**Financial intermediation and links between credit and productivity in Barbados**

The current program aims to increase productivity in Barbados by inducing higher levels of bank lending to domestic firms (particularly SMEs). The rationale for the intervention emerges mainly from two considerations. First, the financial intermediation in Barbados is at a suboptimal level, and; second, there is a (widely acknowledged) relationship between credit and productivity which is also verified for the particular case of Barbados.

Regarding the first point –the suboptimal levels of financial intermediation-, Worrell and Lowe (2014)[[1]](#footnote-1) note that difficulties in accessing financing are one key factor constraining private sector growth, a point that is further reinforced by Regis (2013)[[2]](#footnote-2) who notes that money and capital markets have not developed the breadth, depth and sophistication that are necessary for facilitating economic growth, while at the same time market capitalization remains low and there is still significant scope for mobilizing household savings. At this point it’s important to note that this situation is not the result of the recent recession[[3]](#footnote-3) but rather is the norm that applies to the credit situation in Barbados. In effect, this point is noted by Craigwell (2010)[[4]](#footnote-4) who uses a Markov-switching model to examine how bank lending behavior differs in a credit or non-credit rationing regimes for Barbados over the period 1974 to 2009. Two particular results emerge Craigwell’s study: (1) analysis of individual sectors reveals that tourism, construction, manufacturing, and agriculture are all credit-rationed under either regime (although the severity of the restriction naturally changes in “bad” times), and; (2) banks are more cautious during periods of uncertainty, particularly during or following recessionary periods. This latter point if further stressed by Bynoe (2010)[[5]](#footnote-5), who notes that as macroeconomic uncertainty in Barbados increases, the dispersion in the level of loans to total assets within the banking sector diminishes (a result that confirms the notion that commercial banks display herding behavior as the level of uncertainty reduces the amount of information available to individual banks). Thus, keeping in mind that the recession that ensued following the 2008 international crisis is one of the four periods of major economic decline in recent years[[6]](#footnote-6) (the others being 1981-1983, 1990-1993, and 2001), it clear that the credit situation has deteriorated beyond the usual level.[[7]](#footnote-7) Furthermore, as noted by Arraiz, Melendez, and Stucchi (2012)[[8]](#footnote-8) Small and Medium Enterprises (SMEs) are particularly vulnerable to the lack of access to credit because information and transaction costs are more acute for these firms.[[9]](#footnote-9) Moreover, SMEs often lack sufficient assets to pledge as collateral. Arriz et al. later indicates that one of the rationales for targeted assistance to SMEs is that access to credit might lead to aggregate growth is by generating long-run gains in aggregate productivity. By lifting constraints on small firms, the pace of entry of new firms, growth of young ones, and exit of unprofitable firms increases leading to a continuous process of resource allocation that generates gains in aggregate productivity via the Schumpeterian “creative destruction” process.[[10]](#footnote-10)

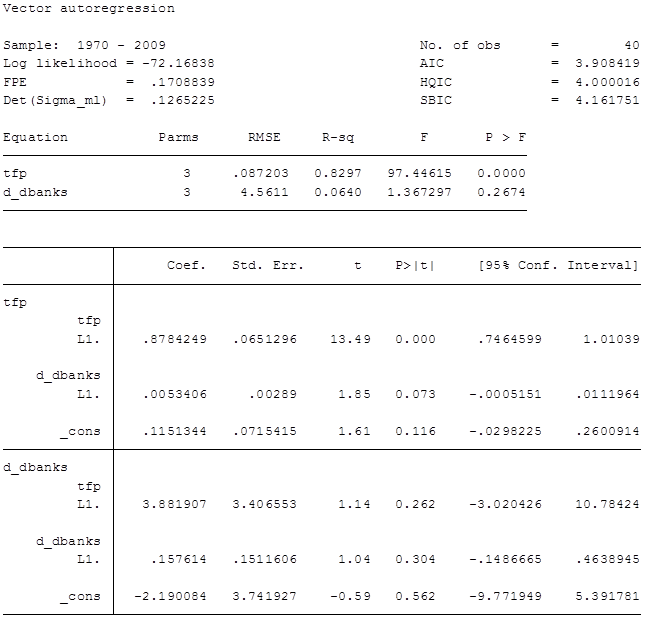
The second point refers that the link between credit and productivity. As mentioned, the causal link running from credit conditions to productivity has been the subject of extensive theoretical and empirical research – which has been in part incorporated in the Support to SMEs and Financial Access/Supervision Sector Framework Document (GN-2768-3). For instance, Beck et al. (2000)[[11]](#footnote-11) show that if the average financial depth in Latin America would increase by to the levels observed in East Asia, productivity growth would increase by 1% reducing in 60% the productivity gap between the two regions. Furthermore, Greenwood et al. (2013)[[12]](#footnote-12) estimate that if Latin American countries reach the level of financial development of Luxembourg productivity would increase by 17% and GDP by 85%. A similar exercise is made by Arizala et al. (2013)[[13]](#footnote-13) but regarding industries (the main result is that TFP would accelerate by 0.6% following an increase of one standard deviation in financial depth). Although there are several other works that find similar results, at this point is relevant to note that these results also apply to Barbados. In effect, McKensie and Craigwell (2012)[[14]](#footnote-14) estimate an investment model with traded and non-traded sectors for Barbados. Their model accounts for 69%-99% of the total variation observed in sector-specific investments, and finds that investment in both sectors in the long-run are positively affected by private credit. This result is also present in the short-run but the impacts are higher than in the previous case (it is worth noting that the estimations also find a negative relationship between investment in both sectors and interest rates). Following in this line, several works have found that financial development has a positive effect on growth in Barbados. Wood (1993)[[15]](#footnote-15) finds evidence of the relationship for the period 1968-1990; Craigwell, Downes, and Howard (2001)[[16]](#footnote-16) follow a VAR approach and find that financial development causes growth, and Iyare and Moore (2009)[[17]](#footnote-17) with a similar approach (VECM) also find that financial development causes growth in Barbados; finally, Lorde and Osarentin (2004)[[18]](#footnote-18) also find that financial development causes GDP growth in the island (in this case causation is in the Granger sense). These results are complemented by others that indicate that TFP accounts (depending on the estimation and the sample) from 20% up to 68% of observed growth in Barbados. For instance, the World Bank (1994)[[19]](#footnote-19) undertakes a cross-country analysis of economic growth of Caribbean countries (including Barbados), covering the period 1979-1990 and concludes that factor accumulation (capital and labor) explain 32% of real GDP growth, while total factor productivity growth accounted for 68% of observed growth rates; a similar exercise by the CBB is reported in Downes (2002)[[20]](#footnote-20) indicating that growth accounting over the 1963 to 1993 period found that the TFP explained 50% of the observed growth (capital accounted for 31% of real GDP growth, and labor 19%), and when the labor was adjusted to consider human capital TFP still accounted for a significant 20% of observed growth rates for the period.

Finally, in order to further assess the link between credit and productivity, we estimated a VAR system of the relationship between TFP and bank credit in Barbados. Using data spanning from 1970 to 2009, a VAR of TFP and changes in bank credit indicates that we cannot reject the hypothesis that bank credit Granger causes TFP in Barbados (we can reject that TFP granger cause changes in bank credit).[[21]](#footnote-21)

**Annex – Estimation results**

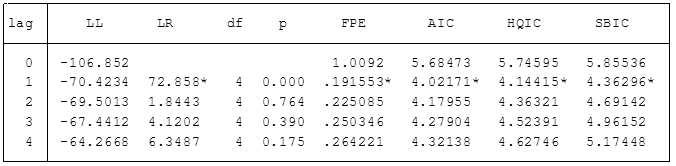
**Table 1**

**VAR – TFP and Bank credit in Barbados**

****

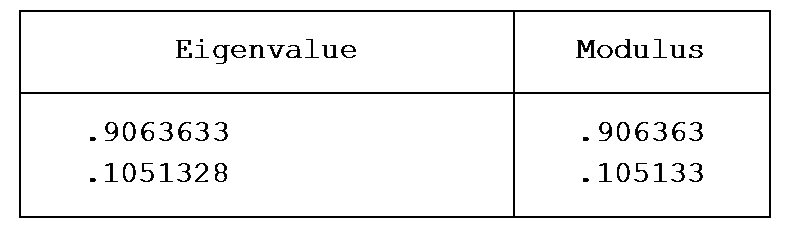
**Table 2**

**Lag selection**

****

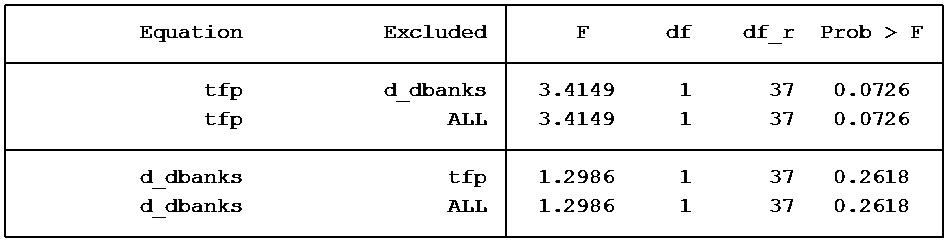
**Table 3**

**Eigenvalue Stability Condition**

****

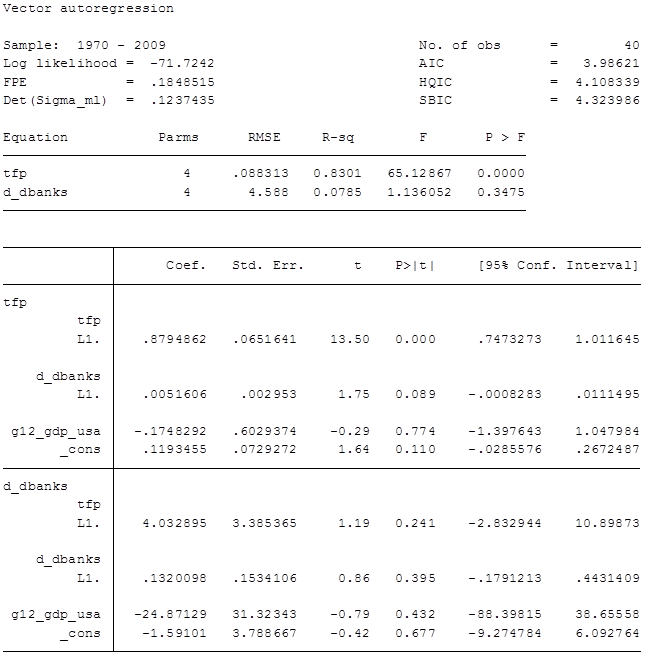
**Table 4**

**Granger causality**

****

**Table 5**

**VAR – augmented specification with USA GDP growth as an exogenous variable**



1. CBB Working Paper #14/1 [↑](#footnote-ref-1)
2. CBB Working Paper #13/11 [↑](#footnote-ref-2)
3. Although as it is noted later on, the recent recession certainly compounds the problem. [↑](#footnote-ref-3)
4. Craigwell, R. 2010. Lending behavior and credit rationing in Barbados: a regime switching model. CBB. [↑](#footnote-ref-4)
5. Bynoe, R. 2010, The impact of macroeconomic risk on commercial bank lending behavior in Barbados, CBB. [↑](#footnote-ref-5)
6. CBB Working Paper #14/2 [↑](#footnote-ref-6)
7. Again, it’s worth noting that the current recessionary situation is not the root of the suboptimal financial situation but it certainly adds to the problem. [↑](#footnote-ref-7)
8. Arraiz, I., Melendez, M, and Stucchi, R., 2012, Evidence from the Colombian National Guarantee Fund, Working Paper OVE/WP-02-12, IADB. [↑](#footnote-ref-8)
9. Several factors come into play. Some of these are: (i) SMEs have a lower survival rate; (ii) SMEs face proportionally greater scrutiny and proportionally larger appraisal and monitoring costs; and (iii) SMEs are also proportionally more expensive to deal with in the event of a default. [↑](#footnote-ref-9)
10. By acting as guarantor of a fraction of the loan, the government is able to lift the credit constraint of SMEs that otherwise would have been unable to access the credit market. By outsourcing the origination and servicing of loans to for profit intermediaries, the government increases the efficiency of the operation and by guaranteeing the loan only partially it assures that the lender retains some risk so it has an incentive to conduct an accurate credit appraisal (see Arraiz et al. 2012). [↑](#footnote-ref-10)
11. Beck, T, Levine, R and Loayza, N. Finance and the sources of growth, Journal of Financial Economics, 2000, 58, 261-300. [↑](#footnote-ref-11)
12. Greenwood, J, Sanchez, J.M., and Wang, C. Quantifying the impact of financial development on economic development, Review of Economic Dynamics, 2013, 16, 194-215. [↑](#footnote-ref-12)
13. Arizala, F, Cavallo, E, and Galindo A., Financial development and TFP growth: cross-country and industry-level evidence, IADB, 2009. [↑](#footnote-ref-13)
14. McKenzie, S. and R. Craigwell, Determinants of investments in the traded and non-traded sectors in Barbados, CBB, 2012. [↑](#footnote-ref-14)
15. Wood, A. (1993). Financial Development and Economic Growth in Barbados: Causal Evidence. Savings and Development, 4, 379-390. [↑](#footnote-ref-15)
16. Craigwell, R., Downes, D., & Howard, M. (2001). The Finance-Growth Nexus: A Multivariate VAR Analysis of a Small Open Economy. Savings and Development, 2, 209-223. [↑](#footnote-ref-16)
17. Iyare, S., & Moore, W. (2011). Financial Sector Development and Growth in Small Open Economies. Applied Economies, 43, 1289-1297. [↑](#footnote-ref-17)
18. Lorde, T., & Osaretin, I. (2004). The Importance of Financial Sector Reform: Development and Efficiency in Caribbean Banking. XXXVIth Annual Monetary Studies Conference . Trinidad and Tobago: Caribbean Centre for Money and Finance. [↑](#footnote-ref-18)
19. World Bank (1994). Coping with Changes in the External Environment (Report No 12821 LAC, Washington, D.C.). [↑](#footnote-ref-19)
20. Downes, A. 2002. Economic Growth in a small developing country: the case of Barbados. GDN/IDB/LACEA project on Economic Growth in Latin America and the Caribbean. [↑](#footnote-ref-20)
21. Data spans from 1970 to 2009. Bank credit refers to bank credit relative to GDP. Unit root test suggest that the TFP series can be considered stationary while bank credit requires differentiation to achieve stationarity. The number of lags is set to 1 in accordance with the unanimous selection fallowing AIC, SIC, LR, FPE, and other tests conducted. Furthermore, all the eigenvalues lie inside the unit circle and therefor the VAR satisfies stability condition. As a robustness check, the VAR was estimated with GDP growth for the United States as an exogenous variable (confirming all previous results). It is worth noting that the estimations were carried-out accounting adjusting by small sample. [↑](#footnote-ref-21)