

49th Annual Monetary Studies Conference
Central Bank of Belize and Caribbean Centre for Money and Finance
(CCMF)

**The Impact of Banking Deregulation on the Banking System:
Exploring the facts for Barbados**

Abstract

It is generally agreed that a healthy banking system is a potential driver of a country's economic growth. This means that knowing the factors which affect, among others, the efficiency and competitiveness of banks is ultimately important as these factors can to a large extent explain the dynamics of a country's economic growth. It is also, however, important to acknowledge that some factors have rather ambiguous effects on the banking system. One such factor is bank deregulation as its impact can go either way (see literature). The present paper, which is part of a larger project entitled "The Impact of Banking Deregulation on the Banking System: A Case Study of Barbados", attempts to highlight and explain the facts embedding the responses of banking system to bank deregulations (April 8, 2013, and April 21, 2015) in Barbados. Of particular importance, it examines whether the facts match the expectations. Descriptive statistics including correlations are the main tools used to uncover and examine the facts. Preliminary results indicate a negative correlation between commercial bank deposits and credit union deposits in the period of June 2016 to March 2017, that is, one year after the full removal of the interest rate floor on saving rates. The relationship is otherwise positive in other periods. The interest rate spread has been trending upwards due to deposit rate adjustments while lending rate adjustments have been minimal. After the occurrence of the partial deregulation event of 2013 the Treasury bill rate was on a decline and compounded with the second event, rates achieved pre-financial crisis levels; reaching rates of 2%. This decline was short lived since from December 2015 to January 2016 the rate increased by 95% from 1.76% to 3.44% and since then it has been oscillating between 3.1% to 3.5%. These preliminary results question the wisdom of deregulation.

Nlandu Mamingi*, Michelle Doyle-Lowe, Quinn Weekes and Sheldon Shepherd
***Corresponding author. Email nmamingi@justice.com; tel; (246)259-9091.**

I. INTRODUCTION

Conventional wisdom posits that Central Banks' policy objectives are geared towards preserving the stability of the economy and adequacy of international reserves. One means of achieving these objectives is by ensuring a well-functioning financial sector through the regulation of domestic interest rates; which acts as a price signal to both borrowers and lenders of funds. As suggested by Jackman, Craigwell and Doyle-Lowe (2013), the implicit adjustment of domestic interest rates in Barbados is a market-driven process, which does not require policy intervention. However, with zero intervention the adjustment may be lagged, characterized by domestic rates that are inconsistent with economic factors and financing requirements. Therefore, the objective of the local Central Bank's interest rate policy is to smooth the process of adjusting domestic rates in response to changes in foreign rates, to minimize potential losses in foreign reserves. As the record shows, in tranquil times the Barbados T-bill rate has been little different from the U.S rate, but there are occasions such as the 2007/08 international recession when it may be misleading to follow the U.S. rate closely.

When the system is not functioning in line with policy objectives, deregulation of the local banking system is an alternative approach to interest rate policy. Deregulation or financial liberalization as it is often referred to as in the literature, can be defined as the removal of restrictions on the functions and operations of the financial sector. In this paper, deregulation is understood as the domestic liberalization of interest rates on deposit accounts held by the five commercial banks. In other words, market forces will now determine the interest rates on deposits accounts. Proponents of deregulation argue that the removal of these restrictions will correct the inefficiencies in the market which will result in said market operating at full capacity (McKinnon, 1973 and Shaw, 1973). Conversely, authors such as Stiglitz & Weiss (1981), argue that many exaggerate the extent to which financial repression is responsible for inefficiency in the system. These authors further assert that the removal of interest rate controls and other restrictions can create a breeding ground for distortions. In general, the literature shows that deregulation is not necessarily beneficial in all cases.

Several countries within the Caribbean region have already been through the process of full interest rate liberalization and partial liberalization in some cases. Jamaica and Trinidad and Tobago's interest policy frameworks are the closest to that of Barbados' in the Caribbean.

Since the onset of financial liberalization in 1990 in Trinidad and Tobago, the monetary policy framework of Central Bank of Trinidad and Tobago has placed greater emphasis on the use of market-based instruments (open market operations) rather than on direct policy instruments to affect monetary policy. During the years following 1990, Trinidad's interest rate spread was shown to have widen from 6.9 percent in 1990 to 8.8 by the end of the decade in 1999 (Moore and Craigwell, 2002). While the weighted average deposits rate was increasing over the period, the lending rate was increasing at a faster rate, hence the widening of the spread.

In mid-2002, the Central Bank of Trinidad and Tobago implemented a new monetary policy framework based on the use of the Repurchase ('Repo') rate¹. Changes in the 'Repo' rate were intended to be used to signal to the banking system the direction in which the Central Bank wishes short-term interest rates, and ultimately, the whole structure of interest rates, to move. Going forward, the interest rate spread has since been narrowing with the exception of the period surrounding the Global Financial crisis of 2007-2008. The narrowing of the spread has been dominated by decreases in the lending rate, despite the declines in the weighted average deposit rate. Although the spread has been narrowing, it still remains quite high at 7.7 percent due to a weighted average lending rate of 8.3 percent and weight average deposit rate of 0.6 as at March 2017.

In the case of Jamaica, financial liberalization took place in 1992. After which, Jamaica saw its interest rate spread increased from 6.8 percent in 1991 to 28.29 percent in 1995, during a banking crisis. Gordon (2001) partially attributed it to the weak supervisory capacity of the monetary authorities at the time. From 1993, the commercial banks began to suffer the consequences of high liquid asset reserves and excessively high interest-rate structures. There were large margins within deposit and lending rates. Deposit rates ranged from 20.79 per cent

¹ The Repurchase ('Repo') rate is the rate at which the Central Bank charges commercial banks for borrowing funds on an overnight basis.

per annum to 39.8 per cent per annum, based on the amount of deposit, as well as the maturity period. Lending rates ranged from 44.22 per cent per annum to as much as 61.32 per cent. The interest rate spread for commercial banks was 21.52 per cent in 1994 and then increased even further to 28.29 per cent the following year.

The objective of this paper is to discuss the rationale behind the new interest rate policy framework which was implemented in Barbados and examine its impact on the financial sector. To do so, the paper will provide an analysis of the two deregulation events which occurred on April 8, 2013 and April 21, 2015. Given that the paper is purely descriptive in nature we revert to simple descriptive statistics including correlations as the main methodological tools being utilized. The paper is organized as follows. Section II provides a historical account of the interest rate policy framework prior to the deregulation events of interest. Section III discusses the interest rate policy framework that was proposed, stipulating the deregulation of interest rates, Section IV deals with a description of the two deregulation events aforementioned. Section V provides a descriptive analysis of how market behavior changed within the financial system after the events followed by concluding remarks.

II. CENTRAL BANK OF BARBADOS: INTEREST RATE POLICY

The conduct of interest rate policy in Barbados can be traced back to the early 1970's when the bank was first established. The rationale behind such policies was predicated on: (1) the recognition that financial markets were highly imperfect; (2) the imperative of economic development; (3) a concern to insulate the economy against the extreme volatility of the international financial system, and (4) the development of financial market (Blackman 1998).

Further, given the oligopolistic nature of the commercial banking system in Barbados, where only five large banks are in the market, market imperfection is prevalent. In these conditions, prices tend to be higher than in a purely competitive situation and as a result excess profit will usually be realized. This is the case in Barbados, where commercial bank loan rates on average, rose steadily in times of tight liquidity but were otherwise sticky downwards. On the other hand,

deposit rates on average, fell rapidly in the periods of excess liquidity but proved most sticky upwards.

The Central Bank of Barbados then, to bring about market conditions which simulated, as closely as possible, those which would prevail in a theoretically perfect market, exerted in the financial markets their “countervailing power”. In 1976, the Central Bank for the first time, directed that commercial banks should lower their prime and average lending rates to levels not exceeding 8.5 percent and 10 percent, respectively. In addition, just two years later the bank placed a floor of 3 percent for the savings deposit rate. In 1980, the savings deposits rate floor was increased to 5 percent and further adjusted to 7 percent, in tandem with increases to the minimum lending rate. In 1982, the minimum rate on savings deposits was lowered to 6 percent, the minimum lending rate to 10 percent, the average lending rate to 13 percent, and the mortgage rate to 11 percent for residential and 13 percent for commercial mortgages. A year later, the minimum rate on savings deposits was reduced back to 5 percent, and the minimum lending rate to 9 percent, while the average lending rate was stipulated to be 11.5 percent by second quarter end. In general, these frequent adjustments to the interest rate policy framework over the years were used to ensure that an adequate supply of credit flowed to the productive sectors of the economy in both times of excess and tight liquidity, especially to the foreign exchange earning sectors.

In addition, they were also used to insulate Barbados from external threats, given the “openness” nature of the country’s economy. For instance, in 1973 international interest rates began to reach unprecedented levels, where the Monetary Authorities permitted interest rates to rise as high as the survival of the industry and commerce seemed to permit. As such the Bank in 1981, allowed the minimum savings rate to reach 8 percent and the average lending rate to peak at 15 percent while increasing its discount rate to a record of 22 percent to discourage foreign banks from substituting short-term borrowing from the Central Bank for head- office accommodation.

In August of 1991, the ceiling on the average lending rate was removed while the minimum savings deposit rate was raised from 5.5 percent to 7 percent and the ceiling on the residential mortgage rate for both old and new houses was increased unified at 11 percent. The indicative weighted average rates of interest on loans from commercial banks were then removed in April

of 2003, giving the markets the power to determine lending rates. From this point, the Central Bank's main interest rate policy tool became the minimum deposit rate up until the deregulation events of 2013 and 2015.

III. THE PROPOSED INTEREST RATE POLICY FRAMEWORK

In 2012, the Central Bank of Barbados proposed a new interest rate policy framework in which interest rates would be influenced by intervening directly in the market for Treasury bills instead of using the minimum deposit rate as a guide to affect commercial banks' lending rates and thus economic activity. This new framework, which stipulated the deregulation of interest rates, was aimed to promote a more predictable economic environment characterized by a stable interest rate structure and an adequate market infrastructure that responds to liquidity conditions. It takes into consideration the realities of the financial environment, such like the rigidities in the system which would encumber the allocation and access to funds for economic activity.

Worrell et al.(2012) proposed framework, stated that the traditional interest rate tools would be managed as follows: (1) Minimum Deposit Rate – will no longer be the Bank's policy rate but will instead be referenced as the minimum savings deposit rate payable. This rate will be set to protect the real value of the savings of private individuals; and (2) The Discount Rate – the Central Bank's discount rate will no longer be adjusted to signal the direction of domestic interest rates. Instead the rate will be determined using a base rate of the 3-month T-bill rate plus a spread.

Under the framework, there would be two factors that would inform the interest rate policy: (1) the trend in international interest rates and (2) whether there is a perceived need for a temporary inflow of finance to supplement domestic liquidity. Both theory and practical experience indicate that whatever impact interest rates may have on the availability of domestic credit and spending is attenuated if local banks, firms and households have recourse to funds abroad. In this event, if domestic rates are higher than those offered internationally then it is possible to borrow more cheaply abroad as current capital controls are not sufficient. Therefore, in order to avoid

incentives for destabilizing inflows and outflows of capital, domestic rates have to be comparable to international rates. The two factors (outlined in parts “1” and “2”) would then serve as a guide to the Central Bank of Barbados in determining its (internal) notional policy rate, with an allowance for the appropriate spread.

The Treasury bill rate would be used as the market-determined benchmark rate. This is because the Treasury bill auction process provides an institutional mechanism for an ongoing market interaction between financial institutions and the Treasury. As such, where warranted the Central Bank of Barbados would intervene in the T-bill market to signal to the market the need for interest rate adjustments, if there is a sustained change in the U.S. and the domestic interest rate spread or if there is a continuous shortfall in T-bill auctions.

Financial institutions will be free to set loan and deposits rates, except that there will be a floor on the rate on savings deposits only. This floor, however, is not a policy rate but is intended to protect the savings of households of modest means. This rate would change less frequently, and will not be related to the policy rate.

IV. DEREGULATION OF THE DEPOSIT RATES

A. Deregulation Event of April 18, 2013

In line with the proposed framework in 2012, the Central Bank of Barbados announced on April 4, 2013, a new approach to influencing the interest rates in the economy. Effective April 18, 2013, the Bank indicated that from time to time they will intervene actively in the Treasury bill market to influence the average rate at which the bills are sold. Coupon rates to be offered on all longer dated securities (Treasury Notes and Debentures) would be priced at an appropriate premium over the Treasury bill rate.

In addition, the minimum deposit rate would no longer be used for interest rate guidance with the introduction of this policy. The bank however, would continue to stipulate a ‘minimum savings rate’ to the single purpose saving accounts of private individuals and non-profit organizations.

This rate was designed to partially insulate small savers against the erosion of the real value of their funds as a result of inflation. As a result, the minimum savings rate was to remain at 2.5 percent. In turn, financial institutions would then have the freedom to set all rates, other than the minimum savings rate.

B. Deregulation Event of April 21, 2015

The Central Bank of Barbados announced on April 7, 2015, that effective April 21, 2015 it would no longer stipulate a minimum rate of interest on savings deposits at commercial banks. As a result, commercial banks would have the ability to determine the rate to be paid on savings accounts in light of market conditions, in the same way that they could for all other interest rates.

While this policy was not covered explicitly in the proposed framework, the overall decision was in line with the Central Bank's desired market-driven interest rate approach. This event thus, completed the process of dismantling a regime of structured interest rates on loans and deposits which dates back to 1976. It allows commercial banks to set saving deposits in line with other deposit rates and with loan rates and rates on mortgages and for the Central Bank to offer guidance through financial market activity rather than by way of the interest rate stipulations.

V. THE POST DEREGULATION EXPERIENCE

A. Banking System

Interest Rate Spread

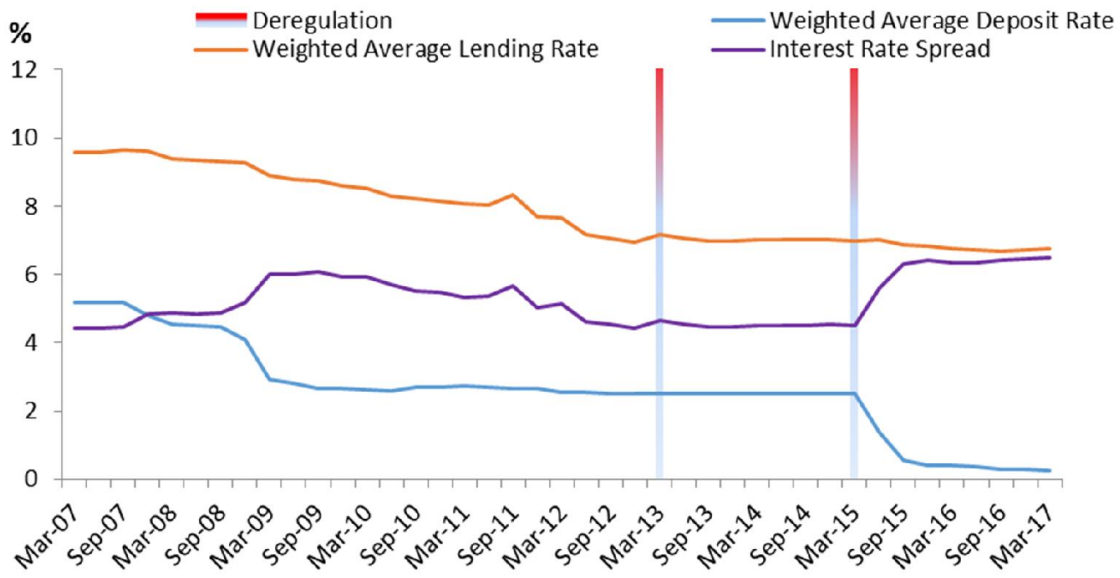
In the years leading up to the full removal of the minimum deposit interest rate floor, the Barbadian economy was experiencing a narrowing of the interest rate spread from approximately 5.94 percent at year-end 2011 to 4.49 percent at the end of the first quarter 2015 (Figure 1). The full removal of the interest rate floor however, swiftly reversed the downward trend. By the end of the second quarter, two months after the event, the interest rate spread increased by 25 percent (110 basis points) driven primarily by a 50 percent (110 basis points) decline in the average

deposit rate from 2.5 percent to 1.4 percent. This however was expected as over the last 10 years, the deposit rate has been on a general downward trend up until 2014 where commercial banks reached the floor of 2.5 percent. As at March 2017, the deposit rate decreased to 0.26 percent, revealing a total decline of about 90 percent (224 basis points).

The exponential decrease of the deposit rate was, however, not met with significantly lower lending rates. In fact, despite the weight average deposit rate falling by 224 basis points, the lending rate only declined by 24 basis points (3.6 percent) since the full removal. These occurrences in turn, further widened the interest rate spread by 45 percent (200 basis points) which stood at 6.5 percent at March 2017, the highest within the last ten years. This however comes as no surprise due to several features of the Barbadian banking system. Past experiences have shown that in high liquidity environments such as that of the current (Figure 2), deposit rates tend to rapidly decrease while lending rates tend to be super sticky downwards (Blackman 1998). Moreover, given the oligopolistic nature of the commercial banking sector, banks tend to react to monetary policy by widening the spread (Moore, 2002). Mortgage rates², a primary component of the weight average lending rate, have been on a continuous decline prior to the deregulation event. Further, with the raise of non-interest expenses from compliance related expenditure among other things (Figure 2, Brathwaite et al. 2017) and a decline in credit activity, banks' must improve their interest margin to maintain profitability levels.

² Mortgage loans represent 44 percent of total commercial bank loans as at March 2017.

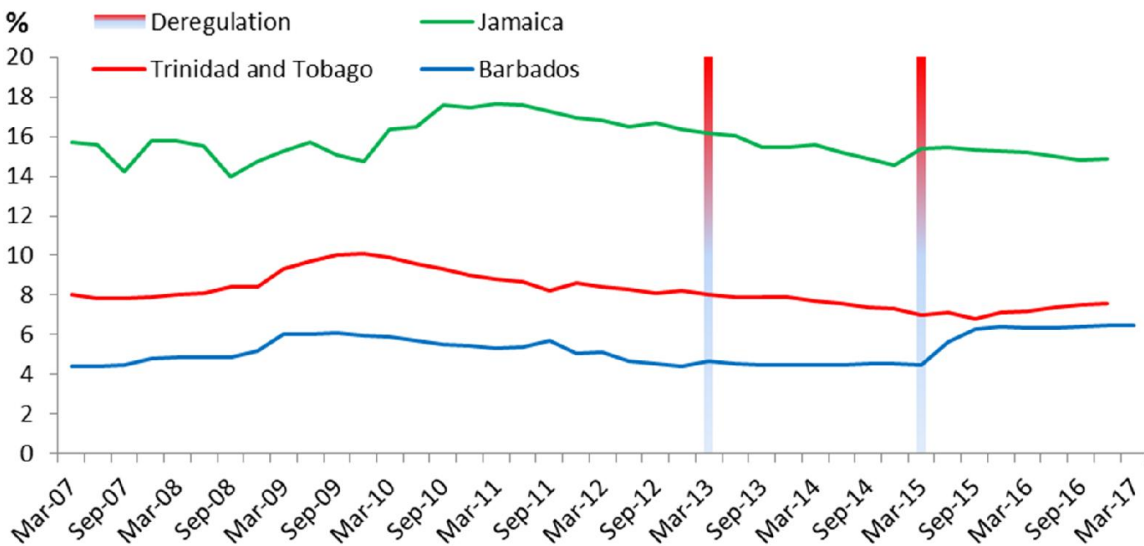
Figure 1: Interest Rate Spread



Source: Central Bank of Barbados

Overall, despite the widening of Barbados’ interest rate spread it still remains below comparable countries within the region³, see Figure 3. Looking forward, given that deposit rates are nearing zero along with decreasing lending rates, the spread is expected to eventually reach a point where it begins to contract.

Figure 3: Comparative Interest Rate Spreads



Sources: Central Bank of Barbados, Central Bank of Trinidad and Tobago and Bank of Jamaica

³ Jamaica and Trinidad and Tobago both have market-driven interest rate regimes.

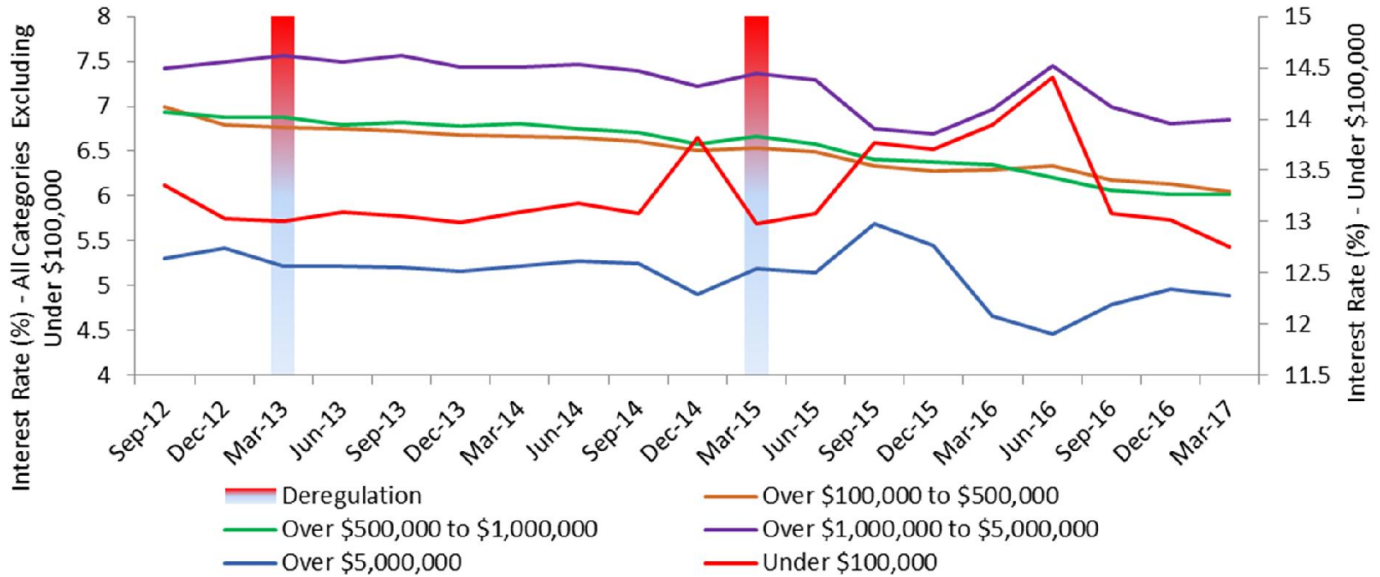
Lending Rates

The weighted average lending rate, as mentioned previously, declined slightly relative to adjustments made to the deposit rates post the full deregulation event. The mortgage rate, a primary indicator for long-term interest rates within an economy, continued on its pre-deregulation downtrend and stood at 5.85% at March 2017. This indicates that the long-run cost of borrowing in Barbados is decreasing, in line with general global trends plus a premium.

In terms of rates by loan size, on average all categories⁴ decreased by 1.93 percent (14 basis points) one year after the first event. The “Over \$100,000 to \$500,000” category saw the largest decline of approximately 3.65 percent (24 basis points), while “Under \$100,000” had the smallest decline of 0.89 percent (12 basis points). One year after the second event, all categories with the exception of the “Under \$100,000” category experienced a fall in their respective interest rates. The “Under \$100,000” instead, experienced an increase of 6.7 percent (87 basis points), standing at 13.88 percent as at April 2016 and further peaking at 14.04 in June 2016. Going forward however, the category’s trend has since reversed and as at March 2017 stood at 12.76 percent compared to 13 percent as at April 2015 and 13.12 percent as at April 2013.

⁴ Loan categories were as follow: “Under \$100,000”, “Over \$100,000 to \$500,000”, “Over \$500,000 to \$1,000,000”, “Over \$1,000,000 to \$5,000,000” and “Over \$5,000,000”.

Figure 4: Interest Rates by Loan Size

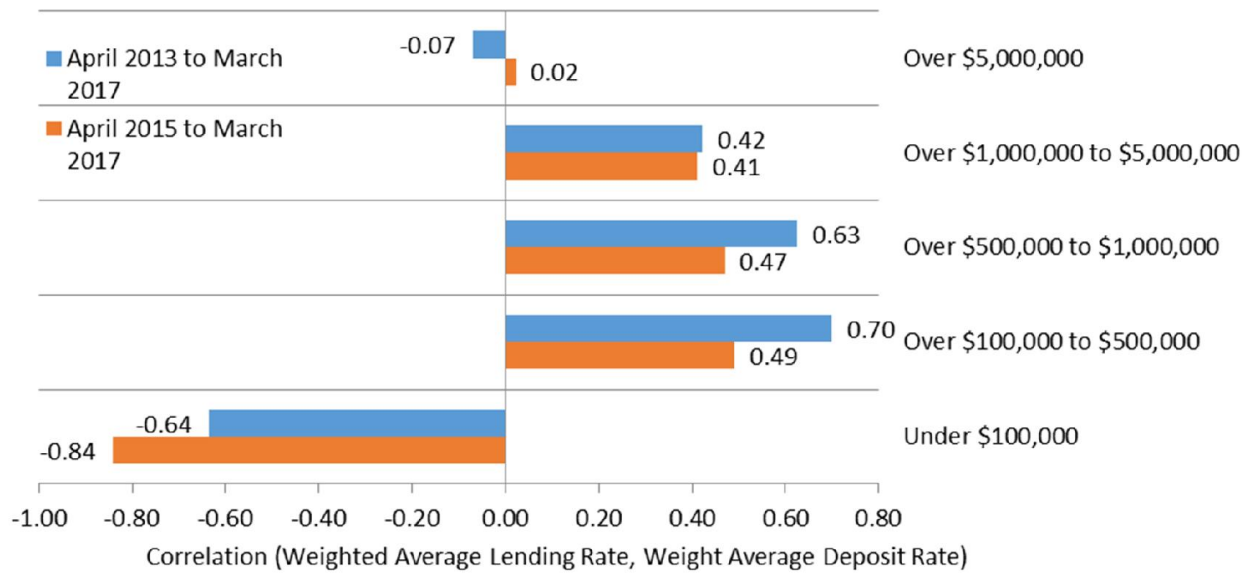


Source: Central Bank of Barbados

Smaller loan categories by size were found to generally have stronger correlations with the weighted average deposit rate when compared to larger categories (Figure 5). From the period April 2013 to March 2017, “Over \$100,000 to \$500,000” was observed to have the strongest correlation of 0.698, while “Over \$5,000,000” had a correlation of -0.07. The “Under \$100,000” category was the only other category to have a negative correlation, which was -0.64. From April 2015 to March 2017, all categories’ correlations were shown to be weaker with the exception of the “Under \$100,000” which increased in magnitude to -0.89.

Overall, although lending rates are on a relatively slow decline, their volatility has increased for all categories, primarily after the second event of 2015. “Under \$100,000” was shown to be the most volatile, while “Over \$5,000,000” was the least (Figure 6). These observations suggest that the cost of borrowing smaller loans are not only more associated with deposit rates but microfinance lending rates have a negative relationship with deposits rates and are the most volatile in Barbados.

Figure 5: Correlations (Lending Rates by Loan Size and the Weight Average Deposit Rate)

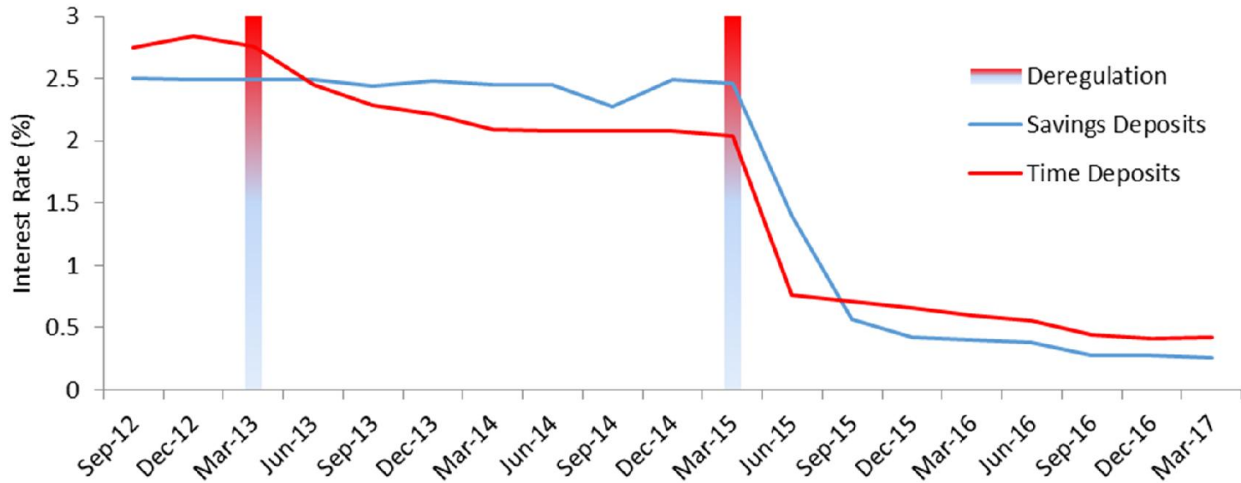


Deposits Rates

The weighted average deposit rate, as mentioned previously, declined exponentially since the second deregulation. Specifically, one year after the event, the savings deposits rate decreased by 77.8 percent (139 basis points) while the weighted average time deposit rate declined by only 6.8 percent (4 basis points). This is so because, while the savings deposits rate was mostly protected by the floor on private individual accounts⁵, time deposit rates were experiencing exponential declines post the first event in 2013. To be specific, the weighted average time deposits rate after the first event to April 2015, decreased by 75.8 percent (199 basis points).

⁵ Private Individual deposits represented on average, 85 percent of total savings deposits and 50 percent of aggregate deposits over the period 2010 to 2016.

Figure 7: Weighted Average Deposit Rate by Type



Source: Central Bank of Barbados

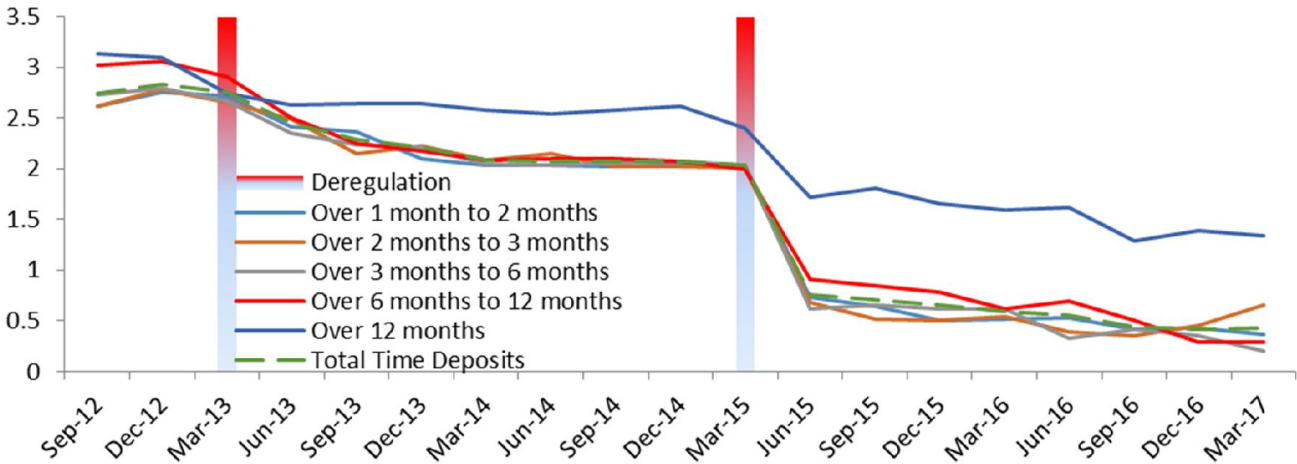
The conventional wisdom is that time deposits with longer maturities should bear higher interest than those with lower maturities (reference). Further, in times of declining deposit rates one would expect two things. Firstly, that as time deposits rates decline, the positive relationship between maturity and interest holds. Secondly, the rate at which the time deposits decline is partially dependent upon the maturity. Whereas, the longer the maturity of the time deposits, the slower the rate of which the interest rate declines relative to shorter maturities.

Prior to 2013 in the sample, the various maturity buckets of time deposits generally displayed the theoretical positive relationship between maturity and the interest rate. From 2013 onwards, the relationship broke down as rates began to fall, especially after the first deregulation event (Figure 8). Although the longest bucket, 12 months and over, bore the highest interest for most of the period, between February 2013 and June 2013 the over 6 to 12 months bucket momentarily was the highest. In addition, while the 12 months and over bucket had the slowest decline of about 3 basis points on average on a monthly basis from April 2013 to March 2017, the fastest bucket was the over 6 to 12 month, declining by 5.6 basis points on average. Not only did the over 6 to 12 month bucket decline the fastest but also declined the most over the same period. From April 2013 to March 2017, the bucket's interest rate declined by 90 percent (262 basis points) while the 12 months and over bucket declined the least, by 51.1 percent (140 basis points). The shortest bucket, less than 1 month, declined by 82.4 percent (235 basis points) further widening the gap

between the shortest and longest maturity bucket. This phenomenon was also observed with both the upper and lower bounds of time deposits interest rates in the fixed maturity categories of 3, 6 and 12 months (Figure 9).

As at March 2017, the weighted average deposit, savings deposits and weighted average deposit interest rates stood at 0.26, 0.26 and 0.42 percent respectively. The 12 month and over deposit maturity bucket held the highest interest of 1.34 percent and the over 3 months to 6 months bucket yielded the lowest, of 0.24 percent. Looking forward, it is expected that deposit interest rates will continue to decrease as liquidity continues to build up in the system and in some cases, reach an interest rate of zero.

Figure 8: Weighted Average Time Deposits Interest Rates by Maturity



Source: Central Bank of Barbados

Deposits

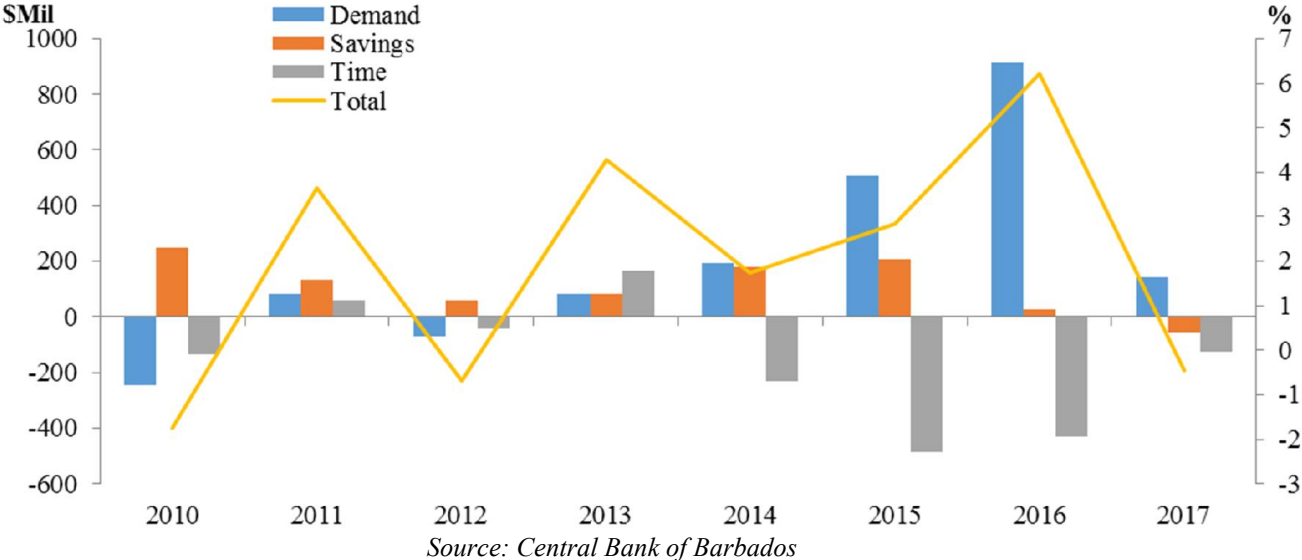
Aggregate deposits have grown (April on April) for the past two decades with the exception of four years, of which three were surrounding the financial crisis⁶. Since the first deregulation event, deposits have continued to grow, averaging 3 percent annually (Figure 10). In fact, from April 2013 to April 2017, aggregate deposits grew by 12.6 percent. However, while aggregate deposits have increased, declines in saving deposits were observed in 2016, one year after the

⁶ April on April in the last two decades, commercial banks' aggregate deposits declined in 2005, 2009, 2010 and 2012.

full removal of deposit rate stipulations and continued into 2017. The increase observed in aggregate deposits was primarily driven by Demand deposits which increased by approximately 62 percent between April 2013 and April 2017.

Notably in April 2013, deposits were distributed as Savings (51.6%), Demand (30.4%) and Time (18.0%). As at April 2017, the distribution has significantly changed to Savings (47.6%), Demand (44.1%) and Time (8.3%). This indicates that consumers’ preference for excess cash allocation has changed to more liquid deposit accounts given the reduction in interest earned on funds.

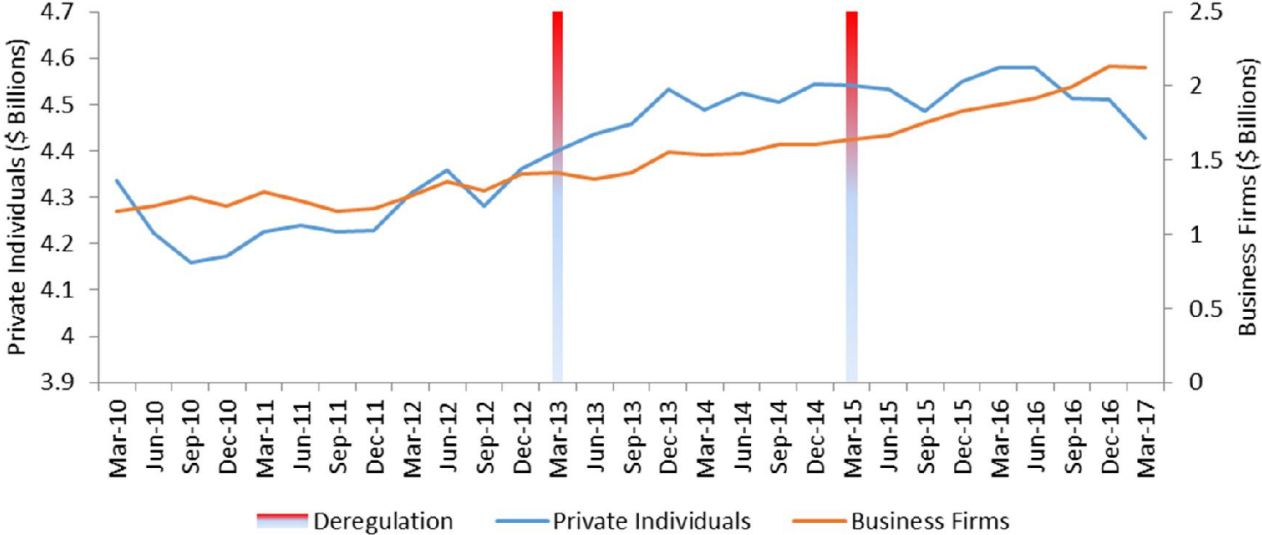
Figure 10: Changes in Commercial Bank Deposits



Business firms’ deposits (24% of total deposits as at April 2017) continued to grow despite the occurrence of both deregulation events. In particular, the Distribution and the Manufacturing sectors saw increases, while the Tourism and Construction sectors remained moderately sideways. The resilience of business firms’ deposits to the decrease in interest may be due to the firms utilizing the other intermediary functions the banking sector provides such as facilitating business transactions, overdraft facilities and payroll services among others which may be more preferred over other institutions. On the other hand, this may be indicative of there being a lack of favorable investment opportunities for business firms to reallocate their excess funds to within the Barbadian economy. In terms of private individual accounts (51% of total deposits as at April

2017), while the first deregulation event did not fully impact their deposits rate, post the full deregulation event, their deposits have been on a general downtrend (Figure 11). Starting from the third quarter of 2016, private individual deposits have been continuously declining with an overall decrease of 2.2 percent (\$100 M) between April 2015 and April 2017.

Figure 11: Commercial Bank Deposits held by Business Firms and Private Individuals



Source: Central Bank of Barbados

Interestingly, it has been hypothesized that saving deposits from the commercial banking sector have been reallocating to the credit union sector. Annual (June to March) correlations between commercial banks’ saving deposits and credit unions’ regular shares (deposits) were observed to be positive and strong from 2004 (June 03 to March 04) to 2016 (June 15 to March 16). The June 2016 to March 2017 period however, was the only year to witness a negative correlation (-0.64). This is a prime indicator that some type of structural change occurred post the full deregulation event of 2015. Further, the correlation between private individual deposits and the credit union deposits in the same year was shown to be -0.95 in line with the decreases observed, while in previous years it was mostly strong and positive (Figure 12). These occurrences are in support of the hypothesis that consumers’ saving preferences may have structurally changed as a result of deregulation and also suggests that consumer fund allocation decisions suffer from inertia, given the delay.

Although, there may exist a deposit leakage from the banking system, other sectors such as the credit union sector have been shown to not significantly threaten the operations of commercial banks (Belgrave et al., 2006). As at March 2017, aggregate credit union deposits stood at \$1.5 billion, compared to commercial banks' aggregate of \$4.3 billion. Looking forward, if the current low lending and investment environment continues, deposits in the banking system are expected to continue growing (if only marginally) with depositors opting for more liquid accounts such as demand deposit accounts.

Credit (Loans and Advances)

Leading up to the Global Financial Crisis of 2007-2008, credit grew substantially⁷. From 2005 to 2007, credit grew by 18 percent on average annually followed by growth of 6.1 percent and 10.3 percent in 2009 and 2010 respectively. Post the crisis however, overall credit growth significantly slowed. In 2010, credit grew marginally by 0.87% and then contracted for the first time in a decade by 1.67 percent in 2011. A year after the first deregulation event, April 2013 to March 2014, credit contracted again, by 2.5 percent which continued with further contractions in the following year of 0.6 percent. A year following the second event, credit continued to contract with by magnitude of 2.2 percent. On the other hand, while overall credit has been shown to be contracting, personal loans, which accounts for over 50 percent of the commercial banks' loan portfolio, have been consistently growing (Figure 13).

The slowing and contraction in commercial bank credit however, cannot be fully attributed to the deregulation events of 2013 and 2015. The main channel through which deregulation of deposit rates influence credit is through adjustments to lending rates. This is so because, removing stipulations on deposit rates, allow banks to reduce interest expense and in turn improve profitability, while creating sufficient space in their interest margins to lower lending rates to remain competitive. However, given the marginal changes observed with respect to the lending rates, other factors may have given rise to the current credit environment. In particular, the macro-environment such as unemployment, inflation and the general economic growth prospects (Lowe and Grosvenor, 2014). While, the deregulation events may not have significantly impact

⁷ Credit growth was calculated at the year ending March.

commercial banks' loan portfolio, overall bank profitability was shown to have improved after the occurrences.

Commercial Banks' Profitability

Bank profitability, as measured by return on assets, has been relatively high in Barbados prior to 2010 (Figure 14). More specifically, net income as a ratio of total assets averaged 1.6 over the period 1996-2009, which is as high as the region's average and much higher compared to the average 0.6 percent in the advanced economies (Table 3, Birchwood et al., 2017). However, since 2010 the return on assets dropped persistently to an average of 0.9 percent even though profitability has returned to higher levels in most recent years. Braithwaite et al. (2017) discussed several factors which influenced the variation in the banks' profitability in Barbados. Higher inflation was found to reduce the return on assets and increase salaries and benefits expenditure. Banks with higher loan-to-asset ratios were observed to have significantly higher non-interest expenses and head office fees. Further, large banks were observed to have a larger fraction of operating income being professional fees, after controlling for the business cycle and other bank-specific characteristics. Most importantly however, using a cumulative dummy variable (representing the post-2010 events in relation to the prevalent de-risking phenomenon), their study showed that the post-2010 events significantly impacted the banks' cost and income structure⁸.

Overall, banks' return on assets dropped in response to the post-2010 events by 0.28 percent of assets (equivalent to 1/5 of the average return on assets). Further, the drop in profitability was explained primarily by an increase in non-interest expense by 4.58 percent of operating profits. To combat this, banks partly passed on the burden to clients through increases in service fees and reductions in the interest payable on deposits.

The increasing expenses faced by the banks coupled with their recent display of risk aversion behavior has led to a more cost-reducing approach being observed, rather than driving net

⁸ (i) Enactment of FACTA in the United States (March 2010), (ii) Basel III announcement (December 2010) and (iii) Legal authorization of a John Doe Summons Act concerning the identification of U.S. accounts at a Caribbean based Canadian subsidiary (April 2013)

income growth through the growth of their respective loan portfolios. As the deregulation of deposit rates primarily impacts the interest side of bank profitability rather than the non-interest component, banks' net interest margin will be the focus⁹. Over the period from 2010 to 2016, incremental correlations of the net interest margin and gross interest income have shown a decreasing positive relationship. On the other hand, incremental correlations of the interest margin and interest expense were revealed to be increasing in magnitude, negatively (Figure 15). In 2013, the incremental correlation in respect to gross deposit interest expense became negative, signifying a structural shift in the relationship. Thus, indicating that banks' net interest margins are increasingly becoming more associated with cost-reducing rather than income-earning, following the deregulation events.

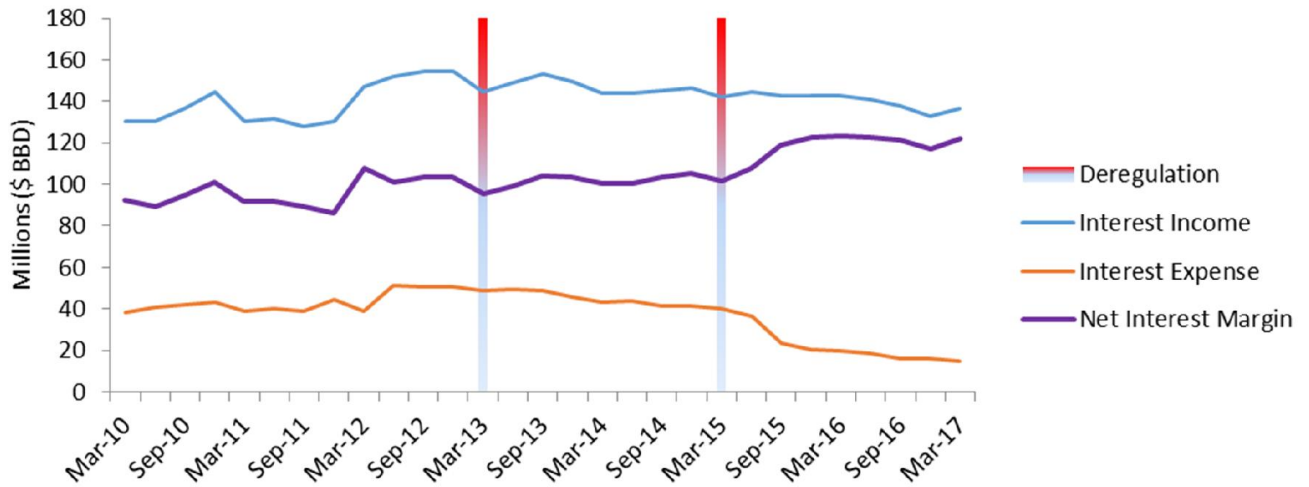
Notably, all categories of deposit expenses had an average correlation of -0.80 with Savings Deposits having the strongest relationship of -0.84. Interest income from Loans, Advances & Discounts however, was shown to have a low correlation of 0.12. As such, it comes by no surprise that with the deregulation of deposit rates, banks' net interest margins increased significantly compared to prior years. In particular, with the full removal in 2015, banks saw an increase of 10 percent within the first year and a further 7 percent in the following year (Figure 16).

In terms of the overall profitability, one year after the full removal deregulation of deposit rates, banks' return on assets increased from 0.7 percent (as at March 2015) to 0.9 (as at March 2016). Going forward, banks' return on assets have steadily improved and as at March 2017 stood at 1.1%, the highest since the declines in prior years.

Looking forward however, the present upward trend is expected to dampen. The net interest margin (over 70 percent of banks' total operating income) will eventually narrow, given that deposit rates are nearing zero along with marginal credit activity and declining lending rates to remain competitive with rest of the financial sector.

⁹ Interest Income represented over 70% of operating income year end March 2017.

Figure 16: Commercial Banks' Net Interest Margin



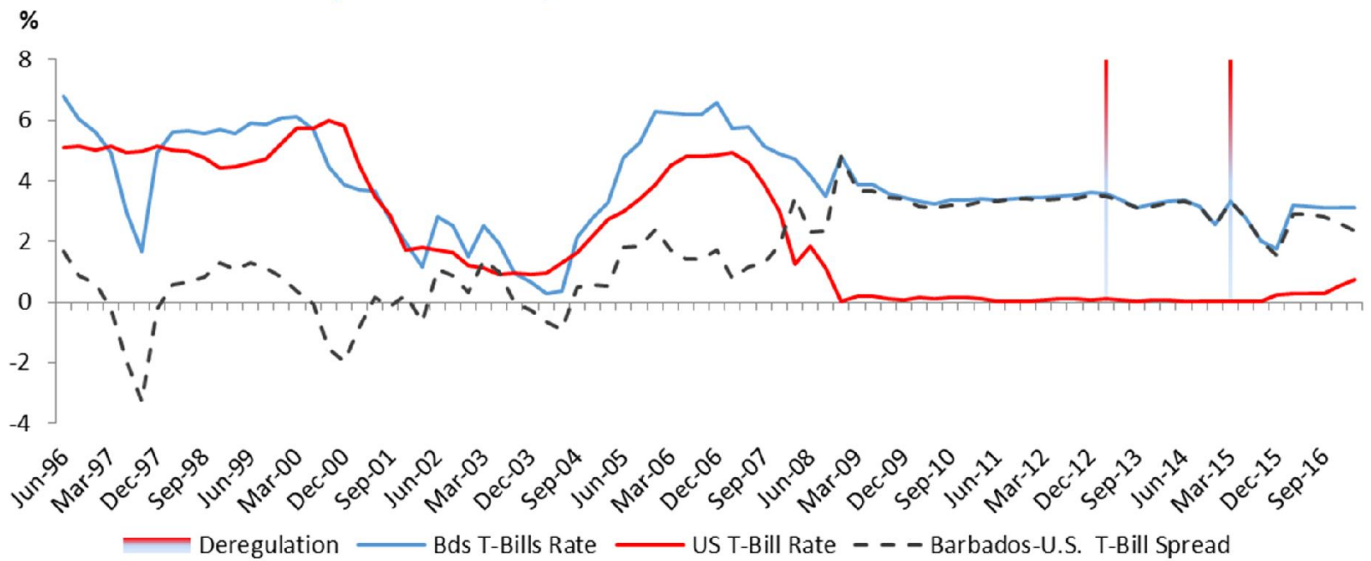
Source: Central Bank of Barbados

B. Government Securities

Treasury Bills

Since the early 1970s, domestic interest rates have generally mirrored the trends in U.S. interest rates, a reflection of Central Bank's policy of ensuring an appropriate spread, where necessary, between domestic and foreign rates (Worrell et al. 2012). As illustrated in Figure 17, which plots the Barbados and U.S. three-month Treasury bill rates over the past five decades, the domestic rate has followed generally the movements in the U.S. rate. There were, however, episodes when the movements in the rates were not in line. The most noticeable periods of divergences were: (1) the late 1970s into the early 1980s and from 1984 to 1990 when the U.S. treasury bill rate was consistently above the domestic rate; (2) the period 1991 to 1996 in which the domestic rate on treasury bills was higher; and (3) from 2003 onwards, characterized by a significantly higher domestic rate compared to a U.S. rate which fell to near zero. In general, the spread between the rates has exhibited an overall upward trend up until 2009, reaching a peak of slightly above five percentage points in 1991. Post the global financial crisis, the spread began to decline and oscillated between 3.11 percent and 3.54 percent on a quarterly basis.

Figure 17: Treasury Bill Rate (Barbados and U.S.)

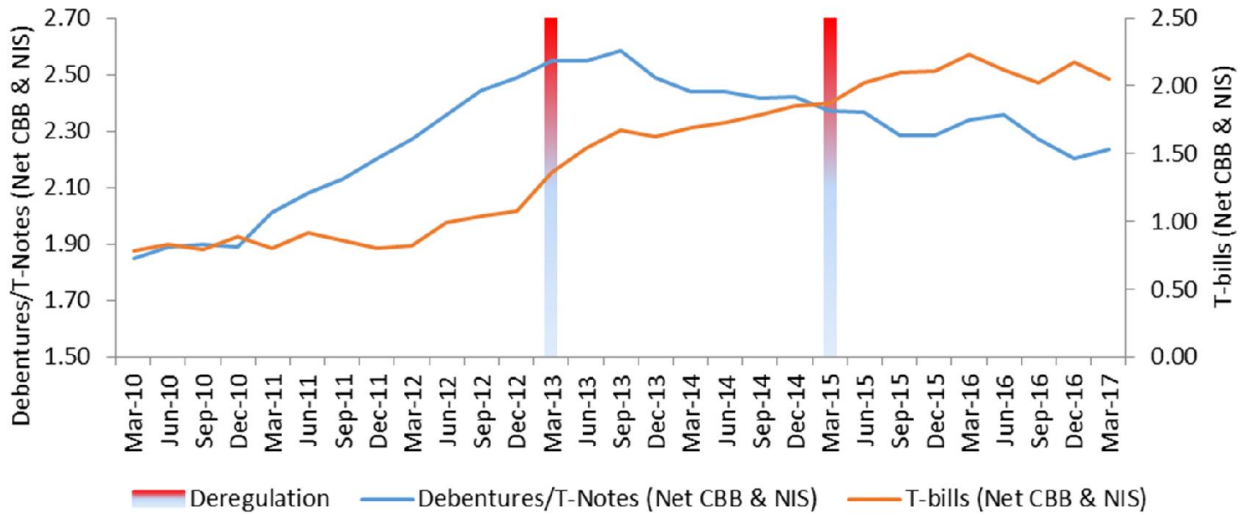


Source: Online Statistics, Central Bank of Barbados

After the occurrence of the partial deregulation event of 2013 the rate was on a decline and compounded with the second event, rates achieved pre-financial crisis levels; reaching rates of 2 percent. Despite all efforts, this low rate environment was short lived. During January 2016, the rate increased by 95 percent (or 168 basis points) from 1.76 percent in December to 3.44 percent and has since been oscillating between 3.1 percent to 3.5 percent.

The momentary decline at first glance may have sent signals of commercial banks and other players bidding lower due to the reduction in their cost of funds (deposit rates). On the contrary, around this time, commercial banks were decreasing their holdings of government securities while the central bank increased its holdings with the purpose of driving down the rate through low auction bidding. Further, as Barbados' credit ratings continued to worsen, banks along with other private entities shifted their holdings in Debentures/T-notes to T-bills (Figure 18). The shift along with private entities bidding higher due to increases in perceived risk has since placed upward pressure on the T-bill rate. It can be said that in order for monetary policy to be successful via T-bill market auctions, the fiscal position of the country must be favorable. For instance, if the government's financing needs are dire, entities which bid at high rates with large volumes cannot simply be rejected.

Figure 18: Government Securities (Net CBB and NIS) in BBD Billions



Source: Central Bank of Barbados

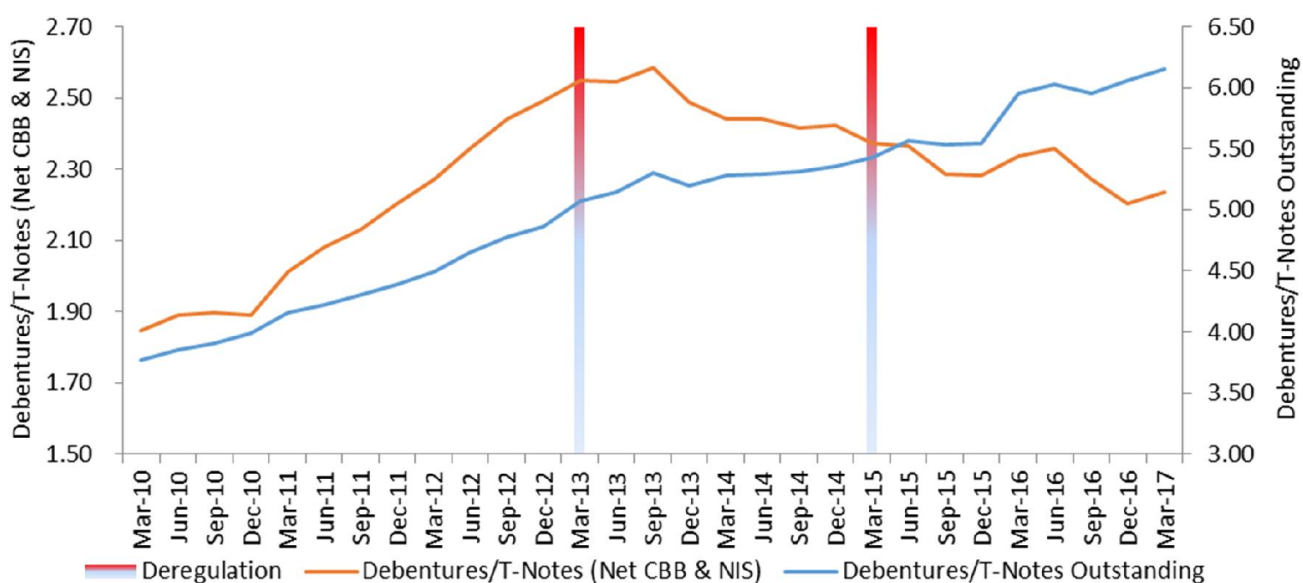
Debentures/Treasury Notes

Since 2005, aggregate outstanding Debenture/Treasury Notes have seen positive growth with an average of 10 percent and a median of 10.4 percent annually. Net Central Bank of Barbados (CBB) and the National Insurance Scheme (NIS) holdings however, outstanding debt went from 16 percent and 13 percent growth in 2011 and 2012, to a decline of 0.12 percent (\$3M) in 2013, the year of the first deregulation event. This was the beginning of the shift of private entities from debentures to T-bills and other asset classes.

Debentures (Net CBB & NIS) continued to decline in the years going forward, with a total decline of approximately 13.6 percent (\$347 M) between April 2013 to March 2017. Commercial Banks' holdings declined by 60.3 percent (\$359 M) and Insurance Companies by 9.2 percent (\$79 M). Credit Unions increased their holdings by 79 percent (\$32 M) and Individuals by 11.75 percent (\$10 M). On the other hand, NIS's holdings grew by 32.9 percent (\$814 M) and CBB's grew by an astronomical 748.2 percent (\$561 M).

These movements observed within the Debentures and Treasury Notes market however, are more likely attributed to Barbados’ worsening credit rating and overall fiscal rather than deregulation of rates.

Figure 19: Debentures/Treasury Notes Outstanding (BBD Billions)



Source: Central Bank of Barbados

Savings Bonds

Savings bonds were first issued by the Central Bank of Barbados in 1980. The Central Bank issues savings bonds on behalf of the Government of Barbados, which uses the money invested in them to fund capital works projects such as the construction of schools and the repair of roads. They are five-year securities that are sold at a discount, which means that investors pay less than the nominal value of the savings bonds but receive the full value when they have matured. As an example, for a savings bonds issue with a yield to maturity of 5.5 percent, the purchase of \$500 (nominal value) would require an investment of only \$381.20, and the purchaser would receive the full nominal value (\$500) when the savings bonds mature.

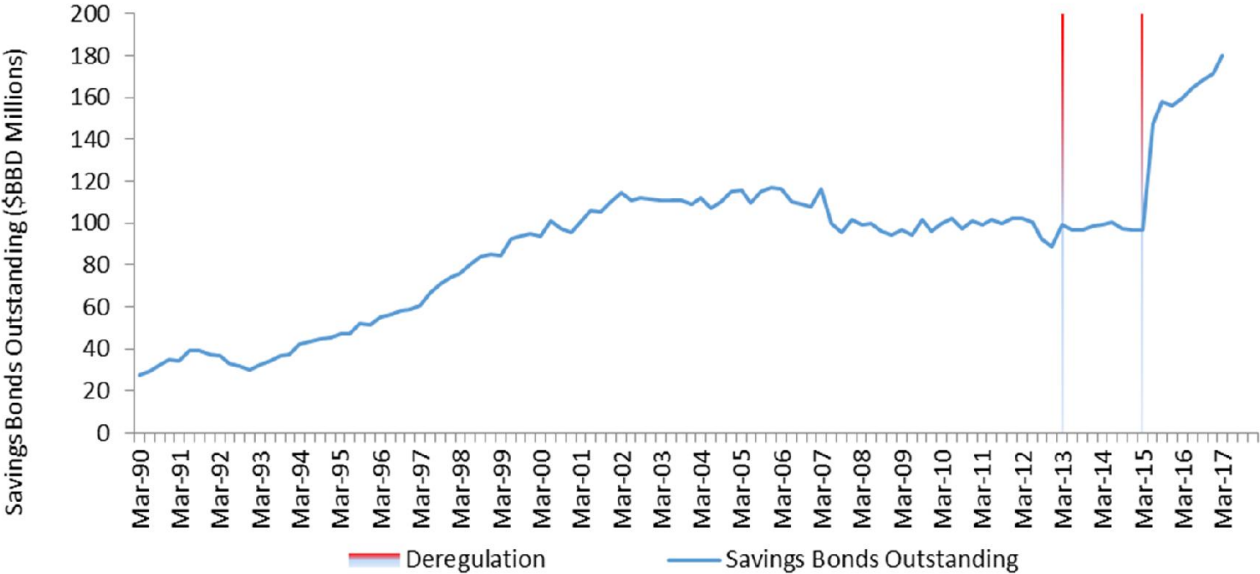
These bonds are offered several times a year and can be purchased by any Barbadian or permanent residents 18 years and older for themselves or on the behalf of their offspring(s).

Credit unions, registered charities and friendly societies are also allowed to purchase savings bonds. Financial Institutions such as Commercial Banks and Insurances however, are not allowed to purchase the bonds.

For series issued before 2015, the maximum nominal value was \$50,000 for all categories of bondholder. From 2015 onwards, the maximum nominal value of savings bonds that can be purchased per series by an individual or organization was increased to \$100,000 and for joint holders \$200,000.

Prior to 2015, there was no material change in savings bonds since 2000. From 1990 to 2000, savings bonds outstanding grew by 269.4 percent (\$70 M), while between 2000 up until the deregulation event of April 2015, savings bonds only grew by 1.6 percent (\$1.5 M). In June 2015, two months after the full deregulation event in conjunction with the new maximum per series purchase and advertisement campaign, savings bonds grew by 53 percent (\$51 M). Going forward on a quarterly basis, savings bonds have since been increasing on average by 3 percent with the exception of September 2015 to December 2015.

Figure 20: Savings Bonds Outstanding



Source: Central Bank of Barbados

VI. CONCLUSION

This paper has used descriptive statistics to assess empirically what took place in the banking system and the government securities market after the deregulation events of April 2013 and 2015, whereby the Central Bank of Barbados removed all stipulations on commercial banks' deposit rates. Thus, granting commercial banks' the powers to now set both their lending rates and deposit rates. The results depicted that, the interest rate spread reserved from its downward trend and widened by 200 basis points since the 2013 event. This was driven by a 224 basis point decrease in the deposit rate with marginal dampening by a 24 basis point decline in lending rates. Micro-loans, "Under \$100,000", lending rates were shown to be the highest correlated with adjustments to the deposits rate and as well as the most volatile after the 2015 event. Moreover, the relationship between maturity and interest rates was shown to be distorted in the case of time deposits. In some instance, the 3-Month Time Deposits' Upper bound surpassed that of both the 6-Month and 12-Month.

Depositors preference since 2015, were observed to have become more favorable of shorter time deposits, such as demand deposits. Notably, Business firms' deposits were observed to be growing despite the decline in interest earned on their deposits. This suggests that there may be a lack of investment opportunities for said firms. Commercial banks' saving deposits were observed to be positively correlated with Credit Union deposits in all years from 2003 up until 2015. In 2016, the correlation was observed to be negative and as well as the correlation between private individual deposits and credit union deposits. These occurrences are indicative of some sort of structural change taking place in term of consumer savings preferences. Commercial banks' were shown to have taken a more cost-reduction approach rather than an income-earning one, following the deregulation events. Specifically, incremental correlations suggest that banks' net interest margins are increasingly becoming more associated with reducing interest expense and less associated with increasing gross interest income.

While the Central Bank was shown to successfully decrease the T-bill rate following the removal of deposit rates, it was rather short lived. This was however, as a result of the fiscal position of the country. Whereas factors such as high financing needs due to the fiscal deficit and the

worsening of the credit rating among others, have led to entities placing higher bids to compensate for higher perceived risks. Due to these higher perceived risks, entities have been shifting their holding in Debentures and T-Notes to T-bills, adding further upward pressure on the T-bill rate. In general, it can be said that if the T-bill rate is to be used as an effective tool to guide interest rates within Barbados, then the fiscal state of the country must be in a sustainable form.

VII. REFERENCES

Belgrave, A., Craigwell, R., & Moore, W. (2006). Commercial banks and credit unions in Barbados: An empirical investigation. *Finance and Real Development in the Caribbean*, 223-236.

Birchwood, A., Brei, M., & Noel, D. M. (2017). Interest margins and bank regulation in Central America and the Caribbean. *Journal of Banking & Finance*, 85, 56-68.

Blackman, C., N. (1998) *Central Banking in Theory and Practice: A small state perspective*. Trinidad and Tobago: Caribbean Centre for Monetary Studies

Gordon, P. (2001), "The Jamaican economy: recent developments and prospects", Souls, pp 22-23

Jackman, M., Craigwell, R., & Doyle-Lowe, M. (2013). Non-linearity in the Reaction of the Foreign Exchange Market to Interest Rate Differentials: Evidence from a Small Open Economy with a Long-Term Peg. *Applied Financial Economics*, 23(4), 287-296.

Lowe, S., & Grosvenor, T. (2014). Developments in Commercial Bank Credit Distribution (1996-2013): Are all banks the same (Working Paper No. WP/14/4). Retrieved from Central Bank of Barbados website: <http://www.centralbank.org.bb/Portals/0/Files/Developments%20in%20Commercial%20Bank%20Credit%20Distribution.pdf>

McKinnon, R., I. (1973). Money and capital in economic development. Brookings Institution, Washington, DC.

Moore, W., & Craigwell, R. (2002), Market power and interest rate spreads in the Caribbean. *International Review of Applied Economics*, 16(4), 391-405.

Shaw, E., S.. (1973), Financial deepening in economic development. Oxford University Press, New York.

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American economic review*, 71(3), 393-410.

Worrell, D., Doyle-Lowe, M., Belgrave, A. & Guy (2012). A Framework for Interest Rate Policy in Barbados (CBB Working Paper). Retrieved from Central Bank of Barbados website: <http://www.centralbank.org.bb/Portals/0/Files/A%20Framework%20for%20Interest%20Rate%20Policy%20in%20Barbados.pdf>.

VIII. Appendix

Figure 2: Liquidity Indicators (Commercial Banks)

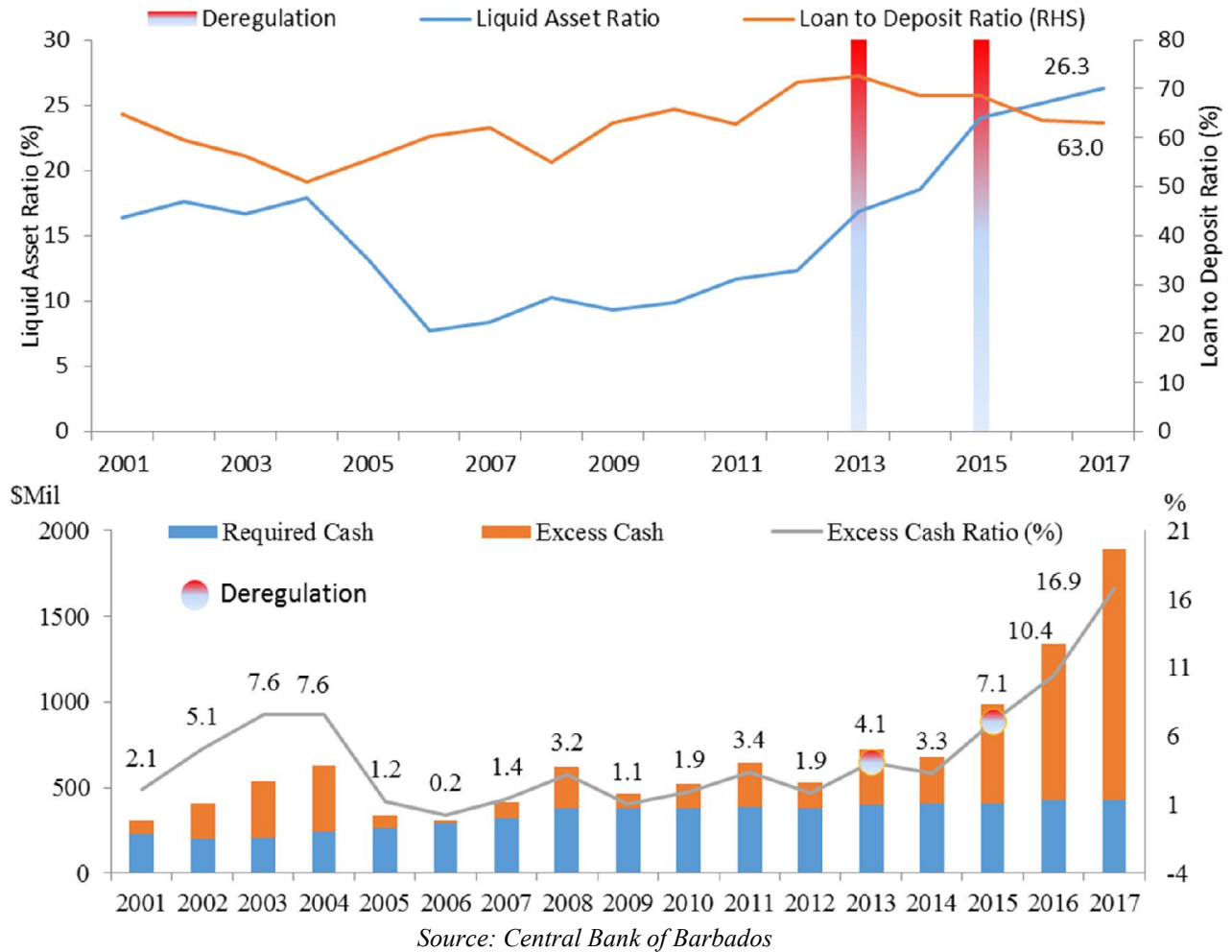
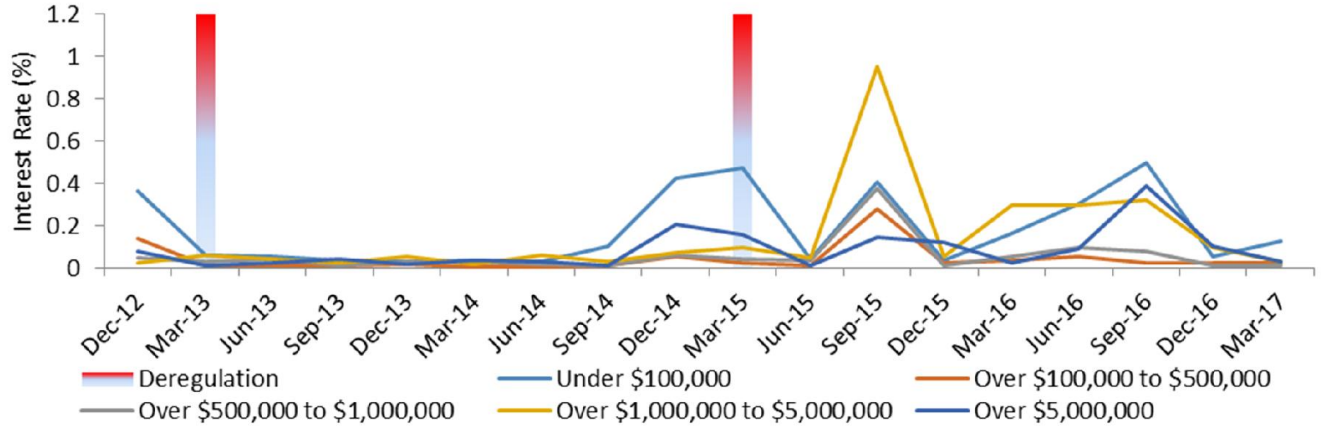


Figure 6: 3- Month Moving Standard Deviation of Lending Rates



Source: Central Bank of Barbados

Figure 9: Time Deposits Interest Rates by Maturity

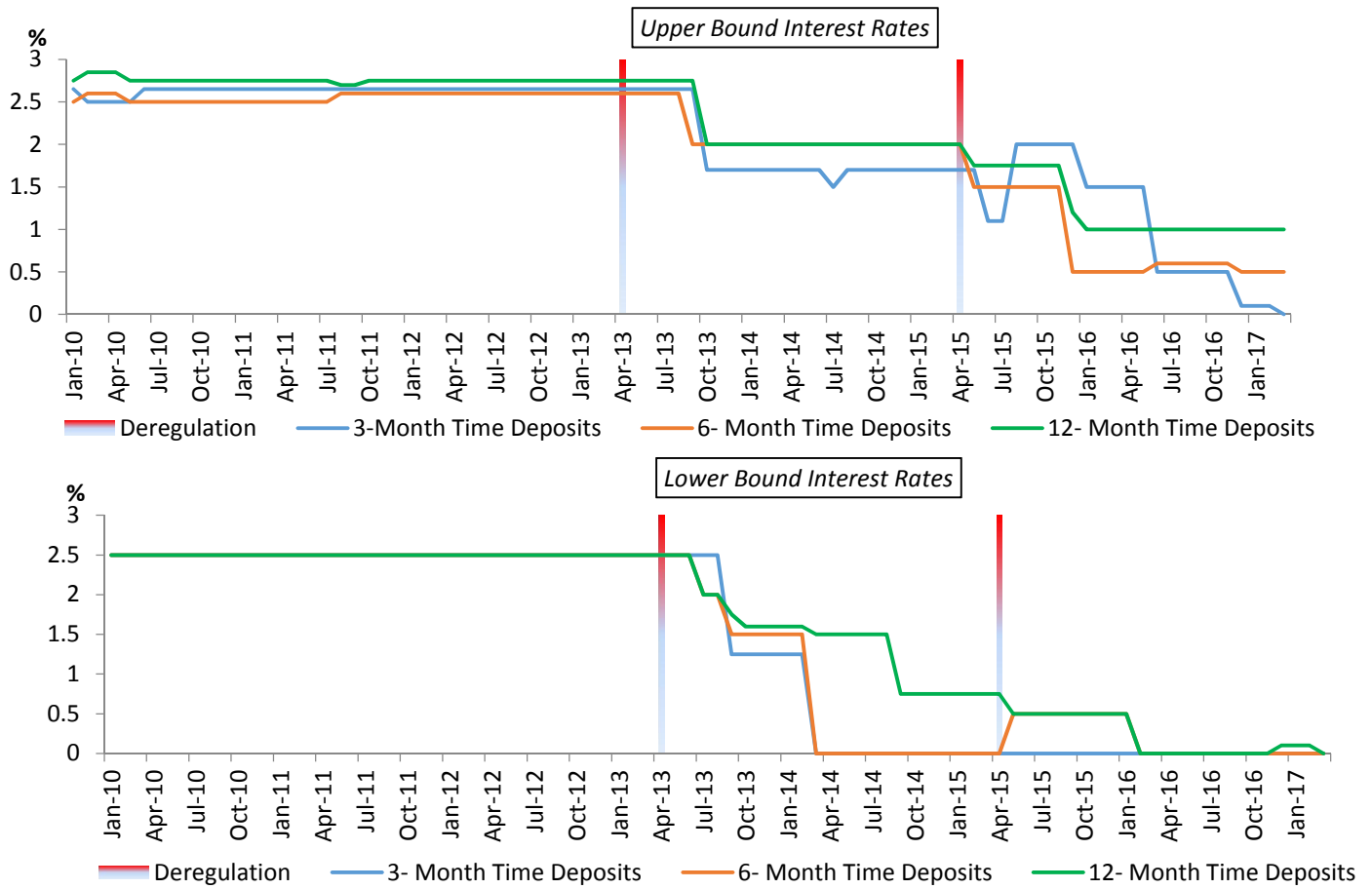
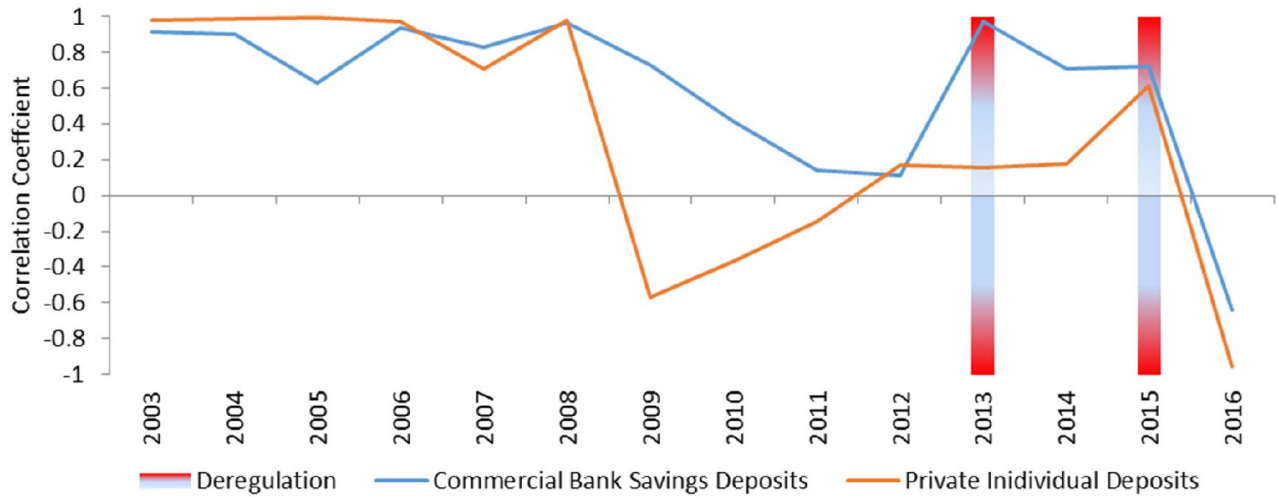
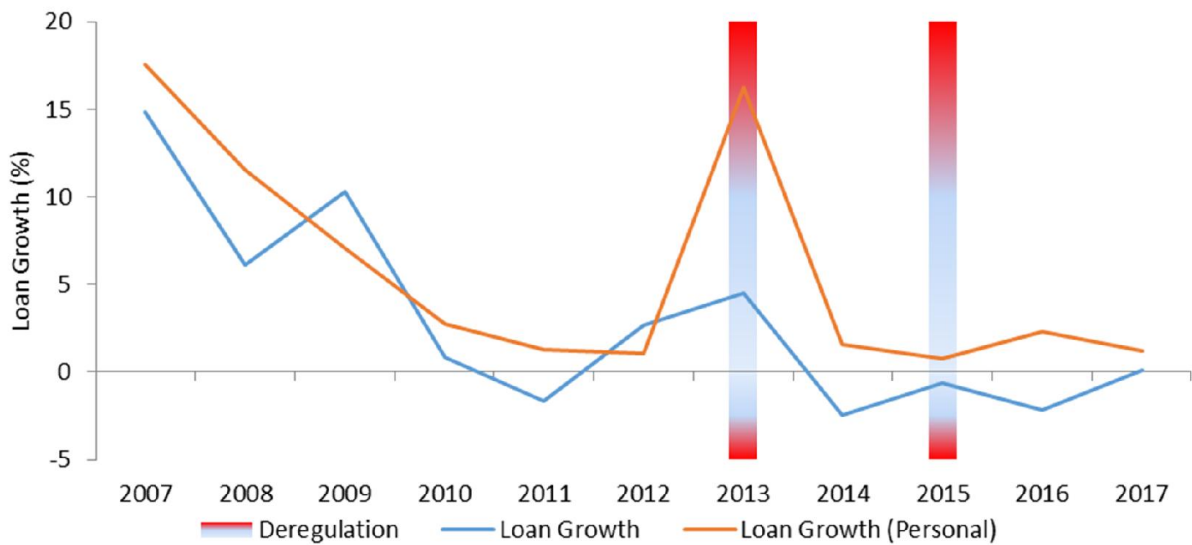


Figure 12: Correlation of Credit Union Deposits with Commercial Bank Deposits



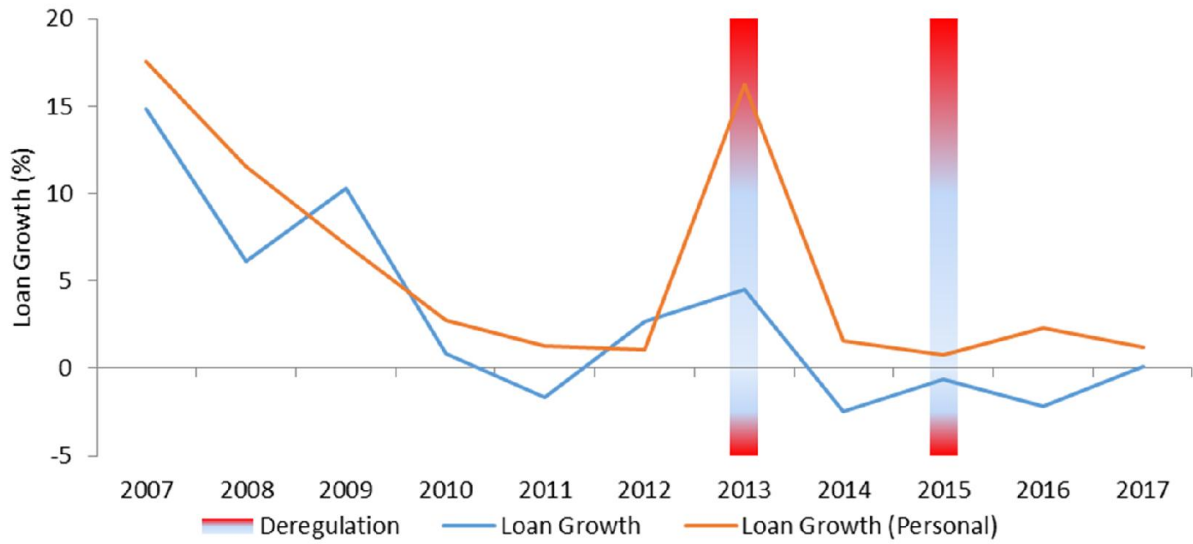
Sources: Central Bank of Barbados and Barbados Financial Services Commission

Figure 13: Commercial Banks' Loan Growth



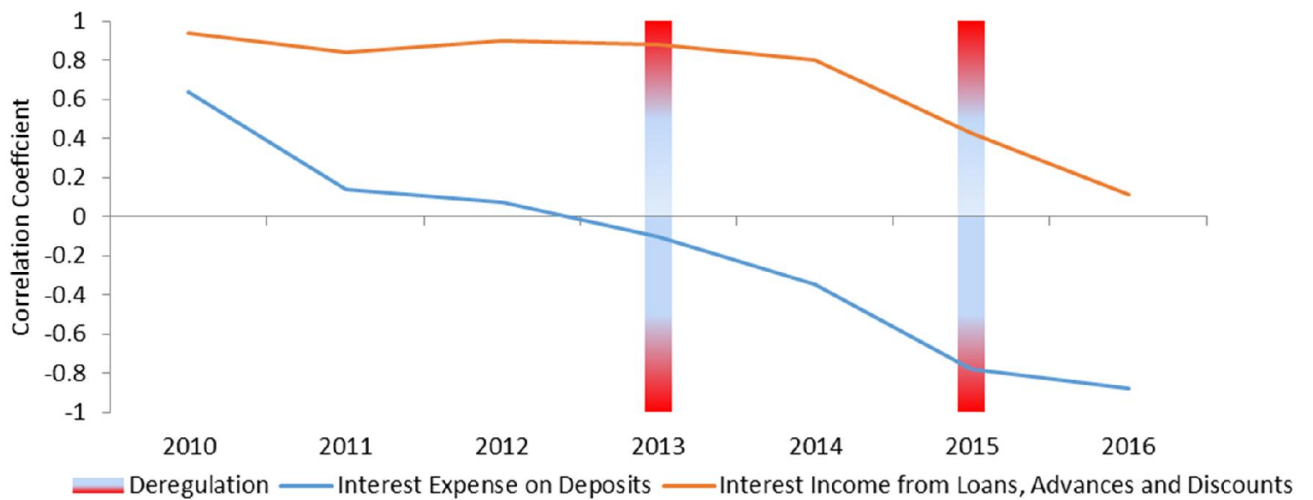
Source: Central Bank of Barbados

Figure 14: Commercial Banks' Return on Assets



Source: Central Bank of Barbados

Figure 15: Incremental Correlations of Net Interest Margin with its' primary components



Source: Central Bank of Barbados