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Barbados

Enhanced Access to Credit for Productivity Program

(BA-L1034)

Cost-Benefit Analysis

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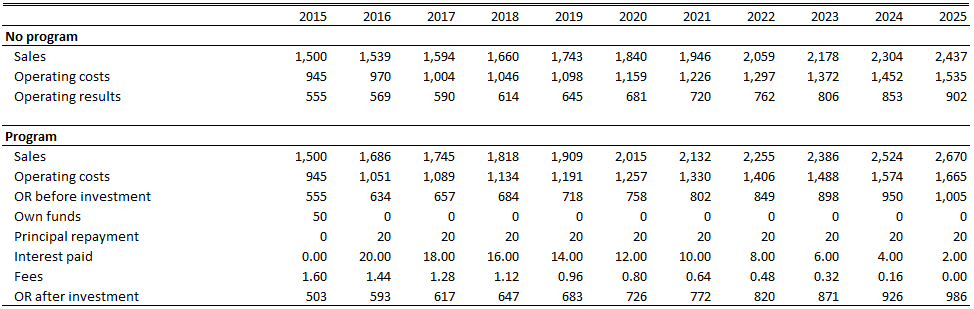
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1. Introduction
2. A. Intervention rationale
   1. Credit and productivity[[1]](#footnote-1)
      1. General framework outline
   2. The current program aims to contribute to increase productivity of SMEs by facilitating access to medium- and long-term credit for investment projects. In particular the program will benefit SMEs to access credit, through the provision of partial credit guarantees to IFIs, for medium and long term capital investments that allow the SMEs to modernize and reconvert their businesses. The Program will have a single component of US$35 million[[2]](#footnote-2) to provide the financing to support the establishment and capitalization of a partial credit Guarantee Fund, to be managed by the Central Bank of Barbados (CBB).
   3. 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.
      1. Intermediation in Barbados
   4. Regarding the first point –the suboptimal levels of financial intermediation-, Worrell and Lowe (2014)[[3]](#footnote-3) note that difficulties in accessing financing are one key factor constraining private sector growth, a point that is further reinforced by Regis (2013)[[4]](#footnote-4) 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[[5]](#footnote-5) but rather is the norm that applies to the credit situation in Barbados. In effect, this point is noted by Craigwell (2010)[[6]](#footnote-6) 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[[7]](#footnote-7) (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.
   5. This latter point if further stressed by Bynoe (2010)[[8]](#footnote-8), 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[[9]](#footnote-9) (the others being 1981-1983, 1990-1993, and 2001), it clear that the credit situation has deteriorated beyond the usual level.[[10]](#footnote-10) Furthermore, as noted by Arraiz, Melendez, and Stucchi (2012)[[11]](#footnote-11) 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.[[12]](#footnote-12)
   6. As presented in more detail in the program’s [Project Profile](http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=38659670) and in the [analysis of market demand for partial credit guarantee](http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=38995189), SMEs, in particular, 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.[[13]](#footnote-13)
      1. Linkages between credit and productivity: some noted references
   7. 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)[[14]](#footnote-14) 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)[[15]](#footnote-15) 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)[[16]](#footnote-16) but regarding industries (the main result is that TFP would accelerate by 0.6% following an increase of one standard deviation in financial depth).
      1. Linkages between credit and productivity: the case in Barbados
   8. Although there are several other works that find similar results that can be added to ¶3, at this point is relevant to note that these results also apply to Barbados. In effect, McKensie and Craigwell (2012)[[17]](#footnote-17) 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)[[18]](#footnote-18) finds evidence of the relationship for the period 1968-1990; Craigwell, Downes, and Howard (2001)[[19]](#footnote-19) follow a VAR approach and find that financial development causes growth, and Iyare and Moore (2009)[[20]](#footnote-20) with a similar approach (VECM) also find that financial development causes growth in Barbados; finally, Lorde and Osarentin (2004)[[21]](#footnote-21) 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)[[22]](#footnote-22) 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)[[23]](#footnote-23) 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.
   9. Finally, in order to further assess the link between credit and productivity, IFD/CMF estimated a VAR system of the relationship between TFP and bank credit in Barbados (see footnote 1). Using data spanning from 1970 to 2009, a VAR of TFP and changes in bank credit indicates that the hypothesis that bank credit Granger causes TFP in Barbados cannot rejected (although it can be rejected that TFP granger cause changes in bank credit).[[24]](#footnote-24)
   10. Rationale for credit guarantees
   11. As discussed (see section 1), access to finances is consistently identified as an important restriction affecting firms in Barbados –and the LAC region in general (Enterprise Survey 2010). Credit restrictions are particularly severe for new firms –which have neither experience nor collateral (Hanley and Girma, 2006)- and for SMEs (typically lacking sufficient financial information and accounting records). SMEs that have managed to remain in the market tend to have high growth potential but this growth is usually restricted by limited access to external finance (Baas and Schrooten, 2006; Oliveira & Fortunato,2006). A government backed guarantee scheme may help SMEs to overcome collateral constraints and increase the total credit flowing to productive firms (Gudger, 1998). Credit guarantees can partially compensate for the negative effect of asymmetric information and be an effective mean of supporting the start-up, growth, and survival of new and risky enterprises (Riding & Haines Jr., 2001).
   12. One aspect that can reduce the expected benefits and/or increase the costs of a credit guarantee scheme is the potential introduction of incremental distortions to the market selection process (screening) of loan applicants –and as a result, further reduce the efficiency of the credit allocation process. This can manifest in higher-than-average failures within firms receiving credit due to government support (Santarelli and Vivarelli, 2002), or maintaining in the marketplace firms that should otherwise stop operating (Kiyota and Okazaki, 2005).
       1. Effects of guarantees in the quantity and distribution of credit
   13. From a theoretical perspective, a public credit guarantee scheme can affect both the distribution and the amount of lending provided by participating financial institutions. In term of distribution, an unconditional guarantee would change the relevant risk-return faced by the financial institutions providing the loan inducing a reallocation of lending towards activities with relatively high private returns and high social risks. In addition to this effect, a credit guarantee scheme of those characteristics would also induce financial institutions to involve a transfer of risk from their balance sheets to credit guarantee fund and, as a result of this they would have incentive to increase their overall level of lending.[[25]](#footnote-25)
   14. Since government back credit guarantee schemes typically are not unconditional guarantees but have a series of conditions attached to them in order to prevent the reallocation of credit and to favor additionality it is expected the substantive contribution of the program would emerge as additional credit lines extended to the target firms. The contribution of credit guarantees schemes is by its nature difficult to quantify and in itself subject to a high degree of variability conditional on factors such as the legal framework, the general economic conditions, credit conditions, and the design and conditionalities of the credit guarantees –among other factors.
   15. The literature on government sponsored credit guarantee schemes targeted to SMEs has found additionality rates can range from almost 0% or quite difficult to detect (IADB, 2006), 12.4% (Zecchini and Ventura, 2009), 14% new clients (Larrain and Quiroz, 2006), 25-33% (Gale, 1991), and 37% (Boocok and Sharif, 2005).[[26]](#footnote-26) The wider variation in the estimated additionality from government-backed credit guarantees can result from various factors: a. different nature of the schemes; b. different institutional factors; c. different stochastic properties of the variables under consideration during the particular periods of analysis, and; d. different windows of analysis among other factors. Of these factors, it’s important to keep in mind the potential effects of the last two. In particular, the presence of unobserved shocks can affect the estimations, and the period over which additionality is considered.[[27]](#footnote-27)
       1. Effects of the guarantee on growth
   16. The effects of the guarantee on productivity and growth would be mediated by its impact on credit growth –which has already been shown to impact growth and productivity. Here it is worth noting once again the range of magnitudes identified in the literature: a. Beck, Levine and Loayza (2000) estimate that increasing the level of credit relative to GDP from 20% to 25% would accelerate productivity growth by 0.3% to 0.5% per year;[[28]](#footnote-28) b. Arizala, Cavallo, and Galindo (2009) find that a one standard deviation increase in financial development can accelerate TFP growth up to 0.6% per year (depending on the external finance requirement of industries); c. Angelini and Generale (2008) estimate the effects of financial constraints on firm size and find that, on average, the presence of financial constraints reduce firm growth by 0.8%. d. Beck et al. (2000) try to estimate causal effects of financial development on growth relying on instrumental variable and GMM regressions[[29]](#footnote-29) and the results indicate that an exogenous 10% increase in the ratio of private credit to GDP can induce an acceleration of the per capita growth rate in the order of 0.24-0.32 percentage-point. Turning to more directly related measures, Arraiz et al. (2014) have estimated that the impact of the increased credit access resulting from a government backed credit guarantee program has been about 6% (treated vs untreated firms). This number is quite similar to the results obtained from the Enterprise Survey (a central source of information in Barbados, given the limited availability from other sources); using data from the Enterprise Survey 2010 (Barbados) shows that firms that obtained a loan expanded sales by 6.9% more relative to those that did not obtain one. Thus, keeping in mind the results from the literature and following a very conservative approach, we will use here the assumption that firms obtaining access to bank financing manage to expand productivity by 6.9% above those that did not get a loan.[[30]](#footnote-30)
3. Assumptions and parameters
4. A. General assumptions and considerations
   1. In order to compute the potential benefit from the guarantee, measured as increased GDP[[31]](#footnote-31),[[32]](#footnote-32), it is necessary to make a series of assumptions and projections regarding the behavior of the economy, the operation of the guarantee, the banking system, and the relationship between private and social valuations.
   2. The present CBA considers as the relevant timeframe the period between 2015 and 2029. This period emerges from the start of the program until the expected conclusion of the investment cycle for the projects started with the last tranche of the program. Furthermore, it considers the impact of the guarantees provided under the strict conditions of disbursements which contributes to maintain the principle of prudence when imputing flows in a CBA. In following this approach, it should be clear that we are assuming that all the agents involved (firms, banks) are following rational, profit-maximizing behavior evaluating their private costs and benefits. Under the additional assumption that this private costs and benefits match social costs and benefits on average, then the measured increased GDP is an adequate measure of the social net benefit of the operation.[[33]](#footnote-33)
   3. Given the lack of detailed statistic information on Small and Medium Enterprises (SMEs) in Barbados, the analysis has considered a combination of information and evidence, including: (i) a survey with local financial institutions and SMEs undertaken in preparation to this project; (ii) the analysis data from the World Bank’s Enterprises Survey for Barbados for 2010; (iii) a study and data base of manufacturing firms from the Sir Arthur Lewis Institute of Social and Economic Studies (SALISES); (iv) Central Bank of Barbados Statistics for 2014; (v) and Barbados 2010 Census. As Barbados does not have a formal definition of SMEs, for the purposes of this Program SMEs will be defined according to the IDB/IIC default definition for C and D countries.
5. B. Particular parameters and assumptions[[34]](#footnote-34)
   1. Firms parameters
   2. From the interviews with the financial intermediaries and other stakeholders[[35]](#footnote-35) it emerged that the expected (typical) profile for firms benefiting from the guarantee scheme would consist of firms with sales of around BD$3,000,000 (US$1,500,000) asking for a loan of about BD$400,000 (US$ 200,000)[[36]](#footnote-36). Using information from the Enterprise Surveys (2010) it is possible to characterize further this typical firm. In particular, it results that operating (variable) costs would stand at around BD$1,890,000 (US$945,000). Moreover, as noted in the previous section, data from the Enterprise Surveys (2010) indicates that firms with credit advanced the value of their sales about 6.9% more than the 2.7% for firms without credit (between 2007 and 2008, periods preceding the survey used for the calculation). Furthermore, from a survey of manufacturers conducted in 2009 (SALISES, 2009[[37]](#footnote-37)), the distribution of use of credit indicates that about 19% is directed towards recoverable assets (machines and physical expansions).[[38]](#footnote-38) Finally, again from the information collected from the financial intermediaries during the series of interviews and surveys conducted and collected in preparation for this program, it emerged that loans typically perform well for 2-3 years before the emergence of repayment problems, and based on this we will assume that the operation of the project stops at the third year (for the projects that fail).[[39]](#footnote-39)
   3. Macroeconomic environment and NPLs
   4. For the projection over time of growth rates and prices we consider the projections of the IMF for Barbados. For the projection of the ratio of NPLs in the system we take the information from the CBB, to which we add the assumption that the current level will decline at a given rate of 100bp per year until it reaches 2% (the evolution of NPL is varied during the sensibility analysis). Furthermore, anticipating the possibility that the scheme induces lower screening and monitoring efforts from the financial intermediaries we assume that the rate of NPLs for loans under the scheme are 20% higher than the observed average for the system.
   5. Interest rates, fees, loan length, coverage, internal funding, recovery
   6. The average expected rate for loans under the scheme is 10%; fees for the guarantee are expected to be 1% of the outstanding coverage; the length of the loan under the guarantee is set at 10 year; the loan is expected to cover 80% of the project financing needs (20% comes from internal funding); the government covers 80% of the loan, and (based on information provided by the CBB), the expected recovery rate is 20%.
   7. Other relevant variables
   8. Other relevant parameters not covered in the previous sections are: a. the IADB disburses US$35 million in 5 years (15%, 15%, 20%, 25%, and 25% in each respective year); b. the interest on the principal outstanding is 2.53%; c. in addition to fees and recoveries, the fund will earn interest on idle funds (at a rate of 1% according to information provided by the CBB); d. operational costs are expected to be US$10,500 per month.[[40]](#footnote-40)
6. Results
   1. Under the conditions described above it is possible to compute the additional GDP (value added) generated by the presence of the guarantee over the period 2015-2029 (see ¶2.2). To begin with, we note that under the above assumptions, the fund’s operating costs are not covered every year by fees, interest, and recoveries; since this subsidy is not registered in the private measure of added value that amount is detracted from the former (hence, the reported change in value added is net of all costs). Table III.A.1 presents the corresponding inflows and outflows of the typical firm expected to benefit from the guarantee (see ¶2.3) which constitutes the basis for the calculation of the change in aggregate value added (GDP) as a result of the program. Table III.A.2 then follows with the aggregated results for the economy (aggregation of individual changes in value added net of other resources not captured by private costs as just discussed).
   2. It should be pointed out that the calculations in this annex are already accounting for increased use of inputs, productivity gains, and marginal changes in operating costs. Moreover, the impact is measured as the change in net benefits (of which the change in sales due to change in inputs and productivity and the cost reductions obviously play a role).

Table III.A.1

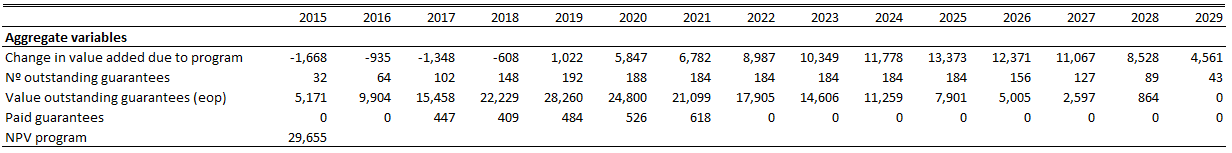
Central scenario – typical firm



Note: values in thousands of US dollars

Table III.A.2

Central scenario – aggregate results



Note: values in thousands of US dollars

* 1. As can be seen from tables III.A.1 and (particularly) III.A.2, the program is expected to generate a positive NPV of US$29.7 million over the period under consideration in the central scenario. The following section considers a series of sensibilization exercises in order to assess the risk imposed by potential deviation of key variables from their expected path.

1. Sensitivity Analysis
   1. This section explores how the results of the preceding analysis changes when varying the path of key underlying parameters and assumptions. This is an important exercise to explore the robustness and sensitivity of the results to changes in the underlying environment and conditions. We consider the following sensibilizations:
      1. Changes in productivity gains
      2. Changes in variable costs savings
      3. Changes in the expected path of NPLs
      4. Changes in the underlying conditions of the economy (GDP growth)
      5. Combined changes in productivity and cost savings.
   2. **Productivity gains.** The central scenario considers productivity gains of 6.9% (see ¶1.12). Tables IV.A.1-IV.A.2 to tables IV.C.1-IV.C.2 present the results of assuming reductions in productivity gains of 10%, 25%, and 50% respectively, and table IV.D.1 and IV.D.2 present the results of a reduction of the expected productivity gain of 67,6% (equivalent to a gain of just 2.2%) which is the value for which the NPV reaches zero (productivity break-even point). As it can be seen, the NPV of the program remains positive for substantially lower than expected productivity gains emerging from the increased availability of credit.
   3. **Changes in variable costs**. The central scenario considers a decrease in variable costs as a consequence of the investment in newer equipment, adoption of better technologies, and improvements in processes of 1%. Tables IV.E.1, IV.E.2, IV.F.1, and IV.F.2 present the results assuming that this savings halve and disappear entirely. As, this result shows, the results of the central scenario do not hinge on this assumption.
   4. **Changes in the expected evolution of NPLs**. One important variable driving the results in this analysis is the underlying evolution of NPLs in the financial system. To account for the potential effects, the analysis assumes two scenarios with increases of 50% and 100% of NPLs. This is to say that, for instance, in a given year the underlying NPLs rate in the system is 3%, the sensibilizations assume that it rises to 4.5% and 6% respectively (and this displacement applies to the entire path over the period 2015-2029). As we can see the NPV for the program holds well in these scenarios (see tables IV.G.1, IV.G.2, IV.H.1, and IV.H.2). Since this is clearly an important variable, it begs the question of why such relatively minor impact. The answer lies on: a. the typical profile of a default; b. the profile of disbursements, and; c. the discount rate. In effect, following the indications of the financial institutions interviewed in preparation of the program it emerged that, typically, firms remain in good standing for 2 to 3 year before they fall behind (that is, for those firms that do); furthermore, the current profile of disbursements in the IADB line is so that only 30% of the new guarantees are place in the first two years, and 50% in the last 2 once the NPLs rate in the system has fallen in any scenario under consideration –thus, as a result, the peak of paid guarantees is reached in 2021. Then, considering that the negative effects of these defaults have to be weighted by the corresponding discount factor, it results that the impact is relatively lower than what intuition may suggest.
   5. **Changes in the underlying conditions in the economy**. Finally, we consider a situation in which the expansion of the economy (real growth rate) halves and one in which there is no real growth over the period under consideration. The results can be seen in tables IV.I.1, IV.I.2, IV.J.1, and IV.J.2). As can be seen, the results indicate that the program remains with at positive NPV. Again, it is worth discussing the reason for this result which appears to counter intuition. The reason for this is that the key underlying factor driving the evolution of the NPV emerging from the program is the productivity gains that it induces. This productivity gains remain in place in this scenarios (and it is worth repeating that tables IV.A.1 to IV.D.2 already consider the cases where there are significant reductions in them).
   6. **Stress scenario**. The tables IV.K.1 and IV.K.2 present the result of the combination of two scenarios –namely, the case with no reduction in operating costs couple with a much lower (-50%) than expected productivity gains. As can be seen in the tables, in this case the NPV for the program turns negative.
   7. **Summary sensitivity analysis**. The following table summarizes the results from the sensitivity analysis, relative to the central scenario in which the aggregate NPV is US$29.67 million over a period. This analysis indicates that the biggest risks lie on lower than expected productivity gains, which can be compounded by lower than expected reduction in costs, and lower than expected GDP growth (likely to be accompanied by higher than expected NPLs). Overall, the NPV remains positive for a reasonable range of assumptions and scenarios

**Sensitivity analysis – summary**



Note: values in thousands of US dollars

**Sensitivity analysis – evolution of the per-period increased value added under multiple scenarios**



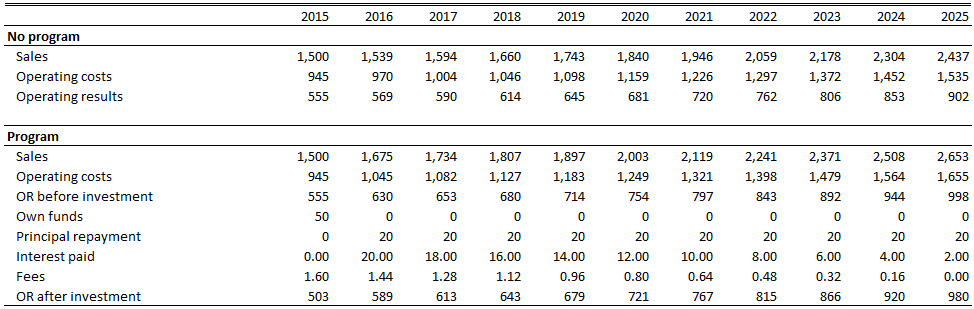
Note: values in thousands of US dollars

1. Conclusions
   1. The present analysis indicates that the program generates positive NPV for a wide range of possible variations in the underlying parameters and under very conservative assumptions. Therefore, considering the results of the preceding sections we recommend the program to be implemented.

Annex – sensitivity analysis

Table IV.A.1

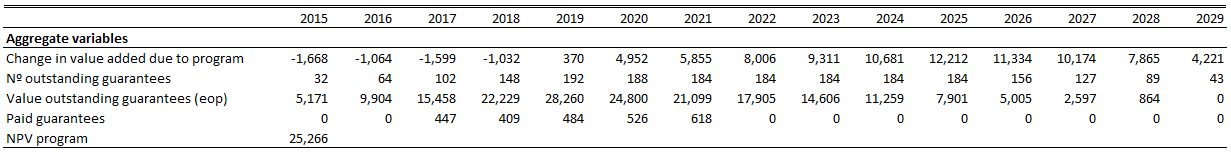
Sensitivity analysis – typical firm - 10% lower productivity gains



Note: values in thousands of US dollars

Table IV.A.2

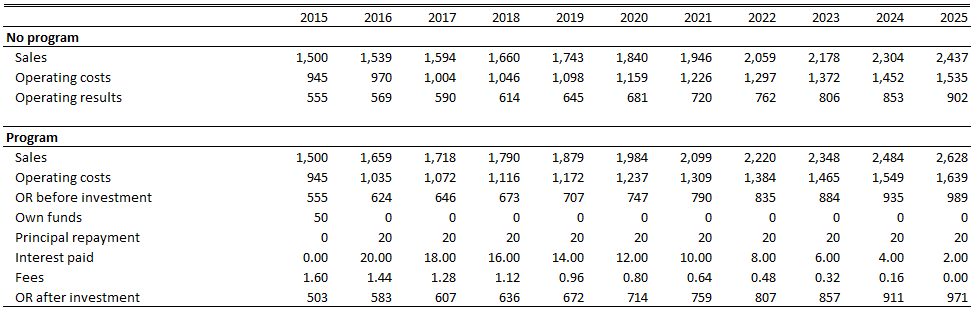
Sensitivity analysis – aggregate results - 10% lower productivity gains



Note: values in thousands of US dollars

Table IV.B.1

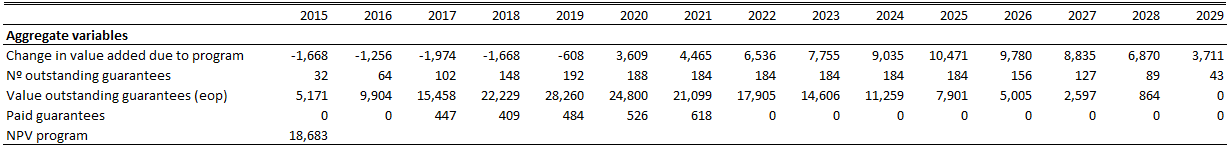
Sensitivity analysis – typical firm - 25% lower productivity gains



Note: values in thousands of US dollars

Table IV.B.2

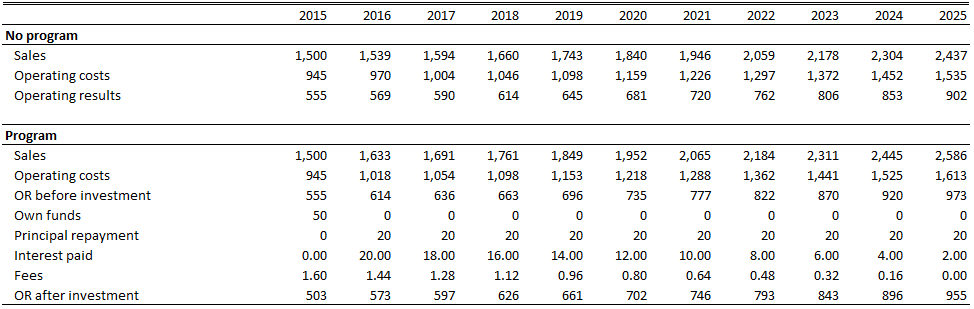
Sensitivity analysis – aggregate results - 25% lower productivity gains



Note: values in thousands of US dollars

Table IV.C.1

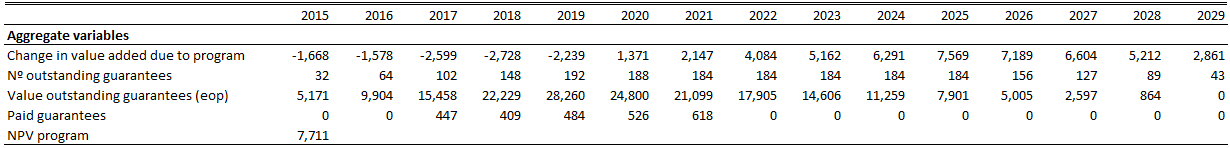
Sensitivity analysis – typical firm - 50% lower productivity gains



Note: values in thousands of US dollars

Table IV.C.2

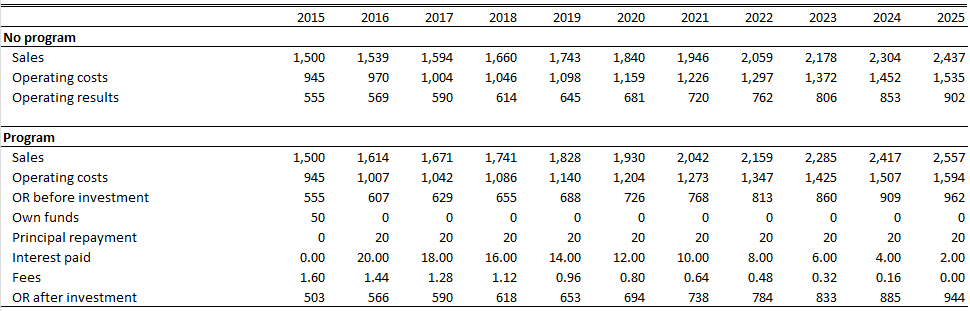
Sensitivity analysis – aggregate results - 50% lower productivity gains



Note: values in thousands of US dollars

Table IV.D.1

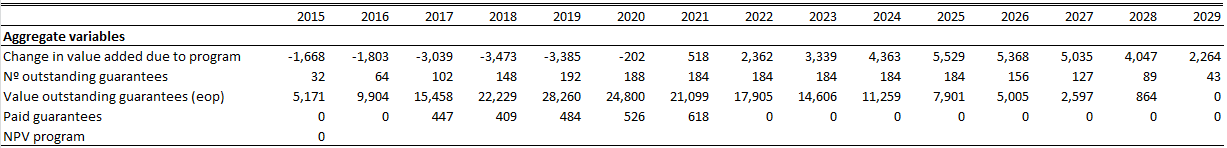
Sensitivity analysis – typical firm – 67.6% lower productivity gains



Note: values in thousands of US dollars

Table IV.D.2

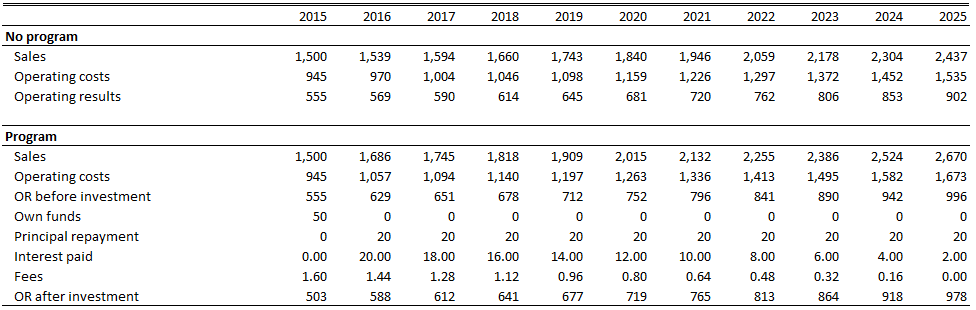
Sensitivity analysis – aggregate results – 67.6% lower productivity gains



Note: values in thousands of US dollars

Table IV.E.1

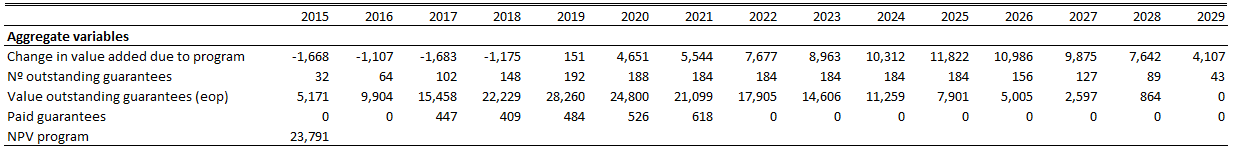
Sensitivity analysis – typical firm - 50% lower reduction in variable costs



Note: values in thousands of US dollars

Table IV.E.2

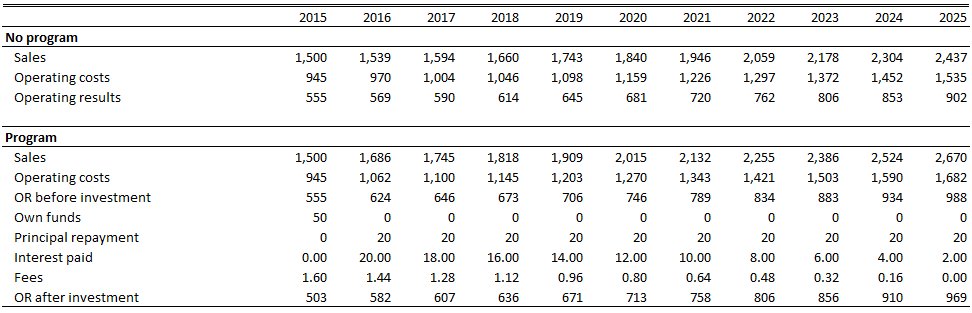
Sensitivity analysis – aggregate results - 50% lower reduction in variable costs



Note: values in thousands of US dollars

Table IV.F.1

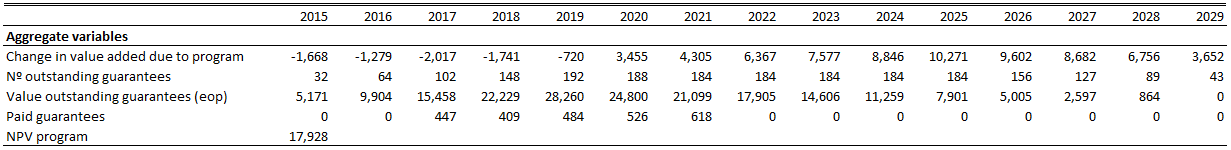
Sensitivity analysis – typical firm - no reduction in variable costs



Note: values in thousands of US dollars

Table IV.F.2

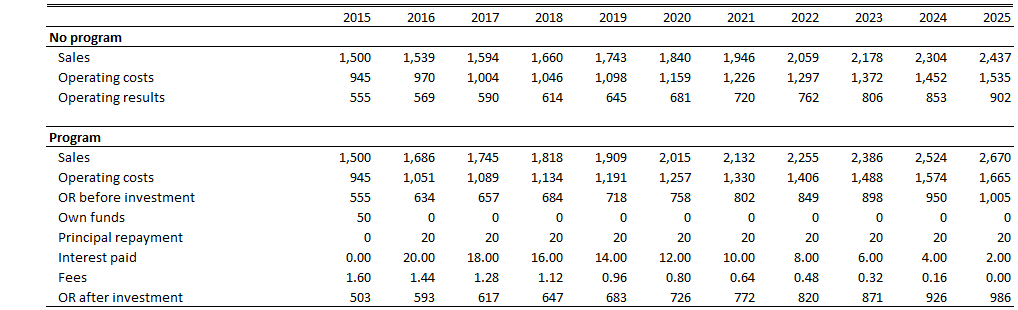
Sensitivity analysis – aggregate results - no reduction in variable costs



Note: values in thousands of US dollars

Table IV.G.1

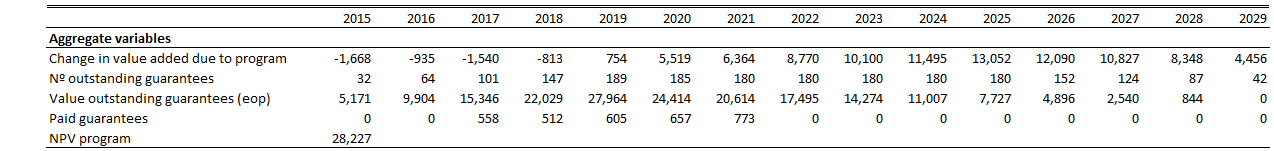
Sensitivity analysis – typical firm – 50% increase in system NPLs



Note: values in thousands of US dollars

Table IV.G.2

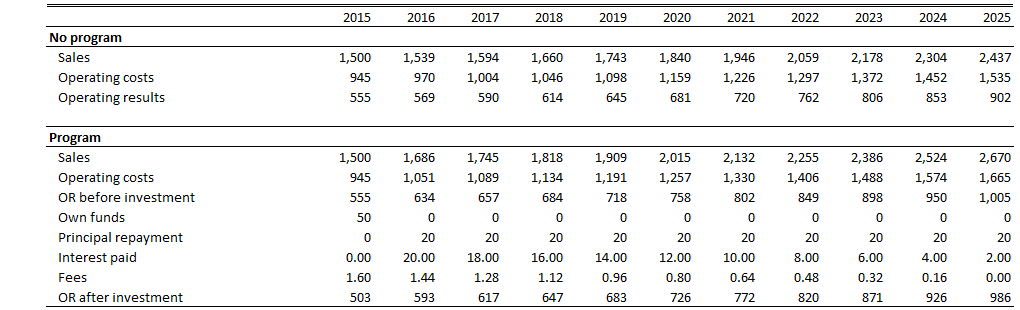
Sensitivity analysis – aggregate results - 50% increase in system NPLs



Note: values in thousands of US dollars

Table IV.H.1

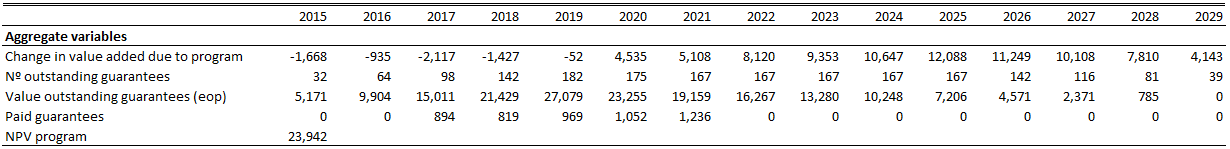
Sensitivity analysis – typical firm - 100% increase in system NPLs



Note: values in thousands of US dollars

Table IV.H.2

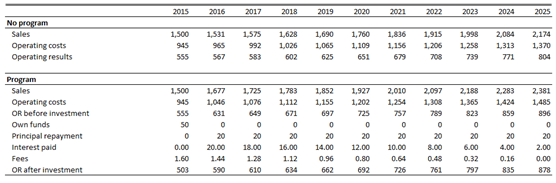
Sensitivity analysis – aggregate results - 100% increase in system NPLs



Note: values in thousands of US dollars

Table IV.I.1

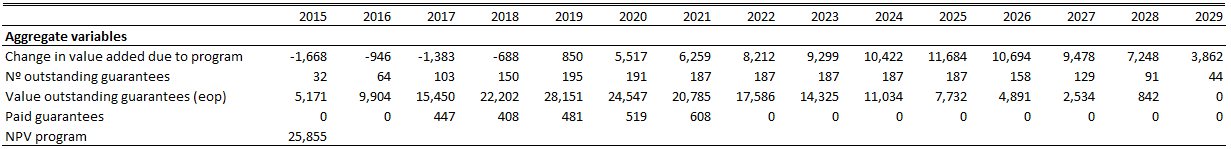
Sensitivity analysis – typical firm - 50% lower underlying GDP growth



Note: values in thousands of US dollars

Table IV.I.2

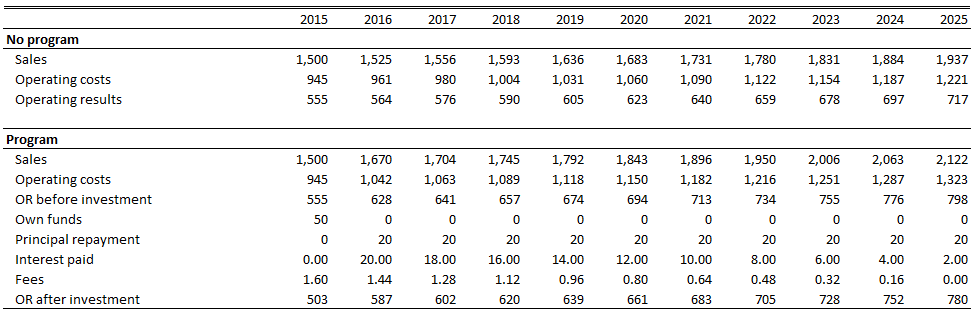
Sensitivity analysis – aggregate results - 50% lower underlying GDP growth



Note: values in thousands of US dollars

Table IV.J.1

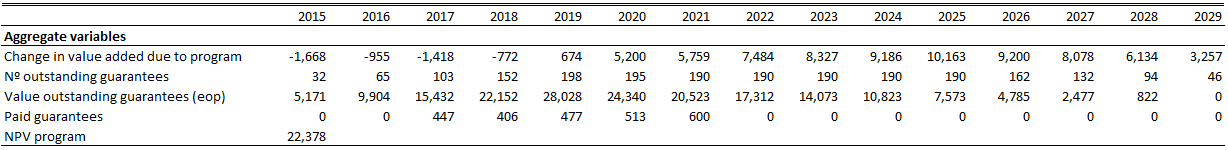
Sensitivity analysis – typical firm - 100% lower underlying GDP growth



Note: values in thousands of US dollars

Table IV.J.2

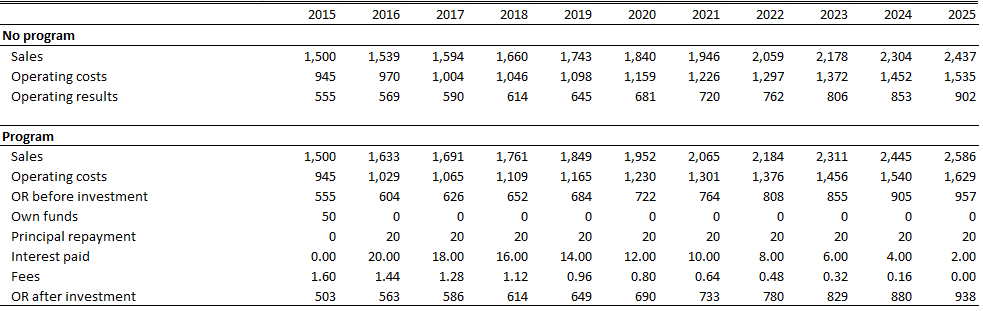
Sensitivity analysis – aggregate results - 100% lower underlying GDP growth



Note: values in thousands of US dollars

Table IV.K.1

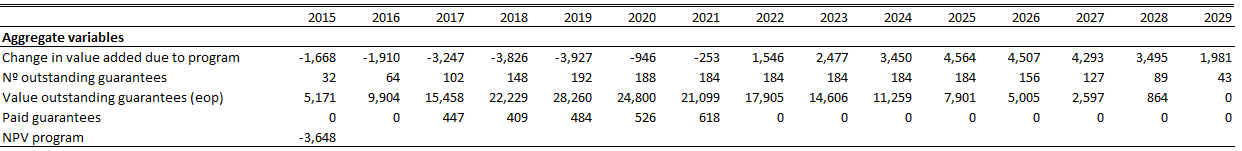
Sensitivity analysis – typical firm – no reduction in costs and 50% lower productivity gains



Note: values in thousands of US dollars

Table IV.K.2

Sensitivity analysis – aggregate results - no reduction in costs and 50% lower productivity gains



Note: values in thousands of US dollars

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1. This section draws from [“Financial intermediation and linkages between credit and productivity in Barbados”](http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38793856)  [↑](#footnote-ref-1)
2. US$0.2 million will be used to contribute to the operational costs. [↑](#footnote-ref-2)
3. CBB Working Paper #14/1 [↑](#footnote-ref-3)
4. CBB Working Paper #13/11 [↑](#footnote-ref-4)
5. Although as it is noted later on, the recent recession certainly compounds the problem. [↑](#footnote-ref-5)
6. Craigwell, R. 2010. Lending behavior and credit rationing in Barbados: a regime switching model. CBB. [↑](#footnote-ref-6)
7. In Craigwell and Kaidou-Jeffrey the regimes are rationing vs no-rationing referring to all sectors –it then makes a consideration concerning particular sectors. [↑](#footnote-ref-7)
8. Bynoe, R. 2010, The impact of macroeconomic risk on commercial bank lending behavior in Barbados, CBB. [↑](#footnote-ref-8)
9. CBB Working Paper #14/2 [↑](#footnote-ref-9)
10. 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-10)
11. Arraiz, I., Melendez, M, and Stucchi, R., 2012, Evidence from the Colombian National Guarantee Fund, Working Paper OVE/WP-02-12, IADB. [↑](#footnote-ref-11)
12. 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-12)
13. 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 forprofit 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-13)
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23. 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-23)
24. 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-24)
25. Financial institutions may profit from the guarantee even if they keep their overall marginal lending with the same distributional characteristics that they would have observed in a scenario without credit guarantees. However, given the initial distribution of risks and returns for the projects being financed and under standard assumptions about portfolio choice, financial institutions could still improve their expected profits by increasing the overall amount of lending. [↑](#footnote-ref-25)
26. Riding et al. (2003) find additionality of 74.8% which appears to be excessively high when compared with the rest of the literature. [↑](#footnote-ref-26)
27. It is expected that additionality would increase in the early stages of the guarantee. If the estimates are computed too close from the inception of the scheme, the changes they may not be yet statistically. Alternatively, after some time, the effect can began to increase at a faster rate and considering one extra period (typically a year) of data can render significantly different estimates. Moreover, the very design of the scheme may induce additionality to stabilize after a period of time, of it can start to decline after it peaks at a certain level. [↑](#footnote-ref-27)
28. Going from a ratio of 25% to 30% would accelerate productivity growth by 0.27% to 0.4% per year in their sample. [↑](#footnote-ref-28)
29. The GMM dynamic panel estimators are specifically designed to address the econometric problems induced by unobserved country-specific effects and joint endogeneity of the explanatory variables in lagged-dependent-variable models. [↑](#footnote-ref-29)
30. The assumption is revisited in the following section that characterizes the environment in which the CBA is carried-out. The CBA captures this, and the 6.9% corresponds to a productivity gain (not increased inputs) that translates into higher sales. [↑](#footnote-ref-30)
31. The benefit will be computed as the differential value added as a consequence of the program –that is, as the increased GDP. [↑](#footnote-ref-31)
32. It is worth stressing that the current exercise aims to answer the question of whether the program is expected to increase income in Barbados, and that this question can potentially have a positive answer even in the absence of productivity gains. [↑](#footnote-ref-32)
33. As it is clear from the following details, we are also taking into account the potential implicit subsidies in the scheme. [↑](#footnote-ref-33)
34. The following information is taken from: Enterprise Surveys (2010), SALISES 2009, interviews carried-out as part of the [Demand Analysis](http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38805523), IMF (various sources, WEO, Art. IV, country reports). [↑](#footnote-ref-34)
35. This interviews were a key input for the [Demand Analysis](http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=38995189) [↑](#footnote-ref-35)
36. This results in 202 guaranteed loans (or 202 firms if each firm receives only one guaranteed loan). [↑](#footnote-ref-36)
37. Repositioning the Manufacturing Sector in Barbados (SALISES, 2009). [↑](#footnote-ref-37)
38. This is relevant for the computation of value added at the end of the credit cycle (or after default depending on the type of firm under consideration). [↑](#footnote-ref-38)
39. Again, this follows the principle of prudence since assuming a longer period in good standing would increase the net present value of the program. [↑](#footnote-ref-39)
40. This are mostly variable costs, as the fund will use the current infrastructure currently in place in the CBB (fixed costs independent of the operation of the fund). [↑](#footnote-ref-40)