	26.2	42.9	58.3	87.5	48.0
1985	37.6	37.0	26.2	42.9	58.3	87.5	48.3
1986	32.7	48.1	26.2	42.9	58.3	87.5	49.3
1987	31.3	59.2	26.2	42.9	58.3	87.5	50.9
1988	34.9	59.2	26.2	42.9	58.3	87.5	51.5
1989	36.3	59.2	26.2	42.9	58.3	87.5	51.7
1990	39.5	59.2	26.2	42.9	58.3	87.5	52.3
1991	20.1	70.3	26.2	42.9	58.3	87.5	50.9
1992	18.7	70.3	26.2	42.9	58.3	87.5	50.7
1993	25.2	70.3	46.2	42.9	66.7	87.5	56.5
1994	33.7	70.3	46.2	42.9	66.7	87.5	57.9
1995	33.2	70.3	46.2	42.9	66.7	87.5	57.8
1996	33.7	70.3	46.2	42.9	75.0	87.5	59.3
1997	40.9	70.3	46.2	57.1	75.0	87.5	62.8
1998	46.8	70.3	46.2	57.1	75.0	87.5	63.8

Note: MSI=Market Structure Index, FPI=Financial Products Index, FLI=Financial Liberalization Index  
 IEI=Institutional Environment Index, FOI=Financial Openness Index,  
 MPII=Monetary Policy Instruments Index, OFDI=Overall Financial Development Index

**Chart 1 The Overall Financial Development Index and Selected Indices**



Note: OFDI = Overall Financial Development Index, MSI = Market Structure Index, FPI = Financial Products Index, FOI = Financial Openness Index

**REFERENCES**

Ficca, V., 2000, "History, Performance and Future of Non-Bank Financial Institutions in Barbados: Mutual Funds, Credit Unions, Mortgage and Trust Companies," mimeograph (Bridgetown: Central Bank of Barbados).

Gilbard E., and Leite S., 1999, "Measuring Financial Development in Sub-Saharan Africa", IMF Working Paper 99/105 (Washington: International Monetary Fund).

La Porta, R., Lopez-de-Filanes, F., Shliefer, A., and Vishny, R.W., 1997, "Legal Determinants of External Finance", *Journal of Finance*, Vol. 52 No.3 (July), pp. 11:31

Levine, R., 1997, "Financial Development and Economic Growth: Views and Agenda", *Journal of Economic Literature*, Vol. 35 (June), pp. 688-726.

Pill, H., and Pradhan, M., 1995, "Financial Indicators and Financial Change in Africa and Asia", IMF Working Paper 95/123 (Washington: International Monetary Fund).

Saunders, M., and Wood, C., 1997, *Chronicle of Central Bank Policy* (Bridgetown: Central Bank of Barbados).

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