



AN EMPIRICAL ANALYSIS OF THE NEXUS BETWEEN PRIVATE SECTOR CREDIT, ECONOMIC GROWTH, GOVERNMENT EXPENDITURE, INTEREST RATE AND INFLATION: CASE OF THE BAHAMAS (1989-2014)

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Abstract

The role of the financial sector in promoting economic growth has been well acknowledged over the years, evidenced by the voluminous research relating to the relationship between credit and economic growth. However, the purpose of this study is to explore the causal relationship between economic growth, Government expenditure, and private sector credit, given that for the Bahamian economy, historical trends revealed that periods of either economic boom or downturn are mirrored by changes in credit. To test the relationship between the variables, the study employs the Ordinary Least Squares (OLS) method, Johansen co-integration test and Granger Causality test. The findings reveal that economic growth and Government expenditure have a positive and significant effect on credit to the economy. The results imply that for The Bahamas, an expansion in the economy is accompanied by growth in private sector credit, thus contributing to more robust economic development. Further, in terms of the positive relationship with Government expenditure, the findings signal that personal emoluments, which account for in excess of 40% of current spending, impacts people's ability to access credit in the economy. The study also showed that there is a long run co-integrating relationship between private sector credit and the exogenous variables. In addition, the Granger Causality test revealed that both economic growth and Government expenditure causes credit to the private sector. Moreover, the study revealed that private sector credit in The Bahamas is "demand following" rather than "supply leading".

Keywords: private sector credit, economic growth, inflation, interest rates

JEL Classification: O47, E51, C32

SECTION I: INTRODUCTION

Economic growth is a key objective of macroeconomic policy. However, the financial sector is crucial in the achievement of this goal, since bank credit is considered a vital means of elevating standards of living, as well as achieving economic development. One of the main conclusions of modern economics is that finance is beneficial to growth. As a result, research on the finance-growth nexus has expanded steadily over the last two (2) decades. Prior studies tended to focus on the relationship between economic growth and private sector credit. However, little attention has been given to assessing the causal linkages between credit and economic growth. Banks are a primary source for accessing finance, in that, they channel funds from entities with surplus liquidity to those lacking these resources, thereby facilitating capital formation and trade. According to a number of studies, countries with efficient credit systems grow faster than those with inefficient methods. Further, Mishkin (2007) noted that better functioning credit systems alleviate the external financing constraints that impede credit expansion, and the growth of firms and industries. Thus, bank credit has a significant role to play in economic growth, especially in developing countries, as it stimulates the economy.

Bank credit, indeed contributes to economic expansion, in that it is an important link in money transmission; it finances production, consumption and capital formation, which in turn affects economic activity. However, the reverse is also applicable, in that as the economy grows, the incentive to borrow and the ability to repay heightens, given positive developments with regard to consumer demand and employment. In the case of The Bahamas, a small open economy, which is heavily dependent on the services sector—tourism related industry represents in excess of 40% of Gross Domestic Product and employs, directly and indirectly, over half of the workforce—it has been evident that during periods of economic growth, private sector credit expands, while during periods of economic downturn credit growth either slows or contracts.

Therefore, given the importance of credit to economic development and vice versa, the objective of this paper is to investigate the causal relationship between private sector credit and economic growth in the context of the Bahamian economy. For a number of years, credit to the private sector, which is considered more efficient at supporting economic growth rather than credit to the Government, has accounted for the largest segment of banking sector credit in The Bahamas. In this regard, the concentration of the study is to examine the impact that changes in selected exogenous variables, such as GDP, Government expenditure, interest rates and inflation, have on trends in private sector credit. In addition, the study seeks

to determine if the relationship between private sector credit and economic growth is “demand following” or “supply leading”. The study spans the period 1989 to 2014. The rest of the paper is structured as follows; the second section reviews related literatures, while the third section analyses the trend and decomposition of private sector credit. The fourth section presents the data, methodology and empirical results of the study. The last section, which presents a summary of the findings, concludes the study.

SECTION 2: LITERATURE REVIEW

In analyzing the dynamic relationship between commercial bank credit and economic growth, two main schools of thoughts are used. One focuses on whether the relationship is “demand following”, while the other examines if it is “supply led”. According to some theories the link is a causal one, but determining how the impact works and the varying factors, all depend on the type of economy and its financial structure.

Ramlogan and Mitchell-Ryan (2010) postulated that for Trinidad & Tobago the relationship between economic growth and bank credit is one that is “demand following”, meaning that as the real sector exhibits growth, the demand for financial instruments will stimulate the financial sector. However, when examining particular sectors, the authors discovered that the relationship was not demand following for all sectors. Select sectors like construction were “supply leading”, which implied that more bank credit will lead to higher output in this instance. The “supply leading” hypothesis explains that the financial sector, through the use of its various instruments, act as an impetus for production, which suggests that developed countries, with far superior financial systems, will experience more financial growth than developing nations. Therefore, the authors agreed that in order to diversify the Trinidadian economy, the use of credit should be employed in industries that are supply-leading, in order to influence economic growth. Nevertheless, Islam et al., (2004) hypothesized that developing countries with their unique socio-economic, political, and institutional history will have a reverse causality from developed nations in relation to finance and growth.

Further, Ndlovu (2013), using a multivariate granger causality and co-integration test, discovered a demand following relationship in the Zimbabwean case, where economic growth lends itself to increased financial expansion. Through the use of five main variables and three control variables, Ndlovu (2013) found that “big” Government can be a hindrance to economic growth and thus states must find a way to both protect their indigenous interests without adversely impacting growth. The author also suggested trade liberalization and job creation to spur economic activity, which would then lead to the development of the financial sector.

In addition, Guo and Stepanyan (2011) noted that in emerging market economies (EME), the relationship between credit and economic growth is more supply led. As the financial markets in these economies grow, the demand for credit expands. Through a series of economic robustness tests, the researchers explained that healthy financial sectors disburse more credit, resulting in elevated economic growth. The authors used a regression analysis to determine credit growth in pre-and post-recession periods in a series of EMEs around the globe. Their analysis revealed that European EMEs often utilized more foreign capital than other EMEs, causing instability in credit growth during recessionary periods. In addition, they found that economies too reliant on foreign capital for their main source of credit are more vulnerable to boom and bust cycles. As a result, macroprudential policies should be employed to counteract such weakness.

Mikhail Stolbov (2015) also conducted a comparable study focusing on the causality between domestic private credit to GDP and real GDP per capita growth within 24 OECD countries during 1989-2013. Employing the unit root tests, standard Granger causality tests and a fully modified ordinary least squares method, the author found that for developed nations of the OECD, there are no widespread causal linkages between credit depth and economic growth. For the countries that did exhibit a relationship, he found that relationship to be more supply led. As a result, the author discourages policymakers from heavy reliance on “bank-based financial development” as a singular force in economic growth, since the study determined that there is no correlation between the depth of one’s financial institutions and economic growth.

In another perspective, Abubakar and Gani (2013), using a co-integration Vector Error Correction Model (VECM), examined how credit affects economic growth in the long run in the Nigerian economy. The study revealed that excessive Government borrowing, coupled with high interest rates caused a crowding out effect on private sector investment and negatively impacted economic growth. According to the authors, other financial instruments, along with trade openness, positively impacted economic growth. The economists summarized the relationship to be supply led and concluded that an expansion of the banking sector would better facilitate private investment.

Similarly, Neelam Timsina (2014) conducted a study on bank credit within the Nepalese economy, employing the use of the Johansen co-integration and the Error Correction Model. The model examined bank credit to the private sector, economic growth, government expenditure and the interest rate to test for both a short-run and long-run relationship. It was determined that for Nepal, the relationship between private sector credit and economic growth is supply led. In the long-run, the effects are more positive, as

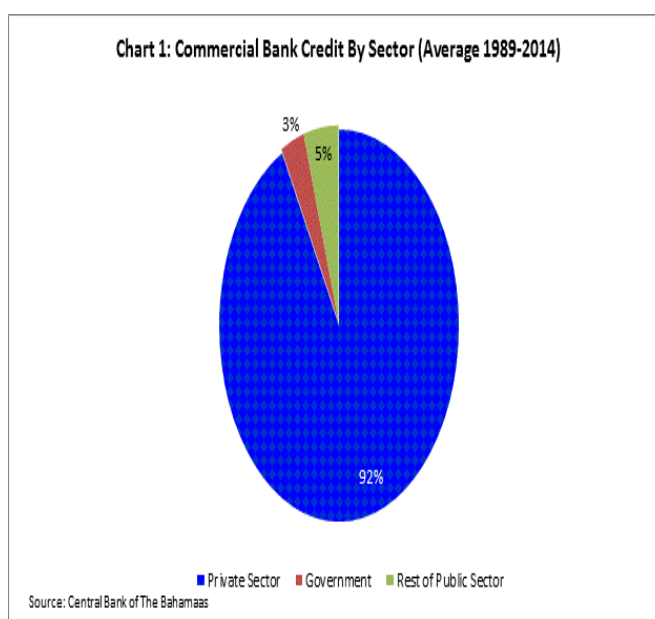
growth in real private sector credit led to growth in real GDP. However, in the short-run, a “demand-following” phenomenon is exhibited, where the feedback effects of GDP growth spur private sector lending.

Specific to Trinidad and Nigeria, based on the studies reviewed, it is evident that even with the demand following relationship in these developing nations, both financial systems have advanced in line with like-sized emerging market economies. However, reform in the financial sectors is essential for further development. In the Zimbabwean case, the demand following relationship of economic growth to financial development has shown that, because of political uncertainty and under-development, the financial sector has seen little progress. Guo and Stepanyan (2011) found that EMEs grew at a faster pace because the supply of financial instruments was fully utilized, leading to economic growth. Whether demand following, or supply leading, the literature has shown that a multitude of factors have to be considered when determining the role credit plays in economic growth.

SECTION 3: ANALYSIS OF CREDIT TO THE PRIVATE SECTOR: THE BAHAMAS

For The Bahamas, private sector credit is the largest component of bank lending, accounting for an average 92.2% per annum of total credit, over the period 1989-2014. Over the same period, the other components, namely public corporations and Government credit, contributed an average 4.6% and 3.2% of total banking system credit, respectively (see Chart 1).

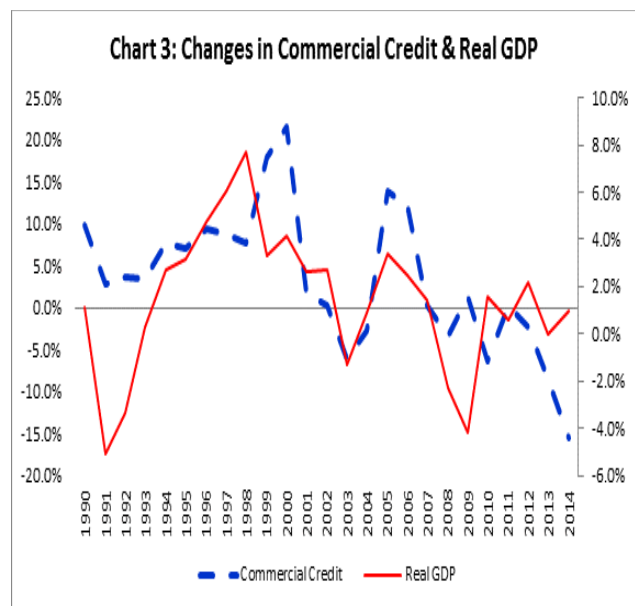
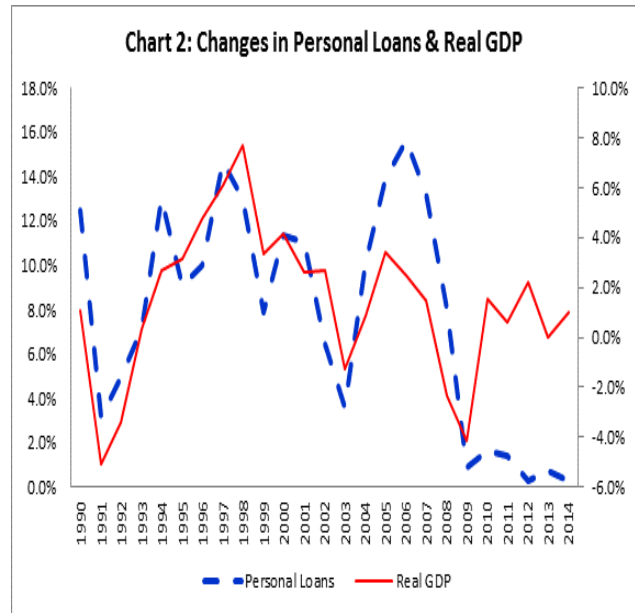
Representing the dominant share, private sector credit is further disaggregated into personal and commercial loans, of which the latter is decomposed into agriculture, fisheries, mining & quarrying, manufacturing, distribution, tourism, entertainment & catering, transport, construction, private financial institutions, professional & other services and miscellaneous credit. Moreover, the choice of the credit arrangement is dependent on the purpose of the credit and the nature of the transaction, as well as the repayment capacity and the source of payment.



Personal loans, which comprise of residential mortgages, consumer loans and personal overdrafts, represented the bulk of private sector credit, with an annual average share of 72.6% of the total. Personal lending increased by 7.6% per annum, over the review years and amassed an annual average value of \$2.9 billion. Moreover, commercial credit, which comprised an annual average 27.4% of private sector credit, grew by 3.5% per annum over the 1989-2014 periods, with an annual average value of \$1.1 billion. Further examination showed that over the review years, both personal and commercial lending was influenced by the domestic economic climate. In periods of economic expansion, credit grew, while in instances of contractions, credit either slows or declines. As depicted in Charts 2 and 3, changes in both personal lending and commercial loans move in tandem with the cyclical changes in GDP.

3.1 Sectoral Decomposition of Personal Loans

A disaggregation of personal loans revealed that residential mortgages commanded the largest share at an annual average of 47.5%, valued at \$1.5 billion over the last 25 years. Evidence showed that during periods of economic downturn the growth in residential mortgages slowed and expanded in boom periods. For instance, in 2006 residential mortgages grew by 16.3%, with a corresponding 2.5% expansion in real output. However, when economic growth tapered to 1.5% in 2007, the build-up in residential mortgages moderated to 13.7%, and slowed further to 11.3% and 4.8%, as GDP contracted by 2.3% and 4.2% in 2008 and 2009, respectively—the height of the recession.



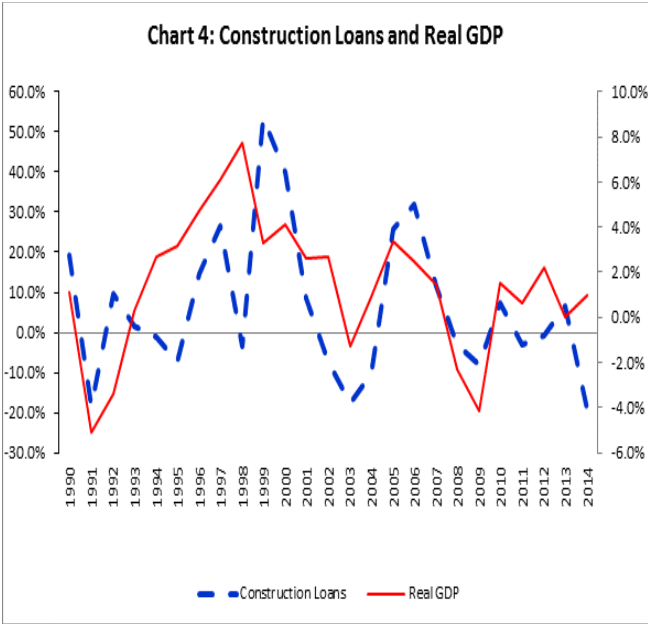
Consumer credit, at an average 43.9% of total personal lending, valued at \$1.4 billion per annum, exhibited similar cyclical patterns as the residential segment. In 2006, after posting a gain of 14.5%, in line with a 2.5% strengthening in GDP, the growth in consumer loans tapered to 10.8%, as real output waned to 1.5% in 2007. With the continued weakening in economic activity during the peak of the recession, the rise in consumer lending slowed to 6.5% in 2008, before declining by 2.3% in 2009. Further, with the recovery remaining subdued, consumer credit grew by a modest 2.3% in 2014, following economic growth of a mere 1.0%.

Likewise, personal overdrafts, which represented the remaining 8.6% per annum, valued at an annual estimated \$1.0 million, displayed similar trends in 2008 and 2009, reducing by 16.2% and 20.2% at the peak of the recession. Developments in the overdraft component remained weak, falling by 7.2% in 2014, as economic growth remained subdued.

3.2 Sectoral Decomposition of Commercial Credit

In terms of the sectoral decomposition of commercial credit, loans for construction purposes basically involve the development of land for commercial, industrial or residential purposes. It comprises lending to businesses engaged in building homes for residential purposes, for renting or sale. For the years under review, the construction category constitutes the bulk of commercial lending, with an average annual share of 25.1%, valued at \$277.6 million per annum. Indications are that borrowing for commercial construction registered significant decreases during the recessionary phase of the business cycle, in line with the expected slowdown in activity.

As depicted in Chart 4, during periods of economic recession, construction credit declined and vice versa in times of boom. For example, in 1991, when real output contracted by 5.1%—the highest in 25 years—construction loans for commercial purposes decreased by 18.2%. Similar trends were observed in 2003, 2008 and 2009, when real GDP declined by 1.3%, 2.3% and 4.2%, respectively, and lending to the

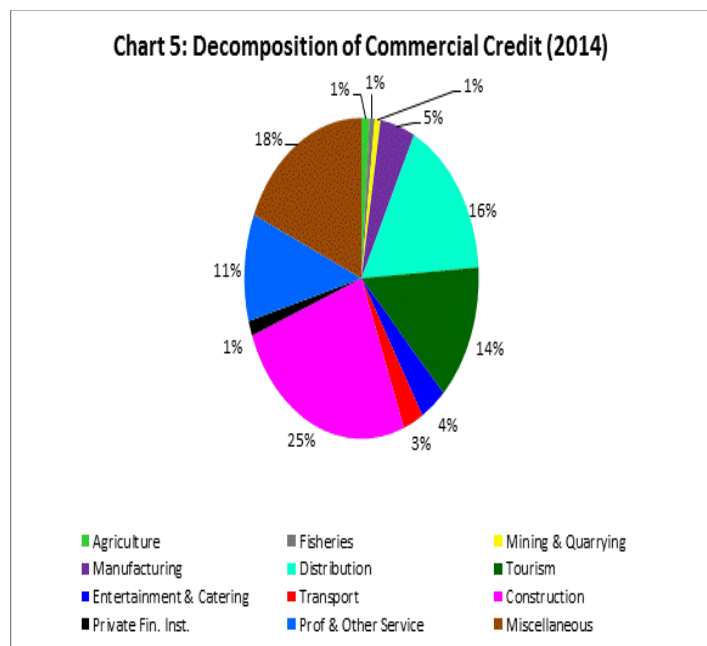


commercial sector was reduced by 17.7%, 3.1% and 8.2%. Further, given the mildness in economic activity in 2014, domestic construction developments remained subdued, with construction loans falling by 19.3% at the end of the year.

With regard to the other components, distribution credit accounted for on average 16.5% per year of total commercial lending, valued at an average \$182.9 million. The distribution sector comprise loans and overdrafts to companies or individuals engaged primarily in the import and export of goods or in the local distribution of goods by commission agents, wholesalers, retailers and other distributors. A more detailed analysis of lending for distribution commitments revealed that, similar to the construction segment, during times of economic downturn there is a falloff in loans extended to this sector. For example, in 2008 at the start of the global recession, distribution loans fell by 8.6%, following a 2.3% contraction in the domestic economy, and as the recession heightened in 2009, borrowing for distribution decreased by 17.2%, as the shrinkage in the domestic economy deepened to 4.2%.

The miscellaneous category represented, on average, 18.5% of total commercial lending, while registering a value of \$204.0 million per annum. This category consists of any lending which cannot fit in the various designated economic and financial sectors. Other components with double digit shares were tourism, with 13.8% and professional & other services with 10.8%, with corresponding values of an annual average of \$152.3 million and \$119.3 million, respectively. Specifically to commercial tourism loans, evidence suggested that credit to this sector responds to the business cycle, as during an economic downturn, lending decreases, whereas during an economic boom, credit expands.

The remaining 15.3% of commercial lending was shared among manufacturing (4.8%), followed by entertainment & catering (3.6%), transport (2.8%), private financial institutions (1.5%),



agriculture (1.1%), mining & quarrying (0.8%) and fisheries (0.7%) (see Chart 5). Combined, these sectors accounted for an annual average of \$169.4 billion of commercial credit over the 1989-2014 period.

SECTION 4: EMPIRICAL ANALYSIS OF CREDIT-ECONOMIC GROWTH RELATIONSHIP

4.1 Theoretical Framework

According to the Harrod-Domar growth model, aggregate demand and supply would be in balance when investment (I_t) in any period equals the change in national income ($Y_t - Y_{t-1}$) times the capital-to-output ratio (k). The capital-to-output ratio indicates the value of capital needed to produce one unit of output in a single time period. In a closed economy, the equilibrium state occurs when the intended investment would equal planned savings (S_t).

$$I_t = S_t = k(Y_t - Y_{t-1}) \quad (1)$$

Divide by Y_t

$$I_t/Y_t = S_t/Y_t = (Y_t - Y_{t-1})/Y_t \quad (2)$$

Define:

$$\text{Savings rate} \Rightarrow S = S_t/Y_t \quad (3)$$

$$\text{Growth rate} \Rightarrow g = (Y_t - Y_{t-1})/Y_t \quad (4)$$

Therefore, Harrod-Domar growth equation:

$$s = k \times g \quad \text{or} \quad g = s/k \quad (5)$$

Importantly, the rate of growth is determined conjointly by the national savings ratio and national capital-to-output ratio. Therefore, it appears that the more a nation can save and invest, the faster its potential for expansion. Hence, savings might be less effective in stimulating economic development if financial institutions fail to ensure the efficient allocation of domestic credit. Thus, it can be summarized that savings functions effectively when it is efficiently transformed into domestic credit within a sound financial system. Therefore, given the voluminous research relating to credit, more so private sector credit, and economic

development, it is prudent to examine, in the context of the Bahamian economy, the causal relationship between these, and other selected variables.

4.2 Data and Methodology

Empirical evidence seeks to justify the truth or falsity of a claim, therefore, the objective of this study is to prove that changes in private sector credit are dependent on economic growth, Government expenditure, interest rate and inflation rate in The Bahamas. The study draws on the Johansen's (1988, 1991, 1995) approach to co-integration analysis, which suggests that there is a long-run relationship linking credit to GDP and interest rate, once real property prices are factored in (Hofmann, 2001). This section of the study seeks to validate the *a priori* expectations of the variables by determining the causal relationship between the dependent (private sector credit) and independent variables, employing a series of tests including the Wald test, unit root test for stationarity, co-integration and Granger causality test.

In The Bahamas, credit is disbursed to both the public and private sectors of the economy. Nevertheless, the dominant private sector is viewed to be more effective in stimulating economic expansion. For instance, numerous authors have suggested that bank credit to the private sector is more significant for economic activities, than credit to the public sector. The focus, therefore, will be on private sector credit and the positive/inverse relationship with key variables.

Secondary data, compiled in the Central Bank's Quarterly Statistical Digest, which captured commercial bank credit to the private sector for the period 1989 to 2014, are used in the study. It is expected that credit growth is positively impacted by expansions in nominal GDP and Government expenditure. Further, according to economic theory, there is an inverse relationship between credit, interest and inflation rates, hence the expected negative signs. Commercial bank credit to the private sector (PRIV) is used as the endogenous (dependent) variable, since the study seeks to assess the relationship between private sector credit and economic growth. Exogenous variables such as economic growth (nominal GDP), Government expenditure (GOVEXP), Bank rate¹ (IR) and the inflation rate (INFL) are used in the model. All variables are in the logarithm form (see Equation 5 and Appendix Table 1).

¹This refers to the Central Bank's discount rate, which affects the commercial banks' Prime rate.

$$LNPRIV = \alpha + \beta_1 LNNGDP + \beta_2 LNGOVEXP - \beta_3 LNIR - \beta_4 LNINFL \quad (5)$$

4.3: Ordinary Least Squares Estimation of the Model

Empirical work conducted by various researchers in the field was taken into consideration in attempting to explain the relationship between commercial bank credit and economic growth in The Bahamas. Using the ordinary least squares (OLS) model, all of the variables, except inflation, appear to be statistically significant based on the probability values. The test indicates that at the threshold of 1%, 5%, and 10% level of significance, nominal GDP and Government expenditure have a positive statistically significant impact on private sector credit, because the calculated probability value equals 0.000. Further, interest rate has an inverse relationship with credit (see Equation 4) and is statistically significant at the 10% level. The coefficient of determination (R^2), at 0.99165, suggests that around 99.2% of the variations in private sector credit (LNPRIV) can be explained by the variables in the model. This indicates that the model is a very good fit, since only approximately 0.8% variation in credit is left unaccounted for by the model. The Durbin-Watson statistic of 1.2238 is within the bounds of non-autocorrelation, with the value greater than the R-square. The F-statistic at 623.7089 is significant at the 1%, 5%, and 10% levels, since the calculated probability (F-statistics) equals 0.000. As such, the null hypothesis that all the explanatory variables introduced in the model are not collectively significant in explaining the variations in bank credit is rejected and concludes that they are simultaneously significant.

The study finds that economic growth and Government expenditure play an important role in the behavior of private sector credit in The Bahamas. The results indicate that a 1.0% rise in economic growth and Government expenditure contributed to respective gains of 0.71% and 0.56% in private sector credit (see Equation 6), *ceteris paribus*. As such, economic growth and Government expenditure have a significant impact upon credit accumulation in both the short and long run. The findings therefore suggest that, as the economy expands, so would private sector credit, thus spurring faster economic expansion. With regard to Government expenditure, the finding is in keeping with the theory that personal emoluments, which accounts for in excess of 40% of current outlays, impacts individuals' ability to access credit in the economy—as wages and salaries increase, more persons have the potential to qualify for loans and their ability to repay heightens.

In addition, the results revealed that a rise in the interest rate decreases the demand for credit and vice versa. Specifically, an increase in the interest rate by one percentage point will lead to a decrease in private sector credit by 0.75% (see Equation 6). The findings are in keeping with general economic theory, whereby as interest rates increase the cost of borrowing becomes more expensive, which reduces the demand for credit. Conversely, as lending rates decline, it becomes cheaper to borrow, thereby leading to a rise in credit demand.

$$LNPRIV = 0.7125 \times LNNGDP + 0.5679 \times LNGOVEXP - 0.7501 \times LNIR + 0.0658 \times LNINFL - 1.3923 \times CONST$$

(6)

(0.00)	(0.00)	(0.090)	(0.192)	(0.157)
R ² = 0.99165	Adj. R ² = 0.99006	F-Stat = 623.7089	DW = 1.2238	

However, the inflation rate variable did not exhibit the *a priori* expected sign and was insignificant. The result perhaps was due to the fact that in excess of 80% of the country's goods and services consumed are imported—mainly from the United States. Thus, the dichotomy of having a fixed exchange rate regime and high dependence on imports is an important factor in the outturn with respect to the inflation results. The Bahamas maintained the status of being a price-taker, and as such, is unable to exert any influence on the international market. As a result, inflation in The Bahamas is generally imported.

4.4 The Wald Tests

The Wald test, which is a way of testing the significance of particular explanatory variables in a statistical model, was conducted on the inflation rate variable, since the initial results from the OLS model determined that it was insignificant. The Wald test probability value (0.173) was not significant; indicating that the parameter associated with this variable is zero. Hence, the Wald test results were in keeping with the OLS regression results (see Equation 6), which showed that this variable was not significant and did not have the *a priori* expected sign. However, when the variable was omitted from the regression the adjusted R² value declined signaling that the inflation variable did contribute to the explanatory power of the model.

4.5 Unit Root Tests

Using the unit root test, properties of the single series are checked for stationary. According to the calculated Augmented Dickey-Fuller (ADF) test results, most of the series are non-stationary in the levels—

not integrated of order zero—since the calculated values of the test statistic is higher than the critical value. An analysis of the LNPRIV variable showed that it was integrated of order two (2), that is I(2); however, when the data was segmented into the pre and post recessionary periods, it was noted that the longer pre-recession period was I(1), while most of the test accepted the null hypothesis of stationarity at the second difference for the post-recession period. Nonetheless, for the purpose of the study the variable was assumed to be I(1) for the entire sample period. A separate Phillip-Perron test also indicated that the LNPRIV variable could be considered stationary at the first difference. Given this conclusion, tests for co-integration among the series in the regression were therefore conducted to see if an equilibrium relationship exists among the series. The ADF tests results, presented for variables with intercept and trend, are shown below in Table 1.

Variables	Levels		1st Difference	
	Intercept	Intercept & Trend	Intercept	Intercept & Trend
LNPRIV	-2.8982	0.0248	-1.6804	-1.4205
LNNNGDP	-2.1144	-1.7324	-1.9292	-1.6602
LNGOVEXP	-1.1828	-1.2328	-1.2524	-0.7556
LNIR	-0.4265	-2.5875	-0.2672	-2.6643
LNINFL	-3.2173	-3.3441	-2.8158	-2.3459

95% critical value for ADF = -3.0819 include intercept and -3.7612 with intercept and trend

4.6 Co-integration Tests

Testing for co-integration is necessary because it helps to determine if empirically meaningful relationships are being modelled. In this study, the co-integration test was conducted to deduce whether the group of non-stationary series—bank credit, economic growth, Government expenditure, interest rate and inflation—has a long term relationship. Based on the calculated CRDF statistics, the series are co-integrated, since the calculated value of the test statistic is -2.0968, which is higher than the critical value of -5.4219. The maximum values of the AIC HQC and SBC are 22.9825, 22.9863 and 22.6285, all associated with CRDF (see Appendix Table 2). Thus, the results imply that there is a long-run relationship between the variables. It infers that the residuals are I(0) and the series LPRIV, LNNNGDP, LNGOVEXP, LNIR and LNINFL are co-integrated.

Further, using the trace test at the 0.05 level, the null hypothesis of zero co-integrating vectors ($r = 0$) is rejected, since the test statistic of 84.6991 is greater than the 95% critical value of 39.8100 (84.6991 > 39.8100). The null hypothesis of at most one co-integrating vector is also rejected, but the null of not more than three co-integrating vectors was accepted because the test statistics value of 0.62901 is less than both the 95% critical value of 4.1600 and the 90% critical value of 3.0400. Further, the AIC, SBC and HQC results suggest three co-integrating vectors (see Appendix Table 3).

4.5 Granger Causality Tests

In an attempt to investigate the causal relationship between private sector credit and the exogenous variables, the granger causality test was employed. The test revealed that at the 5.0% level of significance changes in GDP and Government expenditure do cause changes in private sector credit, without any feedback loop (see Appendix Table 4). In terms of no feedback loop, this is perhaps due to the economic dynamics of the country. In the case of Government spending, it can be assumed that this is in direct relation to Government's expenditure on personal emoluments, since Government employs approximately 30% of the labour force and these persons are considered to be less risky borrowers—based on assumption of job security.

Further, The Bahamas is heavily dependent on the services sector, with the tourism related industry accounting for in excess of an estimated 40% of GDP. The tourism sector also employs—directly and indirectly—over half of the workforce. Therefore, once there is a boom in the tourism sector it will translate into low unemployment and buoyant economic activity. The improved labour market conditions will result in more qualified borrowers and hence an expansion in private sector credit. The reverse is also true, that a contraction in the tourism sector will negatively impact economic growth, given an elevation in unemployment, with a corresponding falloff in private sector credit. Thus, it has been observed that for the Bahamian economy, during periods of economic boom, there is heightened credit growth, which provides further impetus to GDP.

Therefore, the Granger causality test results confirm that the relationship between economic growth and private sector credit is “demand following” instead of “supply leading”, whereby economic conditions provide the stimulus for credit expansion. In this “demand following” relationship, as the real sector grows (tourism, employment, GDP) the demand for financial instruments will stimulate the financial sector.

SECTION 5: CONCLUSION

Over the years, empirical studies have delved into how access to bank credit has impacted economic growth. However, the focus of this paper was to empirically investigate whether economic performance, Government expenditure, interest rate and inflation fuels private sector credit in The Bahamas—“demand following” or “supply leading”. Applying the Ordinary Least Squares method, the model showed that economic growth and Government expenditures have a positive and significant impact on private sector credit, which was consistent with business cycle trends observed in the Bahamian economy. The study also revealed that there is an inverse and significant relationship between interest rate and credit expansion, which was in line with general economic theory, whereby, *ceteris paribus*, as the cost of borrowing rises, the demand for credit declines, and vice versa. However, inflation did not have the *a priori* expected sign and was insignificant, which was in keeping with The Bahamas’ import-dependency status—in excess of 80% of what is consumed is imported mainly from the United States.

Further, according to the co-integration test, there exists a stable long-run relationship between economic growth, Government spending, interest rate and credit. In addition, the study determines that GDP and Government expenditure granger causes private sector credit in The Bahamas. The dynamics is that economic growth leads to improved labour market conditions, which then positively impacts credit expansion, thereby encouraging more buoyant economic growth—reflective of a “demand following” relationship.

Therefore, the findings imply that for the Bahamian economy—of which the banking sector is the main source of credit and remains a key channel of financial intermediation through which financial resources can be mobilized for productive investment—the relationship between growth and credit is “demand following”. As a result, the Government needs to continue to promote the tourism sector and attract lucrative foreign investment projects that would serve to propel economic expansion, and thereby translate into employment and engineer credit growth. In general, it can be concluded that, given the type of economy and the financial structure of the Bahamian economy, there is a “demand following”, rather than “supply leading”, relationship between private sector credit and economic growth, whereby as the real sector grows, it provides the impetus for increased credit expansion.

APPENDIX

Table 1: Ordinary Least Squares Estimator Model	
Private Sector Credit = Dependent Variable	
Variables (Exogenous)	Expected Signs
Nominal GDP (LNNGDP)	(+)
Government Expenditure (LNGOVEXP)	(+)
Bank Rate (LNIR)	(-)
Inflation (LNINFL)	(-)

Table 2: Results of Co-integration Tests				
Variables	T-Statistics	AIC	HQC	SBC
DF	-2.0968	22.9825	22.9863	22.6285
ADF(1)	-1.7902	22.0042	22.0117	21.2961
ADF (2)	-1.7598	21.2058	21.2171	20.1437
ADF(3)	-1.9008	20.6996	20.7146	19.2835
ADF(4)	-2.3056	20.7750	20.7939	19.0049
ADF(5)	-1.4055	20.1712	20.1938	19.0470
ADF(6)	-1.6242	19.8592	19.8856	17.3810
ADF(7)	-1.4898	18.9754	19.0056	16.1432
ADF(8)	-2.0644	19.9545	19.9885	16.7683
ADF(9)	-1.7744	19.2785	19.3162	15.7383
ADF(10)	-1.8276	19.2777	19.3192	15.3834

95% critical value for DF statistics = -5.4219

Table 3: Results of Co-integration Trace Tests				
Hypothesis		T-Statistics	Critical Value	
Null	Alternative	T-Statistics	95%	90%
$r = 0$	$r \geq 1$	84.6991	38.8100	36.6900
$r \leq 1$	$r \geq 2$	47.2568	24.0500	21.4600
$r \leq 2$	$r \geq 3$	20.0670	12.3600	10.2500
$r \leq 3$	$r \leq 4$	0.61901	4.1600	3.0400

Order of VAR = 3

Table 4: Results of Granger Causality Tests		
Null Hypothesis	F-Statistics	P-Value
LNNNGDP does not Granger cause LNPRIV	10.8604	0.0181
LNPRIV does not Granger cause LNNNGDP	1.43470	0.3823
LNGOVEXP does not Granger cause LNPRIV	9.10355	0.0249
LNPRIV does not Granger cause LNGOVEXP	0.84806	0.6029

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