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2009

Online at https://mpra.ub.uni-muenchen.de/33439/
MPRA Paper No. 33439, posted 16 Sep 2011 19:58 UTC

The Contribution of Credit Unions to the National Development of Barbados

By

Ronnie Griffith[1], Kimberly Waithe, Troy Lorde and Roland Craigwell

Abstract

Credit unions differ from commercial banks and other financial institutions since their members are the owners of the credit union and they elect board of directors in a democratic one-person-one vote system regardless of the amount of money invested in the credit union. Credit unions contribute to economic development through the wider community, mobilizing significant volumes of savings. They continue to be a major source of growth within the financial sector and therefore their macroeconomic significance has increased considerably. Credit unions have transformed the social and economic status of several members, enabling them to advance from the underprivileged class to the home owner class, by providing affordable terms and conditions for access to loans to finance a wide range of programs. This paper seeks to determine the contribution of credit unions to national development. The DOLS econometrics methodology suggests that the variables of interest that affect economic growth are government capital expenditure, real capital stock and cash of the credit union, the latter indicating that credit unions have a significantly positive effect on national development in Barbados. This conclusion is also complemented by an analysis of five PEARLS ratios which show the significant growth and viability of credit unions.

Key Words: Credit unions**,** economic development, Dynamic OLS, PEARLS ratios

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Introduction

A credit union is a cooperative financial institution that is owned and controlled by its members. It is operated for the purpose of promoting thrift, reasonable credit rates, as well as general financial services to its members. Through the services offered by credit unions also tend to further community development or sustainable development on a local level.

Credit unions differ from banks and other financial institutions since their members are the owners of the credit union. The Board of Directors is elected in a democratic one-person-one-vote system, regardless of the amount of money invested in the credit union. Such a requirement serves as an equalizing device and ensures that possession of superior financial resources does not allow a person to control the credit union or exercise extra-ordinary influence on its direction. In addition, it ensures that elected officials are chosen on the basis of merit rather than money.

Credit unions offer the same financial services as banks but they use a different terminology in some cases for the service. These services include share or savings accounts, credit cards, share term certificates and online banking. Only members of a credit union can deposit or borrow money from it since a credit union provides a broader range of loans and savings products at a cheaper cost than most microfinance institutions. The two largest societies in Barbados, the Barbados Public Workers Cooperative Credit Union (BPWCCU) and the City of Bridgetown cooperative Credit Union (COBCCU) also offer debit cards.

Historically, credit unions render excellent service to members while providing the means for enhancing their financial, economic and social well being, in consonance with co-operative principles. The most significant benefit that credit union growth can bestow upon a community is the development of strategies of self-reliance in dealing with individual, community and national problems (Alleyne, 1984).

The credit union has been a major source of growth within the financial sector of Barbados during the last decade (see Moore, 2000). Consequently, the macroeconomic significance of the credit union movement has increased substantially. The impact of its lending activities upon competitors, the balance of payments and the economy are being more closely monitored as a result of the rapid growth in these institutions (see Belgrave, Craigwell and Moore, 2002).

The purpose of the paper is to identify and record the significant contribution credit unions have made to national development in Barbados. To do this we added some variables that represented the growth in credit unions to a standard growth model for Barbados adopted from Lewis and Craigwell (1998). Then this model is estimated utilizing the Dynamic Ordinary Least Squares (DOLS) methodology which is preferred because it is good for small samples and gives consistent estimates where variables have different orders of integration. Some PEARLS ratios are also examined to test the viability of the major credit unions. The remainder of this paper is organized as follows. Section 2 provides an introduction and a background analysis of the development of credit unions internationally, particularly in Germany, United States of America, Canada and the United Kingdom, as well as in Barbados which is the main focus. Section 3 outlines and reviews the literature on credit unions, while section 4 describes and analyses the Barbados data. Section 5 discusses the empirical results and Section 6 summarizes the main findings.

Background / History

Developed / Developing Countries

According to the World Council of Credit Unions (WOCCU), at the end of 2006 there were 46,377 credit unions in 97 countries around the world. Collectively, they served 172 million retail members and managed US$1.1 trillion in assets, excluding data from the pioneers of credit unionism such as Germany, France, Holland and Italy. Nations with the greatest number of credit union members include the United States (87 million), India (20 million), Canada (11 million), South Korea (4.7 million), Japan and Mexico (3.6 million), Australia (3.5 million), Kenya (3.3 million), Ireland (3.0 million), and Thailand and Brazil (2.6 million). Countries with the highest percentage of members in the economically active population were Dominica (147%), Ireland (110%); Barbados (72%); Trinidad and Tobago (57%); Canada (48%); USA (43%); and Australia (26%).

In 1864, Friedrich Wilhelm Raiffersen founded the first rural credit union in Heddesdorf, Germany. Rural communities in Germany faced a severe shortage of financial institutions. They were viewed as unbankable owing to the size, seasonality of cash flows and very limited human resources. In 1888 Raiffersen died, however by that time credit unions had spread to Italy, France, the Netherlands, England and Austria, among other nations.

The first credit union in North America, the "*Caisse Populaire de Levis"* in Quebec, Canada began operations on January 23, 1901 with a ten cent deposit. It was founded by Alphonse Desjardine, a reporter in the Canadian Parliament. Mr. Desjardine was moved emotionally when he learned that a Montrealer was ordered by the court to pay nearly $5,000.00 in interests on a loan of $150.00 from a moneylender. It was through his desire to help that he developed a unique parish-based model for Quebec, the "*Caisse Populaire."* Canada has the highest per-capita use of credit unions in North America, with more than a third of the population enrolled in one. They are concentrated in Quebec and in the Western Provinces.

On November 24, 1908, the first credit union, St. Mary's Bank Credit Union of Manchester, New Hampshire was founded in the United States. On November 23, 1910, the Industrial Credit Union was established for all people in the greater Boston community. It was the first non-faith-based or community credit union created. Dora Maxwell established hundreds of credit unions and programs for the poor, while Louise McCarren Herring's work to form credit unions and ensure their safe operation earned her the title of *"Mother of Credit Unions"* in the United States.

During 1934, Congress passed the Federal Credit Union Act, permitting credit unions to be organized anywhere in the United States. This legislation allowed credit unions to incorporate under either State or Federal law, a system of dual chartering that persists today.

In the United Kingdom, the Friendly Societies Act was formalized in 1819 to improve the quality of life for ordinary people through the development of co-operatives and mutual societies. This permitted small regular individual contributions to be pooled for mutual collective benefit, obtaining the same economies of scope and scale necessary in providing collective insurance and banking products. The traditional intermediation function of mutual societies was to promote thrift among the working classes and thereby provide access to low cost home loans.

Most credit union members are protected by life savings coverage up to a maximum of BDS$25,000 per member. Loans granted up to BDS$200,000 are covered by loan protection insurance. If the member dies or becomes incapacitated, the loan, as well as all interest charges will be repaid in full. Both the life savings and the loan protection benefits are provided at no extra cost to the member. However, these conditions apply relative to the members' eligibility for such benefits.

Credit unions contribute to economic development by mobilizing significant volumes of savings. Such savings act as a catalyst for both domestic investment and consumption through loans thus stimulating activity throughout the economy. Credit unions increase the volume of financial transactions and allow for the greater accumulation of savings, thereby increasing economic efficiency through the reduction of the cost to borrow or credit. Since loan funds are domestically acquired from their members, credit unions do not increase the international debt burden, as they do not depend on external capital. Furthermore, credit unions are not a drain on scarce national budget resources because they do not depend on government subsidies.

Barbados

Research (see Moore, 2002) has shown that the Credit Union Movement in Barbados began in 1953 when the Shamrock Credit Union started operations. At the end of the first year of operations, March 1954, total assets amounted to a mere $2,776 of which $1,560 represented cash and $1,203 accounted for loans to members. Share capital was $2,132 and a meager surplus of $321.00 was realized. At the end of the first decade of operations, in 1964, the Credit Union Movement had grown to twelve societies with an asset base of $135,330 and a loan portfolio amounting to $86,304. Share capital increased to over $111,000 while undivided surplus which was recorded at just over $4,600 was solidly backed by statutory reserves of $2,830.

During the past twenty-five years i.e. 1978-2003, the Credit Union Movement has grown from an asset base of $1.3 million to $604.9 million; savings (in the form of shares) have increased from just under $1.0 million to $360.1 million and loans from an acceptable $800,000 to $407.3 million.

This remarkable expansion and development of the Credit Union Movement can undoubtedly be attributed to the steady growth and development that occurred within the economy of Barbados during the last twenty-five (25) years. Central Bank restrictions on the commercial banking sector and tax incentives for credit unions led to credit unions' loans, as a percentage of commercial banks' loans, expanding from 0.8% in 1980 to just under 10.0% in 1990 (Moore, 2002). This evidence indicated that incomes and savings have been growing in relation to real growth overtime and that the financial services industry in general and credit unions in particular, have benefited accordingly. In addition, the level of unemployment has declined significantly from a high of 22.5% in 1976 to just over 11% in 2003. As a result, there has been increased savings in credit unions, banks and other financial institutions, particularly by individuals (Fredericks, 2003).

During the 1980s, the total membership of the credit union movement in Barbados grew at a rapid rate. In 1980, total membership was 6,000 members. By 2003 membership had grown to 108,694. At present, membership of the BPWCCU is estimated to be approximately 52,000 individuals. The current membership is estimated at approximately 36.0% of the labour force for 2002. Credit union membership growth rates are even more dramatic, increasing from under 7.0% of the total labour force in 1980 to 68.0% at the end of 2000.

Credit unions' loans, as a percentage of commercial bank loans, expanded from 0.8% in 1980 to just below 10.0% in 1990. The rise in credit unions' share of the lending market continued into the 1990s, albeit at a reduced rate, with total credit unions' loans reaching 11.2% of total commercial banks' loans by the end of 2000 and 32.8% by 2006. This evidence is indicative of the growth of the credit union throughout the last few decades (Belgrave, Craigwell and Moore, 2002). The credit union industry continues to be a major source of growth within the financial sector. As a consequence, the macroeconomic significance of the institution has increased considerably.

Credit unions have transformed the social and economic status of several members, enabling them to advance from the underprivileged class to the home owner class, by providing affordable terms and conditions for access to a wide range of financial products. The primary factors accounting for the robust performance of credit unions since the 1970s were the fiscal concessions afforded to members to increase savings, credit squeezes imposed by the Central Bank on commercial banks, aggressive marketing strategies employed by the larger credit unions, and the emergence of informed committed leadership at the national level.

Assets have also grown substantially since the 1980s when they were valued at more than BDS$6 million dollars. Today, total credit union assets are valued at more than BDS$1.2 billion, and total loans exceed BDS$970 million. Recently, it was recorded in the Sunday Sun Edition of the Nation Newspaper of August, 2009 that the Barbados Public Workers Cooperative Credit Union (BPWCCU) had assets of almost BDS$600 million with net surplus of BDS$ 7.4 million, an improvement on the BDS$ 4.1 million for the 2007-2008 period. Strategies including the reduction of costs and the improvement in earning, along with training at the technical level contributed to the recent success of the BPWCCU.

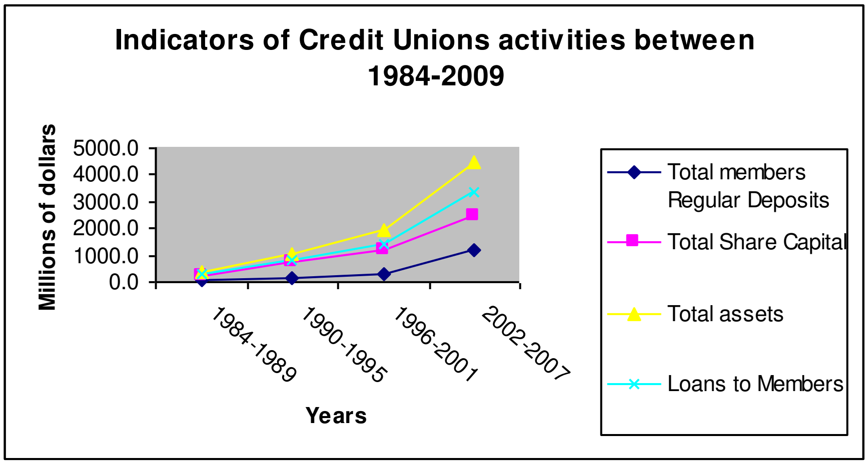
In addition, the BPWCCU has one of the best technology platforms of any financial institution in Barbados. Much was achieved in conjunction with Sure Pay facilities across Barbados to encourage money deposits and loan repayments making access to funds much easier.

In contrast, the Barbados Workers Union Cooperative Credit Union (BWUCCU) registered an increase in loans and savings by seven per cent and three per cent respectively when compared with the previous year. Assets were BDS$ 76 million and membership totaled 13,000 persons at March 2009. The BWUCCU attributed their success to the loyal patronage of its members, and the extent to which they extended their bonds which paid dividends to members, while increasing their marketing efforts.

Table 1: Indicators of credit union activity for all credit unions between 1984-2009

Year	**Total Members Regular Deposits (millions)**	**Total Share Capital (millions)**	**Total Assets (millions)**	**Loans to Members (millions)**
1984-1989	49.0	260.2	370.3	279.0
1990-1995	127.8	722.7	1,076.0	790.4
1996-2001	263.0	1,159.2	1,960.3	1,402.5
2002-2007	1,223.2	2,498.9	4,498.8	3,323.1
2008-2009	1,584.0	320.4	2,386.4	1,852.8

Source: Barbados Co-operative Credit Union League Limited 1984-2009 Annual Reports



Source: Barbados Co-operative Credit Union League Limited 1984-2009 Annual Reports

Literature Review

The literature on this topic is very limited and therefore the discussion in this section is necessarily brief. There are several persons who have examined the services of the credit unions. Others have looked at their growth and their regulation as a result. Credit unions are cooperatives established to provide deposit and loan service needs for persons who share a common bond such as occupation, association or residential location (Black and Dugger, 1981). They are unique financial depository institutions, since they are cooperative financial institutions limited to serving the consumer credit and savings market. Their main goal is to maximize financial services and benefits to members who own the organization (Kane and Hendershott, 1996).

To a large degree, the ability of credit unions to provide member loans, and at the same time generate income for members, explains their continued competitiveness, growth, and existence. Income is therefore generated from interest collected on outstanding loans and from un-loaned capital investments. The maximization of income to shares and a good mix of financial services will attract new members, increase shares and assets, enhance economies of scale and strengthen competitiveness (Jensen and Meckling, 1976; Williamson, 1988).

Nevertheless, there is a large array of literature on the impact of credit unions and the effects of financial services on the livelihood of millions of people, primarily those that live in the rural areas of developing countries. The poor have restricted access to formal financial institutions (Stiglitz and Weiss, 1981; Boucher, 2000; Barham et. al., 1996; Bell et. al., 1997; Carter and Olinto, 1998).

Generally speaking, it is necessary to emphasize that basic access to the services of financial institutions with a view to acquire monetary funds, gives individuals the opportunity to smooth consumption through savings and loans. This allows them to manage negative shocks on their financial capability by either depleting their savings or borrowing to meet their expectations or consumption needs. With regard to the poor and less fortunate, the lack of access to monetary financial assets and services create problems because they tend not to have any savings and are constrained to accessing adequate levels of loans to reduce their ability to smooth necessary, expected and unexpected consumption patterns.

Emmons and Schmid (2000) found that credit union participation rates are higher in more concentrated local deposit markets; such is the case in Barbados. They also found that concentration in deposit markets increases if the country records an increase in the credit union participation rate during the previous year.

With respect to the overall development within a country, Feinberg and Atuar Rahman (2001) present evidence of competitive relationships between banks and credit unions in setting consumer loan rates. They also indicated that as the number of credit unions in a particular country increase, the rates charge by banks on new vehicle consumer loans falls. Therefore they provide necessary competition for banks. The relationship-lending-hypothesis invariably states that a credit union is more likely to engage in business lending if it operates in a market with few community banks. As a result, more opportunities exist to establish relationships with small local businesses.

Williamson (1996) stated that credit unions are affected by their institutional environment and organization governance and the legal structure within which they operate. Whether they compete and/or cooperate is determined by their governance structure, transaction costs, and alternative asset uses.

Hinds and Chase (1977) mentioned that the growth of the credit union movement has attracted the regulatory attention of the Central Bank of Barbados. They asserted that while still endeavouring to meet the needs of the poor, the movement had become very sophisticated offering a range of credit services which competed directly with the established banking sector. Credit unions now offer services such as automatic teller machine facilities, credit cards, mortgage loans, small business loans, chequing facilities, and bill paying services.

Belgrave, Craigwell and Moore, (2002) indicated that credit unions' growth over time exceeded that of both banks and mortgage institutions, especially during the 1980s when a combination of Central Bank restrictions on the Commercial Banking Sector and tax incentives for credit unions led to credit union loans as a proportion of Commercial Bank loans expanding from 0.8 per cent in 1980 to around 10.0 per cent in 1990.

Alleyne (1997) stated that education and training in cooperative principles and the interpretation of financial information for all members of primary and secondary societies is the most important ingredient for healthy growth.

Data

The empirical analysis is based on annual data from 1970-2004. *Linv, lscap, lcash, lrgdp, lrcaps, lintr, lgcexp* and *lloans* are used to represent investment, share capital, cash, real gross domestic product, real capital stock, the interest rate, government capital expenditure and loans to members. All the data were standardized by converting each series into natural logarithms for estimation purposes. The data covered a thirty-four year period and was procured from the Annual Reports of the eight major credit unions[2] and the Statistical Digest of the Credit Union Activity from 1954 to1994 and 1995-2009. The

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[2] The major credit unions on which the research was conducted were BS&T Employees' Co-operative Credit Union Ltd., Barbados Teachers Co-op Credit Union, Barbados Public Workers Co-operative Credit Union Ltd., City of Bridgetown Co-operative Credit Union Ltd., Light & Power Employees Co-operative Credit Union, Barbados Police Co-operative Credit Union Ltd., Public Transport Co-operative Credit Union Ltd., Barbados Workers Union Co-operative Credit Union Ltd.

limitations of the paper was accessing data for effective labour input based on human capital index and the ratio of public to private capital stock used by Lewis and Craigwell in the original study in 1998.

Methodologies

Pearls Ratios

Many of the major credit unions use the PEARLS Financial Standard to measure their performance on an annual basis. The PEARLS Financial Standard is designed to ensure that undue risks are not taken by the financial institutions and that a healthy financial position is maintained at all times. This ensures that all investors are protected, especially those that are vulnerable.

The acronym PEARLS is identified as Protection, Effective Financial Structure, Asset Quality, Rates of Return and Costs, Liquidity and Signs of Growth. The Protection component is measured by comparing the adequacy of the provisions for loan losses against the amount of delinquent loans. It includes loan charge-offs and loan recovery rates. Ratios in the Effective Financial Structures category measure assets, liabilities and capital, and their associated targets constitute an ideal structure for credit unions. The capital ratio that reflects the relationship of capital to assets is used in this paper.

The Asset Quality Ratio measures the impact of assets which do not generate income such as delinquent loans and non-productive assets. Rates of Returns on Costs identify indicators that calculate yields on the basis of actual outstanding investments. The essential components of net earnings are disaggregated to help management calculate investment yields and evaluate operating expenses. This would allow one to determine whether the credit union is earning and paying market rates on its assets, liabilities, and capital.

The Liquidity indicators reveal if the credit union is administering its cash to meet deposit withdrawal requests and liquidity reserve requirements while at the same time minimizing the amount of idle funds. The ideal target is to maintain a minimum of twenty per cent of deposit savings in liquid accounts, after paying all immediate obligations under thirty days. The idle liquid funds ratio should be as close to zero per cent as possible. A sign of sustained growth of institutional capital that exceeds the growth of total assets is a strong indicator of credit union success.

The paper examines five of the ratios found under this methodology (in an amalgamated form) to determine the viability of the major credit unions under investigation. These five ratios show that the major credit unions are highly viable and therefore have the capacity to contribute significantly to national development given the PEARLS Financial Standard criterion. Following are the five ratios that were examined to determine the viability of the major credit unions:

(i) Annual Net Change in Loans / Total Loans of the previous year (see Table 2)

With this liquidity ratio test where the viability of the credit union is determined given a 10.0 per cent minimum rate indicating that the credit unions are adequately able to service the money demands by their members after paying all immediate obligations under thirty days. They were consistently above the minimum rate of 10.0 per cent for all the years except 1994 which may have resulted in a significant fall in the change in total loans relative to those of the previous years. Therefore, it is evident that the major credit unions are in a good position to meet their short-term cash obligations.

(ii) Change in Total Assets / Total Assets of previous year (see Table 2)

Ratio (ii) reflects growth during the period 1995 to 2008 of around 7% or more. In 1995 the ratio indicated a 20% growth of institutional capital, 2003 and 2004 recorded an 18.2% growth and in 2006 there was a 17.4% growth. This suggests that the credit unions are sustaining their growth of institutional capital which led to their success. Contrastingly, in 1994 there was minimal growth of 2.6%.

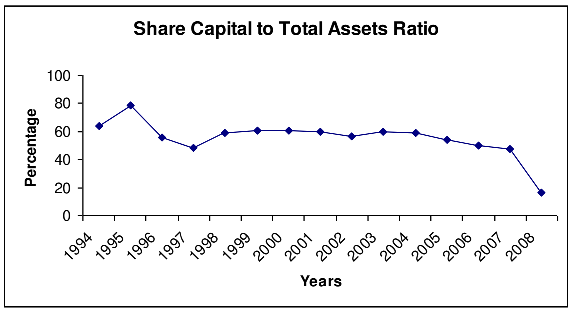
(iii) Share Capital / Total Assets (see Table 2)

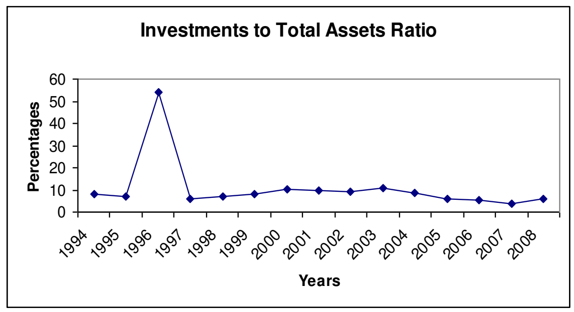
(iv) Loans / Total Assets (see Table 2)

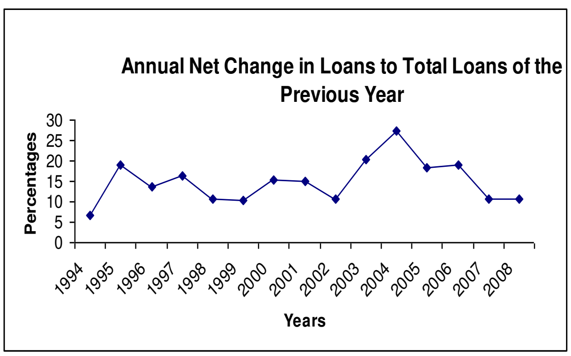
Ratios (iii) and (iv) relate that the effective financial structure of the major credit unions under examination is appropriate given that there are between the range of 60.0 to 80.0 per cent, indicating that there is great potential for growth, earning capacity, and overall financial strength. Loans to Total Assets ratio is consistently around the 70.0 % range until 2004 when it starts to increase to a maximum of 82.2% in 2008. The Share Capital ratio is relatively constant between 1998 and 2004 at around 59.0% and above 47.0% during the period 1994-2007 implying that the major credit unions are able to absorb losses and still be operational, thus having a good protective capacity to deal with any losses. However, in 2008 the share capital to asset ratio drops to around 16.5%, probably due to the current economic and financial crisis which started in the last quarter of 2008, thus severely impacting liquidity and the ability to facilitate increases in share capital and assets.

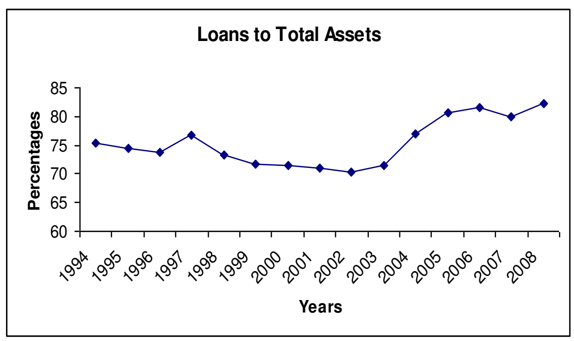
(v) Investments / Total assets (see Table 2)

Ratio (v) Investment to Total Assets indicates that the yield on investment of the major credit unions is somewhat consistent after 1998 and begins to rise after 2007. There is a spike of 54.2% in the ratio in 1996. This may be as a result of the significant rise in the value of investments relative to the value of total assets owned by these credit unions. However, as the total number of assets increases the more the credit unions can invest thus earning a higher percentage yield. Once the yield on investments is increasing then this is an indication that the credit unions are performing creditably.









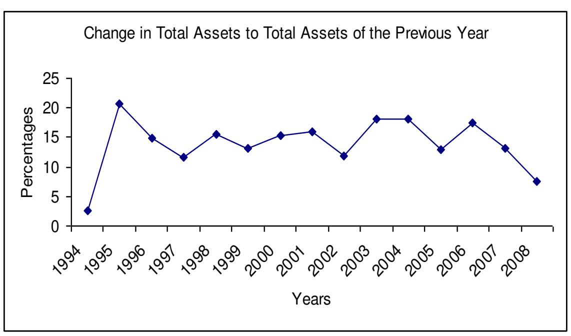


Table 2: Showing ratios as percentages 1994-2008

Year	Share Capital/Assets	Loans/Total Assets	Investment/Total Assets	Annual Net Change in Loans/ Total Loans of the previous year	Change in total assets/total assets of previous year
1994	63.8	75.4	7.9	6.7	2.6
1995	78.4	74.4	7.2	19.0	20.7
1996	55.9	73.7	54.2	13.8	14.9
1997	48.4	76.7	5.9	16.3	11.7
1998	59.3	73.4	7.2	10.6	15.7
1999	60.3	71.6	7.9	10.4	13.2
2000	60.5	71.6	10.5	15.2	15.2
2001	59.7	71.0	10.0	15.0	15.9
2002	56.6	70.3	9.1	10.8	11.9
2003	59.8	71.5	10.8	20.2	18.2
2004	58.8	77.0	8.8	27.2	18.2
2005	54.1	80.6	6.2	18.2	13.0
2006	49.8	81.6	5.3	18.9	17.4
2007	47.2	79.9	4.0	10.8	13.1
2008	16.5	82.2	6.2	10.6	7.6

Econometric Model

This section formally tests the relationship between the growth in national development or gross domestic product and the contribution of credit unions using Dynamic Ordinary Lease Squares (DOLS). The empirical model used as a point of departure is due to Lewis and Craigwell (1998) which is then augmented with some additional variables including those from the credit unions. The DOLS long-run version to be estimated is:

$$(1)\quad lrgdp_t = B' X_t + \sum_{j=-k}^{k} \lambda_j' \Delta X_{t-j}^{i} + \xi_t$$

where *lrgdp* is real gross domestic product, $X = [lloans, \lg c\exp, li\operatorname{int} r, lrcaps, linv, lcash, lscap]$ with *lloans* representing loans to members of credit unions, *lscap* being share capital owned by the members of credit unions, *lgcexp* is government capital expenditure, *linv* is the monetary value of investment made by credit unions, lintr is the interest rate, *rcaps* is real capital stock and *lcash* is cash held by credit unions. THESE SHOULD HAVE BEEN DISCUSSED IN THE DATA SECTION

All these variables are in logs and deflated by retail price index. B_x is a vector of β-coefficients, so that β_y, for example, is the coefficient with respect to *y*. The inclusion of the leads and lags of the first differences of the I(1) regressors take care of serial correlation and endogeneity issues, making the DOLS procedure an unbiased and asymptotically efficient estimator of the long-run relation, even in the presence of endogenous regressors (Saikkonen, 1991; Stock and Watson, 1993). The equation is estimated in most cases with *K=1*, but then a 'general to specific' procedure[3] is applied to reduce the model to a more parsimonious congruent specification where only significant variables are retained. All estimations were done using the econometrics software E-views 5.

In order to investigate the short-run dynamics, the estimates from Equation (1) can be used to formulate a general error correction model (GECM) of the form:
(2)

$$\Delta lrgdp_t = \sum_{j=1}^{p} \varphi_j \Delta lrgdp_{t-j} + \sum_{j=0}^{p} \phi_j^{'} \Delta X_{t-j}^{1} + \sum_{j=o}^{p} \gamma_j^{'} Z_{t-j} + \varsigma_j \sum_{j=1}^{p} \left(lrgdp +_{t-1} - B^{'} X_{t-1}^{*} \right) + \varepsilon_t$$

which specifies changes in real gross domestic product as a function of lagged values of the first difference of the non-stationary variables, stationary variables that may have short-run effects (*Z*), and stationary combinations of the non-stationary variables, which represents the long-run relation between gross domestic product and the forcing variables. This long-run relation among variables is given by the elements of *B* and the rate at which real international reserves respond to disequilibrium in the long-run relation is given by ζ . In estimating Equation (2), a general to specific approach will also be used in order to reduce it to a more parsimonious representation.

[3] See Campos *et al*. (2005) for detailed expositions on the general-to-specific approach to econometric modelling.

Empirical Results and Interpretation

The ADF, PP and KPSS unit root tests (*see Table2*) were carried out on each variable to test the null hypothesis of non-stationarity and stationarity and indicated that all the variables are integrated of order one, meaning they needed to be differenced once to become stationary, except *lgcexp* which was stationary or I (0) in levels when we carried out the ADF unit root test. Given the different order of integration we decided to apply DOLS.

The general to specific search gave the results depicted in *Table 3*. The diagnostic tests for serial correlation, heteroskedasticity, normality, parameter stability and model misspecification revealed that the models are tentatively adequate specifications of the data generation process. The variables of interest in the long-run are government capital expenditure, cash and real capital stock, which reflect injections of the magnitude of 3%, 4% and 19% to a 1% change to *lrgdp*, suggesting that credit unions have a significantly positive long-run effect on national development (real gross domestic product). In the short-run there is a 10% an impact of real capital stock, confirming that credit unions also contribute positively to national development in Barbados in the short run.

Table 2:- Results of Unit Root Tests on variables, 1970-2004

Variables		***ADF***	***PP***	***KPSS***
lscap	Level			0.599 cv[0.740]***
	Δ	-4.735 cv[-3.646]***	-4.778 cv [-3.646]***	
lcash	Level			0.639 cv[0.740]***
	Δ	-7.400 cv[-3.646]***	-7.400 cv[-3.646]***	
lrgdp	Level			0.656 cv[0.740]***
	Δ	-3.456 cv[-2.954]**	-2.972 cv[-2.616]*	
linv	Level			0.638 cv[0.740]***
	Δ	-6.227 cv[-3.646]***	-6.194 cv[-3.646]***	
lloans	Level			0.633 cv[0.740]***
	Δ	-6.923 cv[-3.646]***	-7.318 cv[-3.646]***	
Lrcaps	Levels			0.163 cv[0.347]*
	Δ	-5.593 cv[-3.646]***	-6.209 cv[-3.646]***	
Lintr	Levels			0.375 cv[0.463]**
	Δ	-5.214 cv[-2.616]*	-5.205 cv[-2.616]*	
Lgcexp	Levels	-2.654 cv[-2.616]*	-7.817 cv[-3.639]***	0.669 cv[0.740]***
	Δ			

Notes:*, **, and ***are the Mckinnon critical values (cv) for rejection of the null hypothesis of a unit root at the 10%, 5% and 1% levels respectively for the ADF, PP and the KPSS tests. These tests determine the null hypothesis of stationarity of each variable. A variable is I(0) at Level and I(1) at the first difference of the original series which is denoted by Δ in the table.

Table 3: Estimates for the major credit unions contribution to national development

Long -run estimates	Coefficients	t-statistics
C	4.123 (0.177)	23.239
LGCEXP	0.025 (0.013)	1.987
LRCAPS	0.189 (0.018)	10.791
LCASH	0.038 (0.004)	10.505
Short- run estimates		
C	0.0013 (0.004)	0.310
D(LSCAP)	0.089 (0.004)	2.084
D(LRCAPS)	0.101 (0.019)	5.244
D(LGCEXP(1))	0.057 (0.025)	2.24
D(LCASH(1))	0.017 (0.005)	3.859
D(LINTR(-1))	-0.0270 (0.0113)	-2.386
ECM(-1)	-0.887 (0.423)	-2.096
R^2	0.773	
DW	1.970	
AR	0.724 [0.496]	
RESET	2.703 [0.089]	
NORM	0.480 [0.787]	
ARCH	2.174 [0.152]	
HET	1.860 [0.114]	

Notes: Heteroskedasticity and autocorrelation consistent standard errors are in parentheses and *, **, *** indicates significance at the 10, 5 and 1 percent level, respectively. The F-statistic for the respective diagnostics tests are shown and the associated p-value in square brackets. R^2 is the fraction of the variance of the dependent variable explained by the model. *DW* is the Durbin Watson statistic, *AR* is the Lagrange multiplier test for *p-th* order residual autocorrelation, *RESET* = Ramsey test for functional form mis-specification (square terms only); *Norm* is the test for normality of the residuals based on the Jarque-Bera test statistic (χ^2 (2)). *ARCH* is the autoregressive conditional heteroskedasticity for up to *p*-th order (see Engle, 1982a). *HET* is the unconditional heteroskedasticity test based on the regression of squared residuals on the squared fitted values.

Conclusion / Recommendations

This paper uses DOLS and the PEARLS Ratios to provide empirical evidence on the contribution of credit unions to national development in Barbados over the period 1970 to 2004/2008. The findings suggest that credit unions contribute significantly to national development in the short-run and long-run through their investment in real capital stock (assets), the share capital of members and cash obtained by members through loans.

Quite recently, one of the major credit unions in Barbados engaged in the process of purchasing the cash strap Clico Mortgage and Finance Co. Ltd. in order to preserve the share capital of investors so as to keep the business operational, thus maintaining the current jobs of their employees. This is further evidence of the research findings and the a priori belief that credit unions significantly contribute to national development through investment injections in assets which leads to economic activity.

The results indicated that real capital stock have a significantly positive long-run and short-run effect on national development (gross domestic product) of 19% and 10% respectively. Real capital stock in the long-run is positive and significantly related to development and therefore can be viewed as the accumulation of assets over a period of time. Such injections of capital contribute significantly to national development.

With this in mind, recommendations can be made for Co-operative societies to consider implementing an education programme that systematically exposes new members to the information and skills necessary to enable them to participate effectively in the activities of the credit union movement. In addition, investment in a co-operative Bank can also assist in the contribution to the economic enfranchisement of ordinary Barbadians. With a rapidly growing membership base, the credit union movement took the initiative to invest in an insurance company called the Co-operators General Insurance Co. Ltd. where each member can do business with that institution; since the business of insurance mobilizes the bulk of surplus funds. This investment has further contributed to the success of the credit unions and the development of Barbados.

Consequently, there would be a need for a deposit insurance protection facility incorporated in the regulatory policies governing credit unions to safeguard members' deposits against bankruptcy of a co-operative society. Members therefore need to recognize the risk of loss, and hence seek measures to hedge against possible loss of their share capital. As a result, the League, as the apex body has initiated work on a deposit insurance project that would see credit union members being included in the deposit guarantee facility that is currently only available to the customers of banks, finance companies and trust companies. It is also proposed that there is essential need for a research centre to service the research needs of the co-operative movement in order to provide the necessary information and analysis for effective policy making as it relates to credit, investment and interest rates on loans.

As the paper sought to examine the impact of credit unions on national development it is observed that growth is caused by many factors that interact with each other. Factors such as the availability of easy access to credit, tax incentives and government policy, lower interest rates on loans and better loan repayment terms over a particular time period.

It is therefore necessary that the Government continues to create an enabling environment that gives every encouragement to the membership of the credit union movement to increase its savings so that it can continue to invest, thrive and develop as they instill values of thrift and self-reliance in their membership.

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