

Cost Benefit Scenarios for Loan Guarantees

Final Report

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Cost-Benefit Scenarios for Loan Guarantees

Executive Summary

TASK

The Small Business Loans Act provides federally guaranteed term loans for eligible Canadian businesses. Claims on, and take-up of, SBLA guaranteed loans are sensitive to particular attributes of the program, a program for which cost-recovery is imperative. To achieve the goal of cost recovery, attributes of the Act may require amending. This report describes the results of work that simulates the effects on cost recovery of changes to selected parameters of the SBLA. It identifies associations between default rates, on the one hand, and selected SBLA parameters and eligibility criteria on the other hand. This report presents simulation-based estimates of estimated impacts on cost recovery of simultaneous changes to specific program attributes.

Caveats

In presenting these findings, several *caveats* must be made clear from the outset.

- Foremost among the *caveats* is that the data employed here are problematic in terms of guiding policy. This so for several reasons.
 - Default rates and claims rates cannot be measured in absolute terms until all loans in a given cohort have matured. The SBLA Administrative database records claims and defaults only for lending periods 11 and 12. The vast majority of loans made during these lending periods have not yet reached maturity: some loans which will default have not yet done so. This “censoring” of data means that true default rates are likely to be understated if measured now. At best, *patterns* of default rates across various categories of loans may be identified. This work employs such patterns.
 - To forecast future claims and defaults requires that policy makers understand the links between default rates and attributes of the program. This requires reliable information on default rates (see caveat #1) but also require measurements of how these defaults react to shifts in program parameters. This is further complicated because the frequency of changes to the program attributes has caused loan take up rates, the risk composition of the portfolio, and default rates to fluctuate. Three important dates at which program parameters shifted can be discerned in the eight years since 1990.
 1. Lending Period 11 ended March 31, 1993. As of *April 1, 1993*: eligibility was extended to larger firms and

additional sectors; the loan ceiling was increased from \$100,000 to \$250,000; the percentage of asset that could be financed was increased to 100% (from 80% for equipment and 90% for land); the loss sharing ratio changed from 85% government / 15% lender to 90% government / 10% lender; and the initial loan registration fee increased to 2% from 1%

2. **March 31, 1995.** Effective March 31, 1995, an additional 1.25% administration fee was introduced.
3. **January 1, 1996.** As of January 1, 1996, the financing rate and the loss sharing ratio were amended. The percentage of financing was reduced from 100% of cost of asset to 90%; the loss sharing ratio changed to 85% government / 15% lender/
4. Superimposed on these changes in policy parameters, the SBLA changed the form and content of its registration form effective January 1, 1995. Certain data items available after this date are not available prior (e.g., certain classes of use of loan proceeds, term loans, etc.).

Findings

- This work relies extensively on the dates on which SBLA borrowers *default*. For administrative purposes, the date on which claims are paid is generally employed. The latter is useful because *claims* tend to lag lending by an average of two to three years. *Defaults*, however, occur sooner - approximately two-thirds of defaults occur within two years of the lending date. The lag between default and claim depends on several intervening factors, including a reporting lag on the part of lenders and a processing period during which government reviews the claims.
 - SBLA loans exhibit an average term of 5.25 years. A large fraction of SBLA loans have been made within the last four years. Because of the term, the reporting lag (12 months, on average) and the processing period (30 working days, on average), there is little reliable information about defaults of the most recent loans, and even less information about claims.
 - Two default rate estimates are employed. *Long term* default rates, are computed as the fraction of loans made during a specified period that have been reported as in default. *Second, initial-year* default rates, are computed as the fraction of loans made in a specified period that defaulted within one year of loan origination. The former primarily reflects defaults that occur during the course of trading; the latter, arguably, is weighted more by lending decisions that may not have

been well taken. Thus, the two measures are weighted differentially by default factors. Because of the reporting and processing lags, both measures are biased downwards: they tend to understate actual default rates.

A material increase in lending under the terms of the SBLA may be traced back to April 1, 1993 when several parameters of the Act were simultaneously amended. The lesser part of this increase was attributable to larger loans, although the average loan size increased by approximately 50 percent. Most of the increase resulted from an unprecedented increase in the take-up of SBLA loans.

The recent rate of claims, however, seems disproportionately larger than would be expected simply on the basis of increased SBLA lending. The increased rate of claims in recent years also appears to reflect a shift in the riskiness of the portfolio. In spite of the defaults, previous studies have shown that the SBLA is an efficient and effective means of job creation, and has a high level of incrementality (as high as 86 percent, even if incrementality is defined conservatively).

The study investigated the associations between default rates and salient program parameters. Findings include:

1. Period 11 data indicate that default frequency may increase with loan size. Larger loans involve high claims both because they involve more capital and because they tend to default earlier. Because of the data problems mentioned earlier, this finding is not definitive. Further analysis of this observation is warranted because of the confounding effects program changes during the periods investigated.
2. Loans to newer firms default with high frequency. Yet, program incrementality is best achieved by maintaining loans to new and small business borrowers.
3. Defaults and claims were relatively high for the retail and the accommodation sector and the food & beverage service sector. However, without more specific information, it is difficult to recommend amending eligibility requirements on a sectoral basis.
4. High rates of defaults were observed when borrowers used their loans to finance leasehold improvements and when they used their loan to finance the SBLA registration fee
5. High rates of default, particularly initial-year defaults were observed during the sub-period in which the guarantee level on SBLA loans had been increased from 85% to 90%.
6. Data do not allow for easily interpretable conclusions for the most recent lending sub-period. This is because of the term inherent in SBLA loans and the reporting lag that allows lenders up to three years to report defaults.

Based on simulations, it was found that the likelihood of cost recovery is maximized with reductions in the level of guarantee from 85 to 80 percent

(selectively or across the board). Changes to the financing rate also improve the probability of cost recovery. The two parameters (guarantee level and financing rate) affect lenders and borrowers differently. Reductions in these rates make both stakeholders take on a greater share of risk.

Cost-Benefit Scenarios for Loan Guarantees

Table of Contents

Objective	6
Scope of the Work	6
Principal Tasks	6
A Note Regarding Default Rates	8
An Overall Perspective	10
Lending Activity	10
Overall Perspective on Defaults	14
Findings of the Base Case Analysis: Defaults and Program Attributes	15
Size of Loans.	15
Lending by Loan Size	15
The Impact of Loan Size on Default Rates	16
Impact of Loan Size: Conclusions	21
Sectoral Impacts on Lending Activity and Defaults	22
Lending Activity by Sector	22
Defaults by Sector	22
Lending Activity and Defaults: Age of Borrowers	23
Lending Activity by Age of Borrower Firm	23
Defaults by Age of Borrower Firm	24
Lending Activity and Default by Use of Loan Proceeds	24
Default Frequencies and the Guarantee Level	26
Summary: Key Drivers of Defaults	27
Towards Cost Recovery: Simulating the Impacts of Amendments	28
Defining Cost Recovery: Some Gratuitous Comments	28
Simulating Changes to SBLA Parameters	30
Scenarios to be Investigated	30
The Base Case Scenario	31
Summary	34
Appendix Sample Spreadsheets	35

Cost-Benefit Scenarios for Loan Guarantees

OBJECTIVE

The Small Business Loans Act (SBLA henceforth, 1961) provides federally guaranteed term loans for eligible Canadian businesses. In addition, it appears to be a government imperative that the program should operate on a cost-recovery basis. Recent experience with the SBLA points to the perception that both claims on, and take-up of, SBLA guaranteed loans are sensitive to particular attributes of the program.¹ To further the goal of cost recovery, attributes of the Act may require amending.

Therefore, this report describes the results of work that simulates the effects on cost recovery of changes to selected parameters of the SBLA. The report begins by identifying associations between default rates, on the one hand, and selected SBLA parameters and eligibility criteria. This report continues by describing simulation-based estimates of the cost recovery effects of simultaneous changes to specific program attributes. The final section of the report provides a summary and details specific recommendations.

SCOPE OF THE WORK

Principal Tasks

The work reported here consisted of two main components. First, it involved the analysis of the recent historical experience of the SBLA program. This was conducted to establish a base scenario from which further analyses could be conducted. Second, the work generated estimates of the impact on cost recovery of specific combinations of SBLA program design alternatives.

Base Case Analysis. The base case analysis used data from lending periods 11 and 12, and specific sub-periods within that timeframe. The sub-periods included the following time intervals: Period 11 from April 1, 1990 through March 31, 1993; Period 12 from April 1, 1993 through March 31, 1995 when an additional 1.25% annual fee was initiated; Period 12 from March 31, 1995 through December 31, 1995, when the financing rate and the guarantee level were as reduced to 90% and 85%, respectively; Period 12 since January 1, 1996.

The base case aspect of the study has itself two components. The first element of the base case was a series of breakdowns of the historical default rates and costs of claims by

¹ Reasons for what appears to be an increase in rates of claims and default are not entirely clear; however, a likely explanation is that adverse selection that may have resulted from the increased fees on SBLA loans.

sector, age of business, purpose of the loan, size of loan, and other dimensions that were deemed to be of interest during the course of the analysis. The second aspect of the base case was a synthesis of the cost estimates derived as noted above with previously-reported estimates of benefits and economic impact.

The base case analysis served three purposes. It provided a sense of the current cost recovery situation of the program. Second, it contributed estimates of important variables (such as default rates and portfolio composition) necessary to subsequent phases of this work. A third benefit is that the base case generated benchmarks against which alternative program designs might be compared.

Analysis of Alternative Program Designs. The second major element of the study was the investigation of the potential future impacts on cost recovery of particular changes in the design of the SBLA program. The parameters of interest were identified through extensive consultations with Industry Canada staff and were founded in part on the interim findings of the analyses that constituted the first phase of this study. This simulation was conducted by designing alternative scenarios across which comparisons might be drawn. Attributes of interest included maximum loan size, level of guarantee, purpose of the loan proceeds, and financing rates.

To accomplish these objectives, the work comprised five tasks, as follows.

1. **Assembly of SBLA Data.** The first task was to assemble in machine-readable form data from the SBLA loan files for lending periods 11 and 12. For each case, data included:
 - loan status (defaulted, still active, etc.);
 - relevant costs (size of claim, amounts paid);
 - important dates (date loan made, date of default if applicable, date claim received, and the date the claim was paid); and,
 - firm-specific attributes as available (sector, number of employees, age of firm, legal status of the firm, size of loan, intended use of loan proceeds, etc. as available).
2. **Design of Alternative Scenarios.** A parallel task was the initial identification of the range of reasonable and realistic values to be taken on by attributes of interest (e.g., loan ceiling alternatives, loan guarantee levels, etc.). This determination was accomplished through consultations with Industry Canada officials.
3. **Base Case Estimation.** The third step was to be the estimation of the base case cost-effectiveness. This task was reported to Industry Canada by means of a series of interim reports and meetings.

4. **Estimation of Alternative Scenarios.** The fourth step was estimation of the cost effectiveness of alternative combinations of the short list of program design attributes as identified in the earlier steps.
5. **Report Preparation.** The final step was the writing of this report writing and presentations as required by the project authority. Accordingly, this report provides, among other things, a summary of the base case, historical estimates of program cost-effectiveness, and a reporting of the relative impacts of changes to the program parameters of interest.

A Note Regarding Default Rates

Before proceeding, it is essential to recognize several considerations with respect to the default rates to be reported here. One of these considerations is that it is vital to distinguish between *claims* and *defaults*.

The database used for the analyses reported here is an extract of that maintained for administrative purposes by the SBLA Administration and Industry Canada. For budgeting and administration, it is *claims* that are most important. This importance is reflected in Industry Canada's presentation to the House of Commons Standing Committee on Public Accounts, "Small Business Loans Program" (as well as in other publications). The conventional wisdom of these publications is that a high proportion of *claims* follows the loan origination by two to three years.² However, for research purposes, the date of claim payment is inappropriate. The problematic nature of the claim date stems from the fact that the claim date reflects:

- The time between loan origination and default;
- The time between default and the lender's submission of a claim to the SBLA administration [the "reporting lag"]. Lenders have as long as 36 months from default to submit claims to the SBLA administration.^{3,4}
- The time between receipt of a claim and its payment [the "processing period"]. This interval reflects, among other factors,

² See, among other references, "Small Business Loans Program", Industry Canada presentation to the House of Commons Standing Committee on Public Accounts, February 1998, page 14.

³ This policy was established to encourage lenders to seek recoveries on defaults. The result, though, is that the SBLA administration will not learn for some time about loans that are already in default.

⁴ The average lag between the date of default and the date on which a claim is received by the SBLA administration is 12.1 months. This "reporting lag", however, varies. For example loans that had defaulted during fiscal years 1993 and 1994 and that were in excess of \$150,000 displayed an average reporting lag of 24 to 26 months. Smaller loans that defaulted in fiscal years 1993 and 1994 exhibited reporting lags of 12 to 15 months.

requests to lenders from the SBLA Administration for additional information, time for resolution of challenges, etc.⁵

This study, therefore, focuses on *default rate* estimates. This distinction is drawn for several reasons. First, of course, claims follow from defaults. If the reasons and factors in defaults can be established, their respective impacts on claims will also follow. Second, this study discerns two broad categories of reasons for defaults.

The first category comprises those firms that defaulted (eventually resulting in a claim) because the lender had originally made an imprudent decision to grant the loan. We take, as our premise, that loan account managers would not knowingly advance a loan if they could foresee default in the near term. However, lenders may err by granting loans to firms that were bad risks. We attempt to measure the frequency of such decisions by computing the rate at which loans default within one year of the loan decision: “initial-year” default rates.⁶

The second category of reasons for default embodies loans advanced to good risks, yet loans that eventually defaulted. Arguably, default would, on average, occur later in the life of such loans than for those loans that had been made as a consequence of poor initial lending decisions. We therefore define “long term” default rates as the proportion of loans in default over the recorded life of the loans (many of which are outstanding at the time of this analysis). A lender would have granted a loan to a firm that was a good risk, but, during the course of trading, the firm encountered financial distress, leading to default.

Both of these default rates will tend to understate the actual levels of default that will be experienced within the SBLA program. This is so for three reasons.

1. The average term of SBLA loans is 5.25 years; yet, 25 percent of SBLA loans have maturities in excess of six years. Therefore, many loans made as long ago as 1993 are still active, so far in good standing, but with the potential to default in the future.
2. The reporting lag mentioned previously implies that lenders have yet to file claims on loans that have defaulted as long ago as fiscal 1995.⁷ Such defaults, therefore, are not yet reflected on the SBLA administrative database. Consequently, as researchers and policy makers, we are unable to assess with confidence default rates of loans advanced since 1995.

⁵ This “processing period” has decreased from an average of 2.5 calendar months in 1993 and 1994 to an average of 1.5 calendar months (approximately 30 working days) since April 1, 1995

⁶ We recognize that these are imperfect measures: that some low risk loans will surely default within one year, and, conversely, that some high risk loans may not default at all. Nonetheless, we contend that differences in one-year default rates reflect differences in loan account managers’ ability to make well-advised lending decisions.

⁷ The database used for this study reflected loans made until the end of 1997. It contains no information later than December 31, 1997.

3. While certainly a minor item, there may be a lag of a few days between receipt of a claim and the recording of the default on the database.

For these reasons, default rates reported here must not be viewed in absolute terms. Rather, the default rates reported here are only meaningful in comparative terms within particular cohorts of loans. In addition, default data for loans advanced during 1996 and 1997 are neither useful nor reliable.

AN OVERALL PERSPECTIVE

Lending Activity

While the SBLA has been in effect since 1961, the volume of lending has, in recent years, reached unprecedented levels. Chart 1 shows the volume of lending (in terms of number of loans) by fiscal year since 1990.

From Chart 1, it is clear that a material increase in lending under the terms of the SBLA may be traced back to April 1, 1993 when several parameters of the Act were amended. Consequently, the value of the SBLA portfolio increased dramatically, as shown in Chart 2. The lesser part of this increase was attributable to larger loans, albeit the average loan size increased by approximately 50 percent (from less than \$40,000 to more than \$60,000). Most of the increase resulted from the increase in the take-up of SBLA loans.

Chart 1

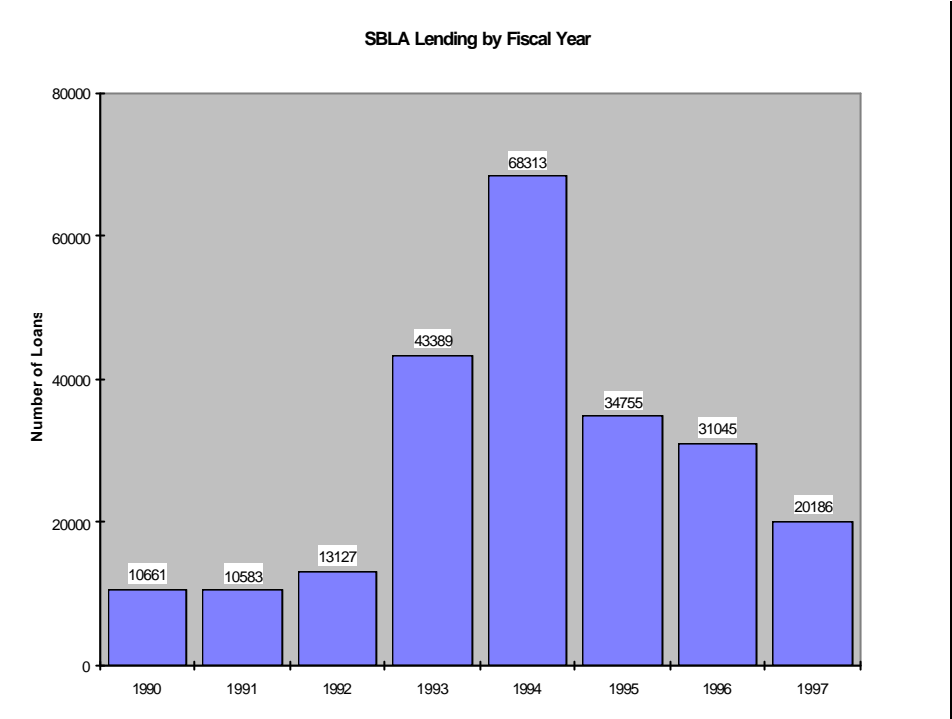


Chart 2

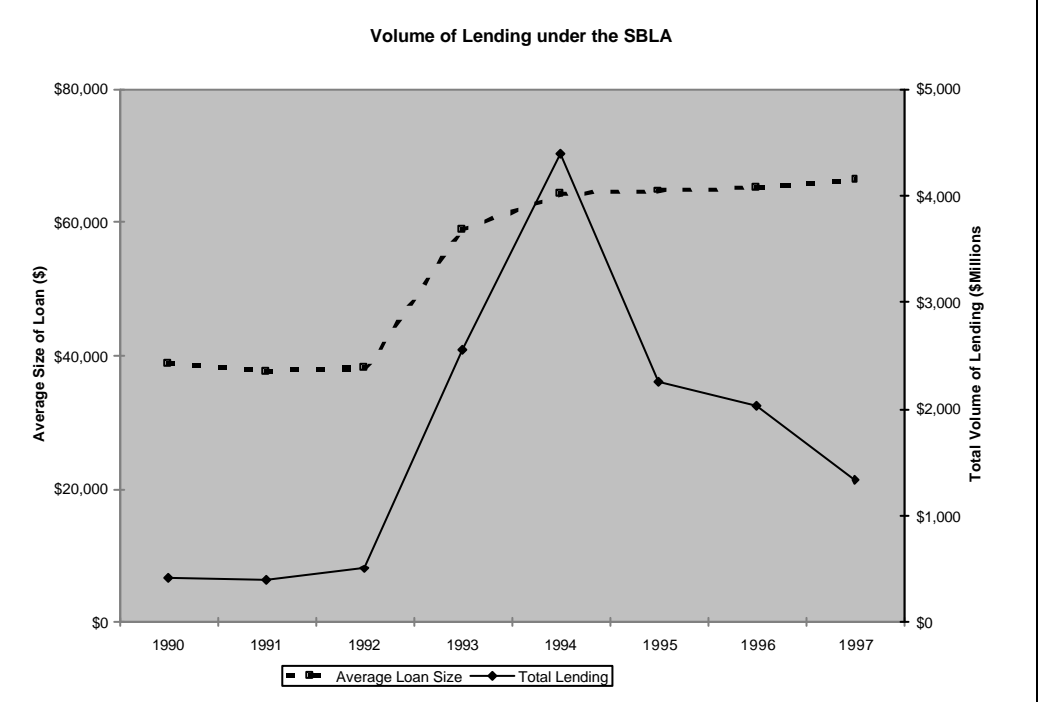


Table 1 reports in more detail lending activity under the terms of the SBLA for salient sub-periods since April 1, 1990. From Table 1, it appears that in spite of the flux in the attributes of the SBLA program parameters, the distribution of loans across loan sizes has shown stability. Table 1 also demonstrates the shifts in the take-up of the program.⁸

More loans, of course, imply more defaults and claims. The recent rate of claims, however, seems disproportionately larger than would be expected simply on the basis of increased SBLA lending and appears to reflect a shift in the riskiness of the portfolio.

In part, this shift arose during the April 1 1993 to December 31, 1995 period when a 90% level of guarantee was in effect and when borrowers were able to use SBLA loans to finance a higher proportion of their needs. In part, the increased risk arguably reflects the higher level of fees that came into effect April 1, 1995. This fee increase probably contributed to adverse selection. The theory of adverse selection contends that firms that are willing to pay more for the “insurance” afforded by the SBLA are riskier. According to the adverse selection explanation, borrowers willing to pay elevated fees were probably those in more need of a loan guarantee.

To provide further explanations of the patterns of defaults, this report will document associations between default rates and controllable parameters of the Act.

⁸ Activity under the program peaked during the month of March 1995. During this one month, more than 11,000 loans were extended, involving \$816 million. This compares with approximately 34,000 loans for a total of \$1.3 billion for the three-year period ending March 31, 1993.

Table 1: Lending Activity by Size of Loan and Lending Sub-Period

Loan Size Category	Average Loan Size (\$)	Number of Loans	Proportion of Loans	Cumulative Proportion	Volume of Lending (\$)	Proportion of Lending	Cumulative Proportion
Period 11							
AMOUNT OF LOAN							
LESS THAN \$25,000	\$ 13,548	15,667	45.4%	45.4%	\$ 212,259,016	16.0%	16.0%
\$25,000 TO \$49,999	\$ 35,294	8,607	25.0%	70.4%	\$ 303,774,376	23.0%	39.0%
\$50,000 TO \$74,999	\$ 60,048	4,473	13.0%	83.3%	\$ 268,595,696	20.3%	59.3%
\$75,000 TO \$99,999	\$ 93,664	5,748	16.7%	100.0%	\$ 538,377,875	40.7%	100.0%
<i>Total</i>	\$ 38,354	34,495			\$ 1,323,006,962		
Period 12 to March 31, 1995							
LESS THAN \$25,000	\$ 13,926	38,075	34.1%	34.1%	\$ 530,224,129	7.6%	7.6%
\$25,000 TO \$49,999	\$ 34,855	26,492	23.7%	57.8%	\$ 923,383,140	13.3%	20.9%
\$50,000 TO \$74,999	\$ 59,945	14,228	12.7%	70.5%	\$ 852,902,882	12.3%	33.2%
\$75,000 TO \$99,999	\$ 85,706	9,368	8.4%	78.9%	\$ 802,897,985	11.6%	44.8%
\$100,000 TO \$149,999	\$ 117,346	11,783	10.5%	89.5%	\$ 1,382,685,178	19.9%	64.7%
\$150,000 TO \$199,999	\$ 167,846	4,880	4.4%	93.8%	\$ 819,087,205	11.8%	76.5%
> \$200,000	\$ 236,766	6,906	6.2%	100.0%	\$ 1,635,107,773	23.5%	100.0%
<i>Total</i>	\$ 62,169	111,732			\$ 6,946,288,293		
Period 12 from April 1 1995 through December 31, 1995							
LESS THAN \$25,000	\$ 13,892	8,777	31.0%	31.0%	\$ 121,929,293	6.6%	6.6%
\$25,000 TO \$49,999	\$ 35,091	6,663	23.5%	54.5%	\$ 233,813,220	12.6%	19.2%
\$50,000 TO \$74,999	\$ 59,854	3,920	13.8%	68.3%	\$ 234,628,912	12.7%	31.9%
\$75,000 TO \$99,999	\$ 85,638	2,372	8.4%	76.6%	\$ 203,132,223	11.0%	42.9%
\$100,000 TO \$149,999	\$ 117,045	3,474	12.3%	88.9%	\$ 406,614,159	22.0%	64.8%
\$150,000 TO \$199,999	\$ 168,577	1,367	4.8%	93.7%	\$ 230,444,493	12.4%	77.3%
> \$200,000	\$ 236,343	1,782	6.3%	100.0%	\$ 421,163,237	22.7%	100.0%
<i>Total</i>	\$ 65,305	28,355			\$ 1,851,725,537		
Period 12 since January 1, 1996							
LESS THAN \$25,000	\$ 14,133	17,608	30.5%	30.5%	\$ 248,852,787	6.6%	6.6%
\$25,000 TO \$49,999	\$ 35,374	13,910	24.1%	54.7%	\$ 492,056,739	13.1%	19.7%
\$50,000 TO \$74,999	\$ 60,151	8,225	14.3%	69.0%	\$ 494,743,468	13.1%	32.8%
\$75,000 TO \$99,999	\$ 85,741	4,859	8.4%	77.4%	\$ 416,615,607	11.1%	43.9%
\$100,000 TO \$149,999	\$ 118,027	6,601	11.5%	88.8%	\$ 779,096,765	20.7%	64.6%
\$150,000 TO \$199,999	\$ 169,172	2,777	4.8%	93.7%	\$ 469,790,911	12.5%	77.1%
> \$200,000	\$ 236,208	3,657	6.3%	100.0%	\$ 863,813,457	22.9%	100.0%
<i>Total</i>	\$ 65,322	57,637			\$ 3,764,969,735		
Total							
LESS THAN \$25,000	\$ 13,894	80,127	34.5%	34.5%	\$ 1,113,265,224	8.0%	8.0%
\$25,000 TO \$49,999	\$ 35,081	55,672	24.0%	58.5%	\$ 1,953,027,475	14.1%	22.1%
\$50,000 TO \$74,999	\$ 60,004	30,846	13.3%	71.8%	\$ 1,850,870,957	13.3%	35.4%
\$75,000 TO \$99,999	\$ 87,753	22,347	9.6%	81.4%	\$ 1,961,023,690	14.1%	49.5%
\$100,000 TO \$149,999	\$ 117,504	21,858	9.4%	90.8%	\$ 2,568,396,103	18.5%	68.0%
\$150,000 TO \$199,999	\$ 168,365	9,024	3.9%	94.7%	\$ 1,519,322,610	10.9%	79.0%
> \$200,000	\$ 236,540	12,345	5.3%	100.0%	\$ 2,920,084,467	21.0%	100.0%
<i>Total</i>	\$ 59,797	232,219			\$ 13,885,990,525		

Overall Perspective on Defaults

The default rate for loans made during period 11 was 6.16%. Moreover, 4.51% of the loans made between April 1 1993 and March 31, 1995, have already been registered as claims.⁹ Table 2 provides further detail regarding default patterns.

Table 2: Overall Perspective on Defaults

Lending Period	Average Loan	Number of Loans	Volume of Lending	Rate of Lending (Loans/mo.)	Rate of Lending (\$/mo.)	Default Rate (Overall)	Default Rate (Initial Year)
Less than \$100,000							
Period 11	\$ 38,354	34,495	\$ 1,323,006,961.65	958	\$ 36,750,193	6.16%	2.04%
Period 12 to 3/31/95	\$ 35,269	88,163	\$ 3,109,408,135.40	3,673	\$ 129,558,672	4.22%	2.27%
Period 12: 4/1/95 - 12/31/95	\$ 36,513	21,732	\$ 793,503,647.49	2,415	\$ 88,167,072	1.94%	1.76%
Period 12 since 1/1/96	\$ 37,045	44,602	\$ 1,652,268,601.12	1,858	\$ 68,844,525	0.09%	0.08%
Total	\$ 36,394	188,992	\$ 6,878,187,345.66	2,032	\$ 73,959,004	3.34%	1.65%
\$100,000 to \$150,000							
Period 12 to 3/31/95	\$ 117,346	11,783	\$ 1,382,685,178.38	491	\$ 57,611,882	5.14%	2.80%
Period 12: 4/1/95 - 12/31/95	\$ 117,045	3,474	\$ 406,614,159.02	386	\$ 45,179,351	1.84%	1.67%
Period 12 since 1/1/96	\$ 118,027	6,601	\$ 779,096,765.35	275	\$ 32,462,365	0.05%	0.05%
Total	\$ 117,504	21,858	\$ 2,568,396,102.75	383	\$ 45,059,581	3.08%	1.79%
More than \$150,000							
Period 12 to 3/31/95	\$ 208,230	11,786	\$ 2,454,194,978.76	491	\$ 102,258,124	6.00%	3.36%
Period 12: 4/1/95 - 12/31/95	\$ 206,925	3,149	\$ 651,607,730.03	350	\$ 72,400,859	1.21%	1.05%
Period 12 since 1/1/96	\$ 207,275	6,434	\$ 1,333,604,368.22	268	\$ 55,566,849	0.00%	0.00%
Total	\$ 207,750	21,369	\$ 4,439,407,077.01	375	\$ 77,884,335	3.49%	2.01%
Total							
Period 11	\$ 38,354	34,495	\$ 1,323,006,961.65	1,437	\$ 55,125,290	6.16%	2.04%
Period 12 to 3/31/95	\$ 62,169	111,732	\$ 6,946,288,292.54	12,415	\$ 771,809,810	4.51%	2.44%
Period 12: 4/1/95 - 12/31/95	\$ 65,305	28,355	\$ 1,851,725,536.54	1,181	\$ 77,155,231	1.85%	1.67%
Period 12 since 1/1/96	\$ 65,322	57,637	\$ 3,764,969,734.69	1,011	\$ 66,052,101	0.07%	0.07%
Total	\$ 59,797	232,219	\$ 13,885,990,525.42			3.33%	1.70%

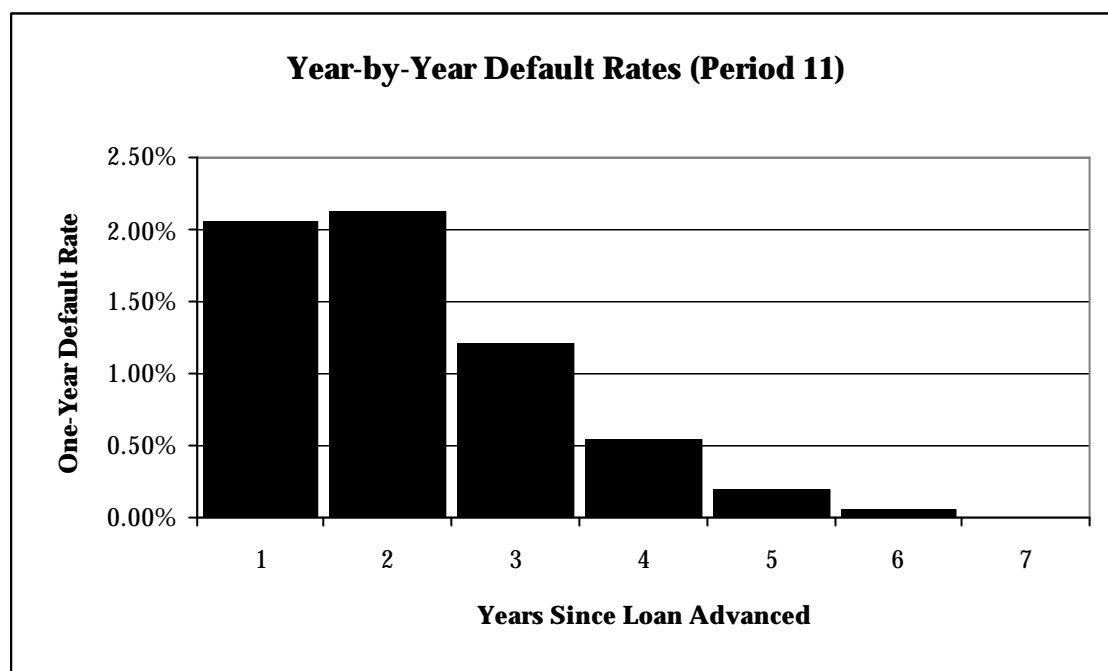
To gain a further perspective of the patterns of default, Chart 3 shows the chronology by which loans go into default (based on the data for Period 11).¹⁰ From this pattern, of the loans advanced in a particular period, approximately two thirds of the defaults occur during the first two years of the loan maturity.¹¹ Note that this differs from the traditional wisdom; however, the traditional reference – as noted previously - relates to the timing of *claims*, not *defaults*.

⁹ Recall that the average loan advanced during 1993 (5.25-year term) is still outstanding. For this reason, as well as because of the reporting lag previously mentioned, the long-term default rate for such loans is certain to be higher, possibly substantially so, than 4.9%.

¹⁰ Most period 11 defaults have probably been registered with the SBLA as claims.

¹¹ For the same reasons that default rates reported here understate the true values, this is likely to be somewhat of an overstatement.

Chart 3



With this overall perspective in mind, we now turn to an analysis of the links between particular program attributes, defaults, and benefits.

FINDINGS OF THE BASE CASE ANALYSIS: DEFAULTS AND PROGRAM ATTRIBUTES

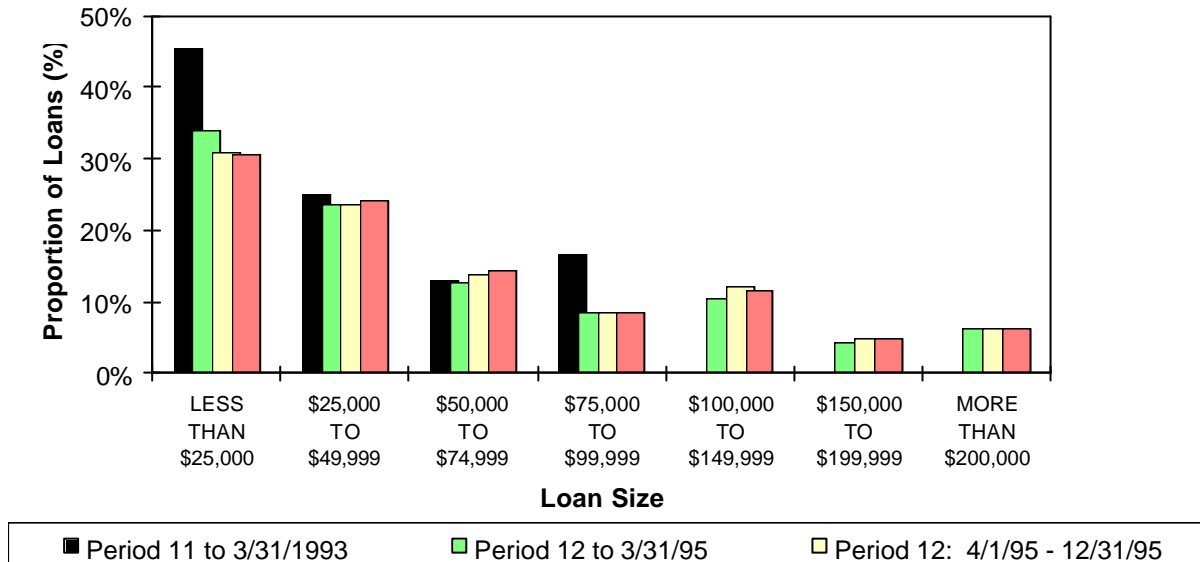
Size of Loans.

Lending by Loan Size

Table 1 summarized lending activity by loan size category for sub-periods from April 1 1990 through December 31, 1997. From this table, it is evident that most SBLA borrowers borrow small amounts. For example, as currently designed, the average loan is approximately \$65,000 (Table 1); however, almost two loans out of three involve less than \$75,000. The \$65,000 average is skewed upwards by relatively fewer larger loans (only 11.1 percent of current loans exceed \$150,000).

Chart 4 shows the distribution of loan sizes for the two main lending periods of interest here.

Distribution of Loan Size by SBLA Regime



The Impact of Loan Size on Default Rates

Loan size is of interest because the April 1993 modifications to the SBLA eligibility criteria allowed for larger firms and larger loans. In the interim, anecdotal experience has been that larger loans appeared to default more frequently. The charts that follow support the anecdotal observations in that, compared with smaller loans, larger loans made prior to January 1, 1996:

- default more frequently;
- default earlier in the life of the loan; and,
- entail larger dollar volumes of claims.

Chart 5 illustrates the long-term default rates by size of loan for three periods of interest. Recall that default rates are best regarded in *relative* terms and that some defaults for period 12 have neither occurred nor been reported. This is true for both large and small loans. Hence, the *pattern* whereby larger loans default more frequently is evident. Chart 6, which depicts the initial year default rates, displays a similar pattern.

Chart 5

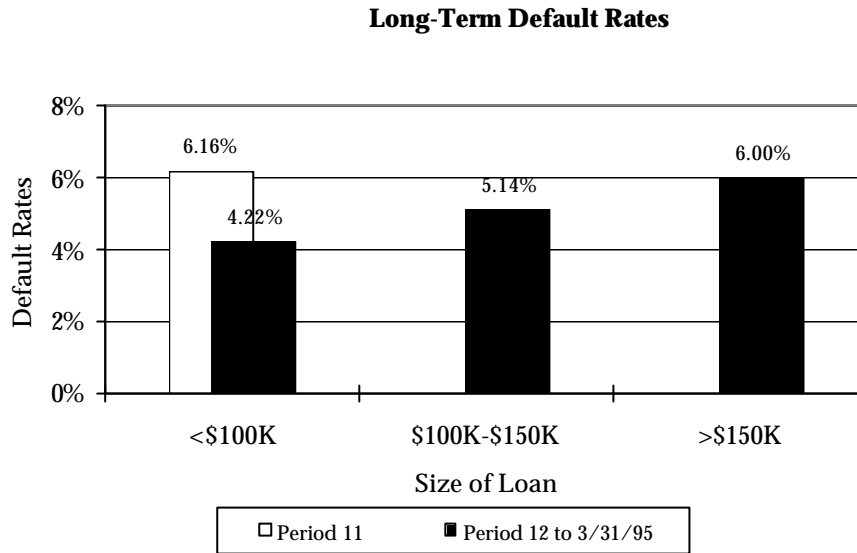
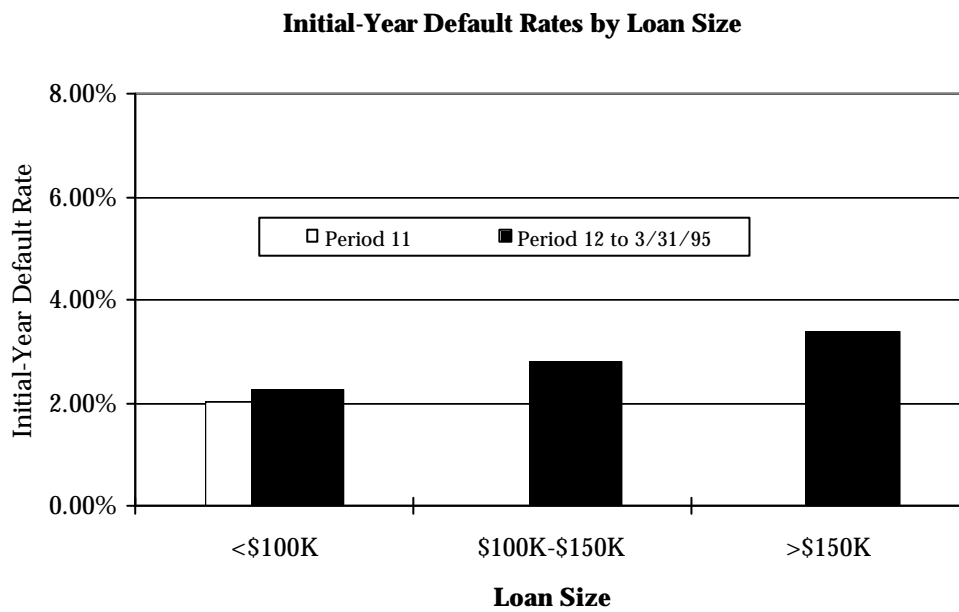
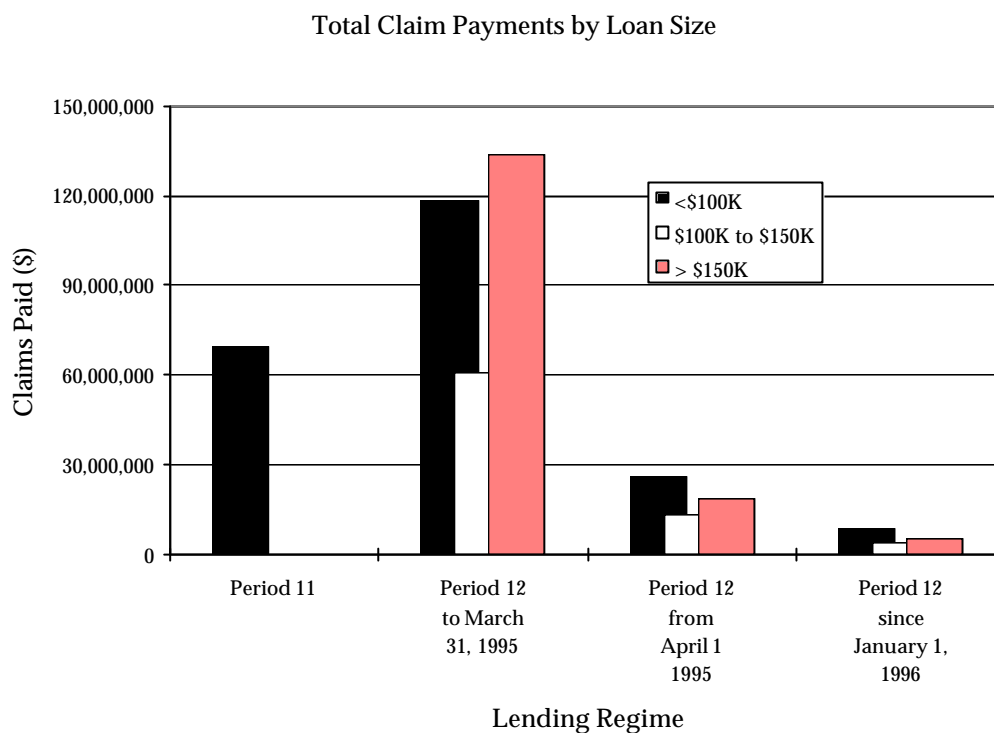


Chart 6



Larger loans appear to default more frequently than smaller loans. They also typically involve larger claims on the SBLA. Chart 7 shows the total claims paid by loan size grouping between April 1 1993 and March 31, 1995.



To investigate more completely the patterns between loan size, defaults, and claims, Charts 8 through 11 illustrate the default chronology (see, for example, Chart 3) for the various loan size groupings in effect in lending period 11 and are drawn on comparable scales. In each chart, the overall period 11 default chronology is also shown for reference.

Chart 8

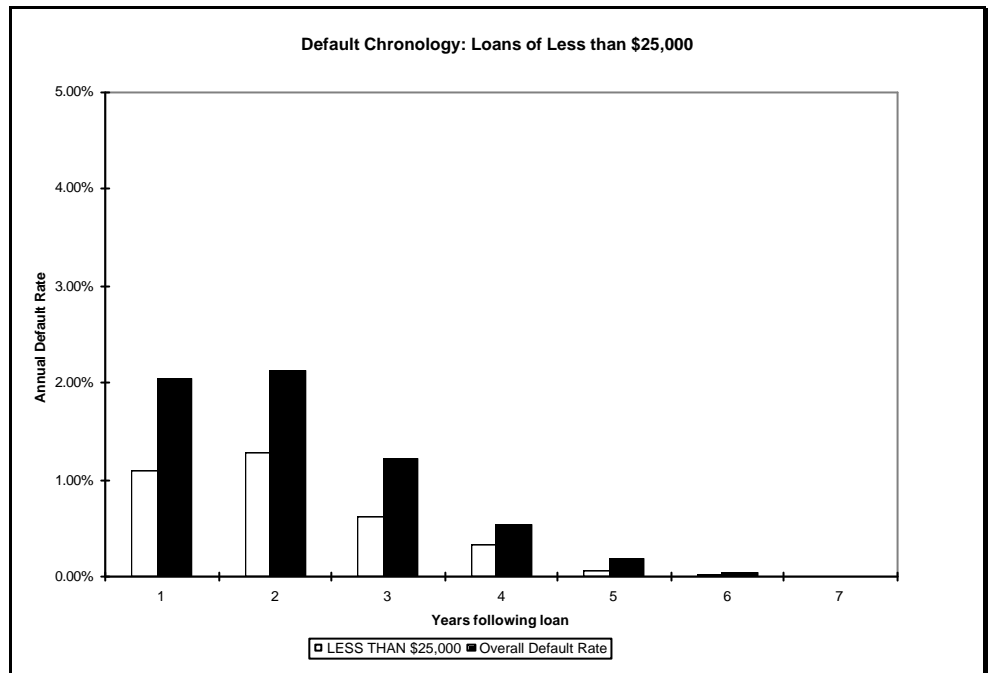


Chart 9

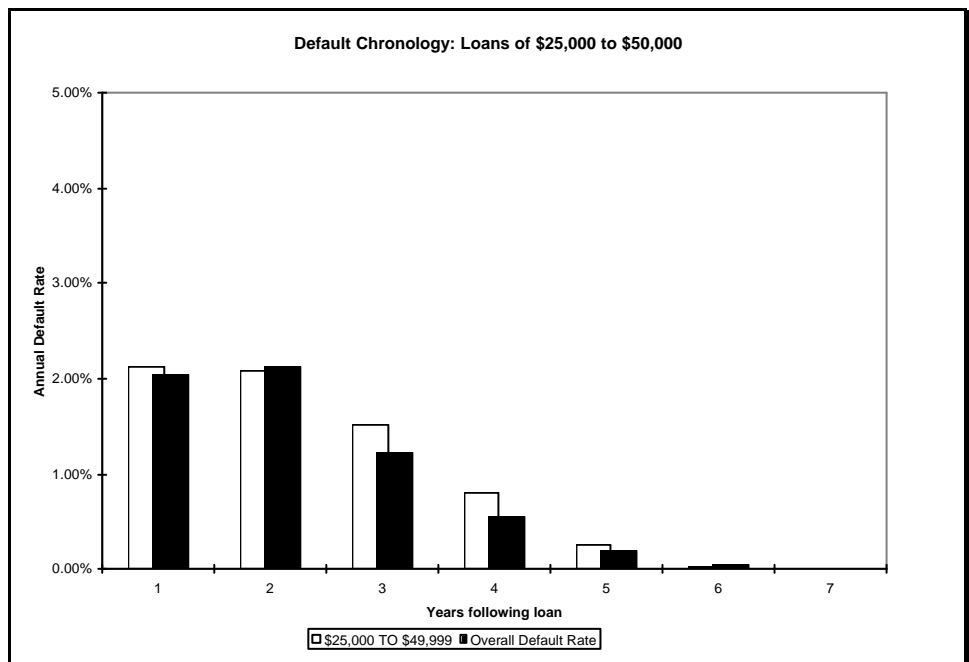


Chart 10

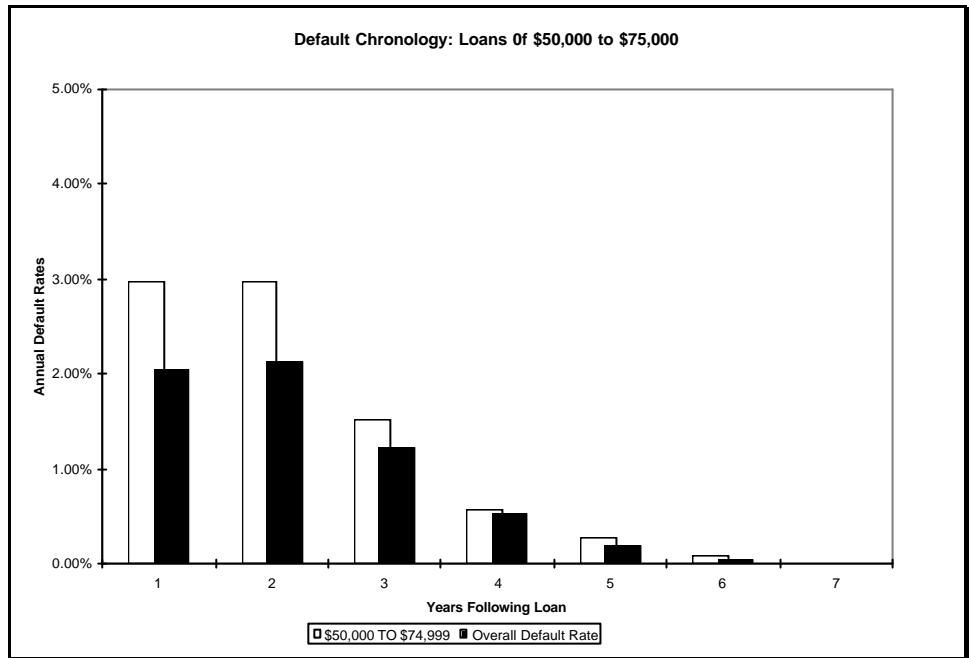
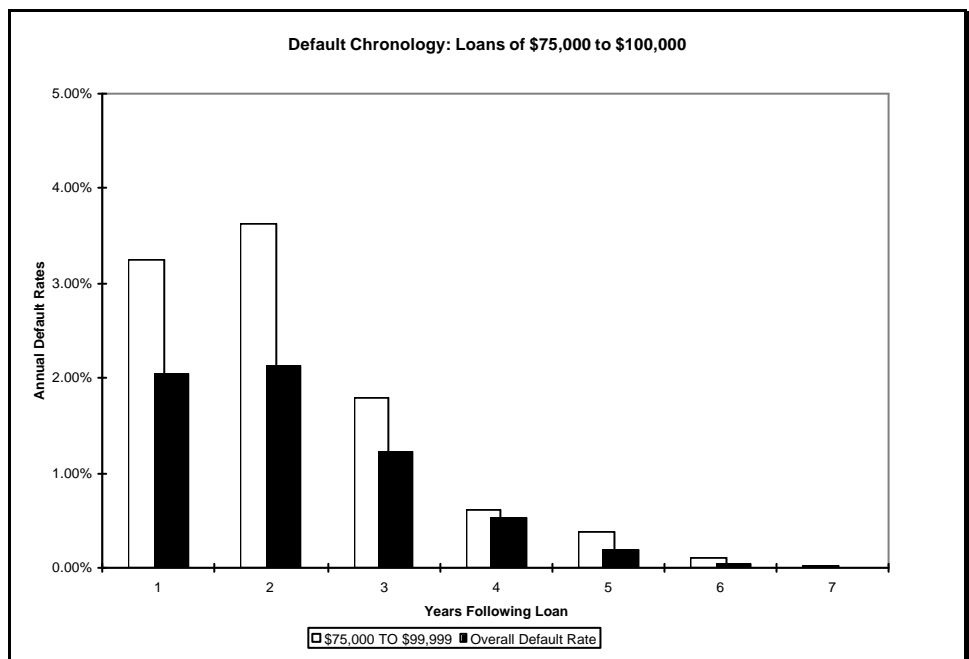


Chart 11



From this sequence of charts, it is seen that during Lending Period 11 larger loans defaulted more frequently than smaller loans and that they also defaulted earlier in the

term of the loan. This combination of higher rates of default, higher loan principals, and earlier defaults results in disproportionately higher claims.

The conclusion that larger loans are riskier cannot, however, be considered as definitive. This is because the impact of loan size may be confounded by other factors. For example, loans in excess of \$100,000 have only been permitted since April 1, 1993. As noted previously, a variety of parameters of the SBLA were altered as of that date. These included the level of guarantee - a variable that arguably affects default rates. Accordingly, these other factors need to be assessed.

The loan size effect is further confounded because larger loans also typically result in more job creation and contribute more to fee income to the SBLA.

Impact of Loan Size: Conclusions

The data analyzed here provide early indications that larger loans:

1. Tend to default with greater frequency than smaller loans;
2. Involve larger claims because they are larger loans;
3. Involve larger claims because large loans tend to default earlier in the term of the loan than do small loans.

Therefore, in terms of claims and defaults, larger loans may more problematic than smaller ones. This finding, however, must not be viewed as definitive. Confirmatory evidence from more recent lending periods is necessary before recommending a decrease in the loan ceiling. Moreover, the April 1 1993 to January 1, 1996 sub-period is anomalous in that the level of guarantee and the financing rates were both set at elevated values. It is not clear, therefore, whether the problem is larger loans or higher guarantee levels. In addition, by virtue of their size, large loans also involve greater absolute dollar fee incomes to government. This trade off will be investigated in a subsequent section.

Nonetheless, these findings are suggestive and bear implications for future analysis. This is particularly important because small loans also, arguably, reflect greater levels of incrementality than large loans. Small loans are more typical of early-stage and start-up firms, both of which have traditionally experienced relatively greater difficulty in accessing debt capital (Thompson-Lightstone, 1996, 1997). In general, larger loans tend to be more typical of larger firms, firms that would generally be better able to qualify for traditional bank borrowing.

Moreover, the benefit of fraudulent loan applications (see Auditor General of Canada, 1998) is arguably greater with larger loans. For example, with small loans, the fixed costs of incorporating several "firms" is a higher proportion of the capital involved.

Sectoral Impacts on Lending Activity and Defaults

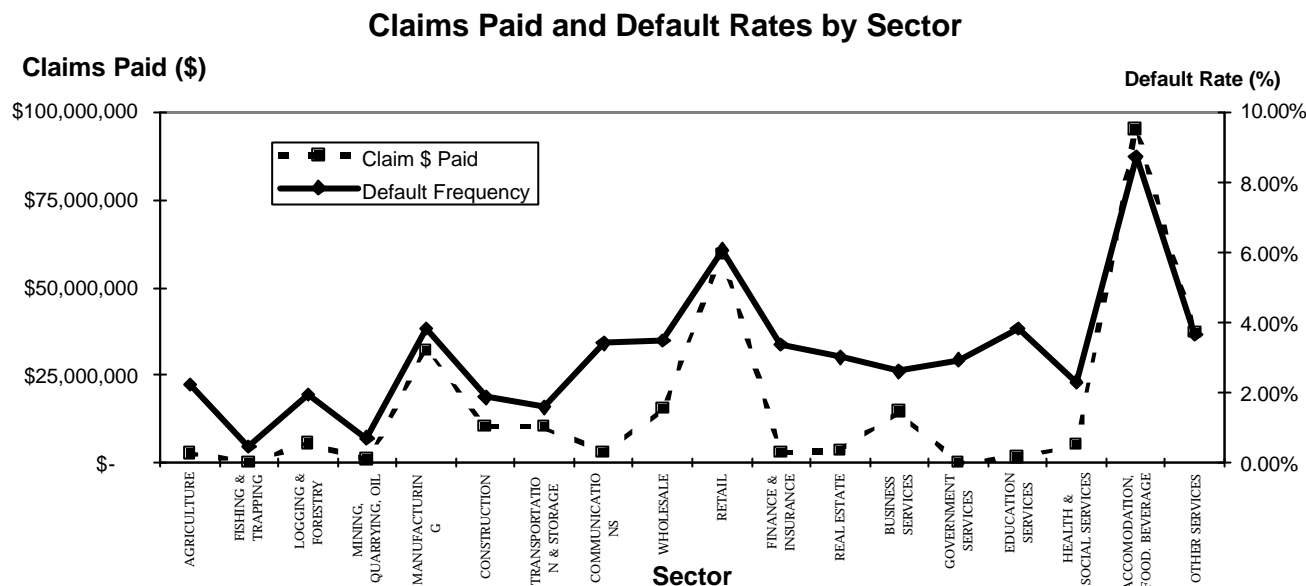
Lending Activity by Sector

Table 3 presents the lending activity by sector for the SBLA for the January 1 1996 through December 31, 1997 sub-period. From these data, four sectors (Transportation & storage, Retail, Accommodation etc., and Other services) are seen to be the major users of the program. Together, these sectors account for almost 65 percent of the loans and approximately two-thirds of the value of loans advanced under the SBLA.

Sector	Average Loan (\$)	Number of Loans	Proportion of Loans	Value of Loans	Proportion of Value
AGRICULTURE	\$ 66,771	760	1.32%	\$ 50,745,758	1.35%
FISHING & TRAPPING	\$ 73,011	616	1.07%	\$ 44,974,815	1.20%
LOGGING & FORESTRY	\$ 64,849	2,569	4.46%	\$ 166,597,858	4.43%
MINING, QUARRYING, OIL	\$ 74,732	911	1.58%	\$ 68,080,979	1.81%
MANUFACTURING	\$ 73,311	4,547	7.90%	\$ 333,343,151	8.87%
CONSTRUCTION	\$ 47,217	3,223	5.60%	\$ 152,178,967	4.05%
TRANSPORTATION & STORAGE	\$ 59,342	8,416	14.62%	\$ 499,418,628	13.28%
COMMUNICATIONS	\$ 56,376	1,040	1.81%	\$ 58,630,803	1.56%
WHOLESALE	\$ 63,487	1,402	2.44%	\$ 89,009,337	2.37%
RETAIL	\$ 63,381	8,043	13.97%	\$ 509,775,430	13.56%
FINANCE & INSURANCE	\$ 55,498	234	0.41%	\$ 12,986,535	0.35%
REAL ESTATE	\$ 53,596	340	0.59%	\$ 18,222,581	0.48%
BUSINESS SERVICES	\$ 49,704	2,908	5.05%	\$ 144,539,194	3.84%
GOVERNMENT SERVICES	\$ 71,070	35	0.06%	\$ 2,487,467	0.07%
EDUCATION SERVICES	\$ 65,798	484	0.84%	\$ 31,846,349	0.85%
HEALTH & SOCIAL SERVICES	\$ 77,442	1,343	2.33%	\$ 104,004,882	2.77%
ACCOMODATION, ETC.	\$ 92,537	7,425	12.90%	\$ 687,088,028	18.27%
OTHER SERVICES	\$ 59,225	13,268	23.05%	\$ 785,802,886	20.90%
TOTAL	\$65,314	57,564	100.00%	\$ 3,759,733,649	100.0%

Defaults by Sector

Chart 12 presents the long term default rates and total claim payments for each of the standard industrial sectors, based on data from April 1, 1993 through March 31, 1995. According to these data problematic sectors include the retail sector and that which embraces accommodation, food and beverage services. These are also two of the sectors that represent the most frequent users of the program. While these two particular sectors represent relatively high risks, the data are not sufficiently specific to justify recommendations about amending eligibility criteria on a sectoral basis.



Lending Activity and Defaults: Age of Borrowers

Lending Activity by Age of Borrower Firm

Table 4 reports, for the post-January 1995 period, the breakdown of lending activity by age of the business borrower. It is worth noting that the average loan size does not vary systematically by age of business: indeed, the average loan size is somewhat higher for newer firms. This may indicate that new firms, traditionally thought to be more risky, sought relatively large loans. Newer firms account for more than 60 percent of SBLA borrowing. It also seems reasonable to expect that new firms account for a material component of the incremental lending under the SBLA.

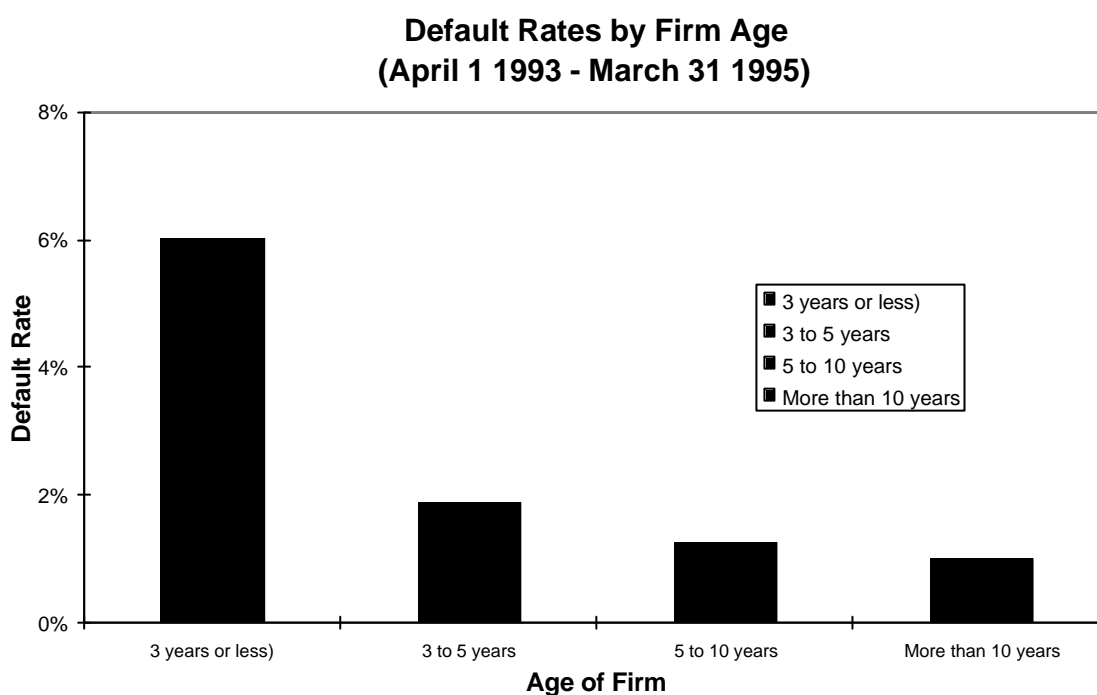
Table 4: Lending Activity by Age of Business Borrower

Age of Borrower Firm	Average Loan (\$)	Number of Loans	Proportion of Loans	Value of Loans (\$billions)	Proportion of Loan Value
3 years or less)	\$ 68,337	35,803	62.1%	2.45	65.0%
3 to 5 years	\$ 56,779	5,065	8.8%	0.29	7.6%
5 to 10 years	\$ 59,267	8,202	14.2%	0.49	12.9%
More than 10 years	\$ 63,513	8,560	14.9%	0.54	14.4%
Total	\$ 65,313	57,630	100.0%	3.76	100.0%

Defaults by Age of Borrower Firm

Chart 13 presents default rates (long-term and initial year for period 11) by the age of the borrower firm at the time the loan was advanced.¹² It is no surprise to find that early-stage firms represented relatively greater lending risks than those posed by later-stage firms.

Chart 13



While early-stage firms do report higher default rates, such firms are also primary users of the SBLA program and represent a group of borrowers for which incrementality is likely to be high. Therefore, to reduce the eligibility of early-stage firms seems to run counter to the spirit of the program goals.

Lending Activity and Default by Use of Loan Proceeds

Table 5 summarizes lending activity and default patterns according to the usage of the proceeds of the loan. The table reflects usage over the full sample period; however, default rates reflect the loans made between April 1 1993 and March 31, 1995. In most instances, the loan proceeds were used for several purposes. Table 5 is constructed according to the primary purpose of the loan. For example, the primary purpose of a

¹² Based on the period from April 1 1993 through March 31, 1995.

given loan was defined as leasehold improvements only if more than 50 percent of the total loan principal was used for premises alteration by a tenant.¹³

Table 5: Lending Activity and Default Experience by Purpose of Loan

	<i>Average Loan Size</i>	<i>Number of Loans</i>	<i>Proportion of Loans</i>	<i>Volume of Loans (\$Millions)</i>	<i>Proportion of Lending</i>	<i>Long-term Default Rate</i>	<i>Initial-Year Default Rate</i>
1990-1997							
Multipurpose	95,913	1,287	0.55%	123.40	0.89%	3.91%	2.26%
Equipment	53,300	191,098	82.29%	10,185.60	73.35%	3.23%	1.68%
Premises alteration by Owner	73,075	1,563	0.67%	114.20	0.82%	0.26%	0.26%
Leasehold Improvements	86,808	26,743	11.52%	2,321.50	16.72%	4.46%	2.21%
Building Construction	86,036	1,790	0.77%	154.00	1.11%	4.02%	0.95%
Land or Building Purchase	101,378	9,738	4.19%	987.20	7.11%	2.38%	0.92%
Total	59,797	232,219		13,885.90		3.33%	1.70%
April 1 1993-March 31 1995							
Multipurpose	102,044	398	0.7%	40.6	1.1%	6.34%	3.04%
Equipment	58,065	46,279	80.3%	2,687.2	71.4%	3.89%	2.26%
Premises alteration by Owner	71,583	1,117	1.9%	80.0	2.1%	0.91%	0.91%
Leasehold Improvements	83,339	5,386	9.3%	448.9	11.9%	4.97%	2.77%
Building Construction	115,754	523	0.9%	60.5	1.6%	0.38%	0.38%
Land or Building Purchase	113,796	3,927	6.8%	446.9	11.8%	1.19%	0.7%
Total	65,314	57,639	100.0%	3,764.0	100.0%	3.97%	2.28%

From Table 5, it is evident that the primary purpose of SBLA borrowing is to finance the acquisition of equipment. Equipment purchases are the primary purpose of more than four SBLA loans out of every five and account for more than 70 percent of the total value of SBLA borrowing.

In terms of default impacts, Table 5 shows that when funds are used to finance leasehold improvements, defaults are 20 to 25 percent more likely to occur. In addition, this category of usage accounts for a material proportion of SBLA loans (approximately 10

¹³ In some instances, no one purpose accounted for more than one-half the total value of the loan. Such loans are referred to as "Multipurpose" in Table 5.

percent of loans and 15 percent of loan amounts). Accordingly, it may prove useful to investigate the impacts on cost recovery of disallowing this usage category.

A second aspect of the use of loan proceeds is worth noting, namely, that when the borrower uses part of the loan proceeds to pay the initial registration fee, the likelihood of default is often increased. For example, Table 6 shows how initial-year default rates and longer term default rates vary by usage category according to whether or not the borrower paid the initial fee from the loan proceeds. Table 6 uses default data based on the April 1 1993 through March 31 1995 period. As seen in Table 6, the default rates for most categories of loan seemed to be greater, according to whether or not proceeds of the loan had been used to pay the initial registration fee. Recall that the most frequent use of SBLA loans is to finance equipment purchases or for leasehold improvements. For these important categories, there is a greater tendency for default to occur if the proceeds of the loan had been used to finance fee payments. This may be an attribute of the program that, if rescinded, could improve the likelihood of cost recovery.

Table 6: Default Rates by Usage Category and Fee Financing

Primary Purpose of Loan Proceeds	Long-Term Default Rates		Initial-Year Default Rates	
	Did not Use Proceeds for Fee	Used Proceeds for Fee	Did not Use Proceeds for Fee	Used Proceeds for Fee
Multipurpose	7.49%	4.78%	3.96%	1.79%
Equipment	3.61%	4.32%	2.06%	2.57%
Premises alteration by Owner	1.08%	0.61%	1.08%	0.61%
Leasehold Improvements	4.49%	5.79%	2.31%	3.56%
Building Construction	0.00%	0.29%	0.00%	0.29%
Land or Building Purchase	1.44%	0.86%	0.91%	0.43%
Total	3.69%	4.40%	2.07%	2.62%

Default Frequencies and the Guarantee Level

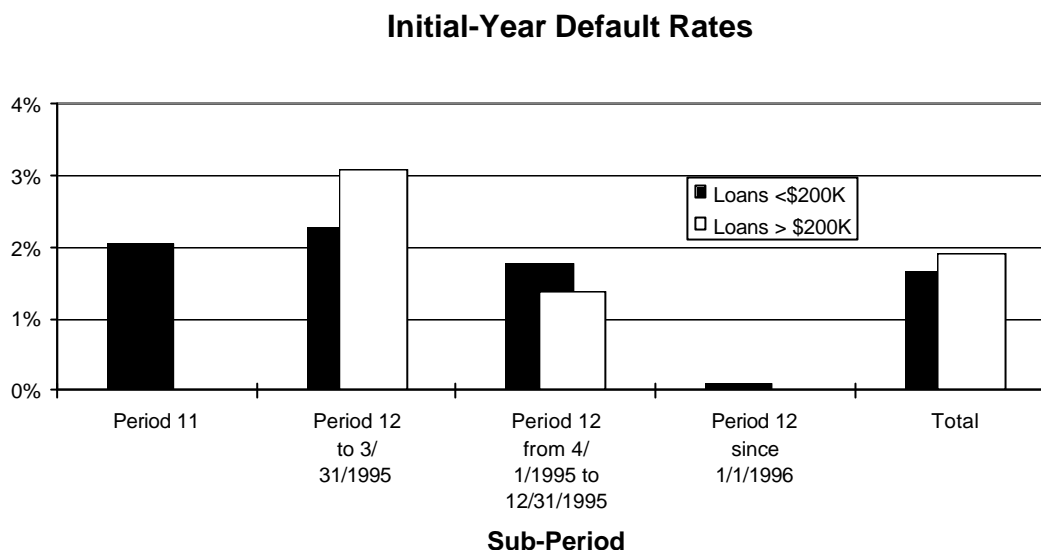
If it is assumed that commercial lenders seek as much profit from their portfolio of SBLA loans as they do from their respective portfolios of non-guaranteed loans, it is possible to derive a relationship between the default rates on the two portfolios.¹⁴ According to this relationship, lenders achieve equivalent profits when the default rate in the portfolio of guaranteed loans is approximately equal to $[1/(1-g)]$ times the default rate in their portfolio of non-guaranteed loans (g is the level of the guarantee, e.g., 85 percent). This logic predicts that an increase in the guarantee level from 85 percent to 90 percent (as occurred from April 1, 1993 until December 31, 1995) would lead to a 50 percent increase in default rates for the guaranteed portfolio.

Chart 14 compares the initial-year default rates for loans made in the April 1, 1993 – December 31, 1995 period (90% level of guarantee) with the initial-year-default rates on loans made both prior to this period and subsequently. According to this finding, a

¹⁴ Riding, Allan (1997). "On the Care and Nurture of Loan Guarantee Programs", Financing Growth in Canada, Chapter 15, P. J. Halpern, Ed., University of Calgary Press, pp. 655-657.

material increase in defaults occurred in conjunction with this amendment to the SBLA.¹⁵

Chart 14



Given the findings displayed in Chart 14 and the logic in Riding (1997), there is reason to expect that a reduction in the level of the guarantee would lead to a reduction in default frequencies. This is largely because lenders would have more to lose in the event of default. Lenders would be underwriting a larger portion of the risk. According to this logic, a reduction in guarantee level to 80 percent would reduce the default rate by an estimated 25 percent. Even if this conclusion overstates what might actually occur, it seems clear that default rates are highly sensitive the level of the guarantee.¹⁶

An associated parameter is the proportion of the asset that may be financed with the loan: the financing rate. If the financing rate were decreased, the SBLA would share more of the risk with the borrower and would face a reduced claim in the event of default.

Summary: Key Drivers of Defaults

This section has investigated the association between important attributes of the SBLA and levels of claims and default. Key findings include the following.

¹⁵ It is recognized that a variety of SBLA parameters were modified during this period and that the increase in defaults may not be attributed uniquely to the shift in guarantee level.

¹⁶ In addition, of course, the reduction in the level of the guarantee would decrease the proportion of the loan that could be claimed from government in the event of default. This would also be true of a decrease in the financing rate.

1. Default frequency has historically increased with loan size. In addition, larger loans may have resulted in disproportionate amounts of claims, not only because they involve more capital, but also because they tended to default earlier in the course of the loan. Further analysis of this observation is warranted given the difficulty of interpreting recent data and the confounding effects of guarantee level during the periods investigated.
2. Loans to newer firms defaulted with greater frequency. However, it seems reasonable that greater program incrementality is achieved by maintaining loans to new and small business borrowers.
3. Defaults and claims were particularly associated with sectors such as the retail and the accommodation sector and the food & beverage service sector. These sectors, however, were important users of the program and account for a large proportion of SBLA lending. Without more specific information, it is difficult to recommend amending eligibility requirements on a sectoral basis.
4. High rates of defaults were observed when borrowers used their loans to finance leasehold improvements and when they used their loan to finance the SBLA registration fee. These findings may provide room to make amendments that could improve the likelihood of cost recovery.
5. High rates of initial-year defaults, were observed during the sub-period in which the guarantee level on SBLA loans had been increased from 85% to 90%.
6. Data do not allow for easily interpretable conclusions for the most recent lending sub-period. This is because of the term inherent in SBLA loans and the reporting lag that allows lenders up to three years to report defaults.

TOWARDS COST RECOVERY: SIMULATING THE IMPACTS OF AMENDMENTS

Defining Cost Recovery: Some Gratuitous Comments

Currently, cost recovery in the context of the SBLA is achieved when the fee income meets or exceeds the costs of honouring the guarantees on loans in default. This is a narrow definition. In several previous analyses, for example, it was found that the SBLA has been an effective means of job creation. The new jobs result in fewer individuals relying on employment insurance and welfare and more individuals being added to the tax base. These studies have also shown that the loans had often fueled the growth of borrowers, leading to high levels of sales, profits, and taxes for the firms. In this context, any program that achieves cost recovery in the narrow sense and generates additions to

taxes as above must be regarded as an important contributor to economic welfare and prosperity.

A second issue that often arises with respect to programs such as the SBLA is that of incrementality (sometimes known as *additionality* or its opposite, *deadweight*). This is, indeed, an important concept. It, too, has both a narrow definition and a wider understanding. Defined *narrowly*, incrementality obtains if a firm that would not have otherwise received a loan does receive a loan under the SBLA. At this extreme, if the loans advanced under the program would all have been advanced in the absence of the program, then the program would provide no incremental benefit. The notion of incrementality is more complex than this narrow definition suggests. Richard Meyer (1997) notes that such a definition is excessively limited.¹⁷ As pointed out by Meyer, incrementality can take one or more of several forms. A loan might be incremental if it:

- provided credit where, otherwise credit might not be granted;
- provides for a loan on more favourable terms (maturity, interest rate, governance) than would otherwise have been granted;
- provided for credit on a more timely basis than otherwise;
- facilitated or initiated a working relationship between a business borrower and a lending institution; or,
- if the guarantee provided for a broader financing package than would otherwise have been available.

Each of these definitions is consistent with the terms of the SBLA because each form of incrementality is arguably one that facilitates the establishment and expansion of small firms. However, these forms of incrementality are difficult to measure with precision. It calls for the measurer to be able to identify events that may or may not have happened if the existing program did not exist.¹⁸

Moreover specifications of incrementality are not necessarily mutually exclusive. For example, the guarantee may have facilitated more timely access to credit and may also have helped establish the borrower-lender relationship. This overlap must be considered when results are reported. Before considering some of the more nebulous of

¹⁷ Richard Meyer, "Comments", International Round Table on Loan Guarantee Programs, Inter-American Development Bank, June, 1996, Washington, D.C.

¹⁸ The survey that formed the basis of these comments sought a variety of indications and measures of performance. Question 5 sought respondents' estimation of how their performance would have been different if they had not been able to obtain the term loan. Respondents were asked whether sales, profit, and employment would have been higher or lower. Each respondent was then prompted to provide estimates of the extent to which sales, profits, and employment would have differed had the term loan not been available. Obviously, this question requires respondents' judgements about events that had not really occurred. Therefore, the findings may be used only as rough indications of how performance would have differed. (Because of its importance, respondents were asked about employment a second time, towards the end of the survey. In this second context, they were asked to specify how many additional employees resulted from the SBLA term loan and to identify how many of these employees had been unemployed at the time of the hiring.)

these alternative definitions, there remain clear situations where lending is arguably incremental. These are:

1. where the firm did not exist prior to the SBLA loan guarantee;
2. where the firm was a startup, yet recognizing that occasionally banks do lend to startup businesses;
3. where the owner(s) of the firm believe, with reason, that the firm could not have obtained sufficient capital otherwise.

Riding and Haines (1996) find that 54% of SBLA loans qualified as incremental under this most restrictive of definitions. More liberal interpretations of their findings suggest levels of incrementality of up to 86 percent. In terms of the benefits of SBLA loans, Riding and Haines found as follows.

- The cost of job creation attributable to the SBLA taking into account the most restrictive definition of incrementality was less than \$5,000.
- Approximately 5 percent of borrowers reported that the SBLA provided their firm with access to financing in a more timely manner than would otherwise have been available.
- 75 percent of respondents agreed that the SBLA “assisted in the development of [their] banking arrangement with the lender”. For 63.6 percent of the sample firms, the SBLA loan was the first borrowing the business had conducted with their lender.
- From the respondents Riding and Haines interviewed in 1996, only 14 percent were deadweight in the sense that none of the types of incrementality identified could be applied. It is quite possible that, among these businesses would be those that received credit on better terms than they might have had the guarantee not been available.¹⁹

SIMULATING CHANGES TO SBLA PARAMETERS

Scenarios to be Investigated

In the course of this study, the findings reported in previous sections were reported to the project authority. These results provided the basis for extensive discussions and

¹⁹ The plausibility of this reasoning is witnessed by Riding and Haines' 1994 comparison of SBLA bank files with the files of non-SBLA bank borrowers. They found that the term to maturity of SBLA loans tended to be longer than that of non-SBLA loans.

consultations, with the result that the following scenarios were identified for further analysis.

1. Base Case. The base case scenario comprised an assessment of cost recovery assuming that the current design of the SBLA would be in effect.
2. As for the base case, but with a guarantee level of 80% for loans in excess of \$150,000 (remains at 90% for loans of less than \$150,000) and guarantee levels of 80% when funds are to be used for leasehold improvements or transfer of ownership.
3. As for the base case, but with financing rate decreased to 75% from 90% for leasehold improvements and transfer of ownership usage categories.
4. Combination of scenarios 1 and 2 (i.e., 85% guarantee rate and 90% financing rate only on loans of less than \$150,000 if NOT used to finance leasehold improvements or change in ownership and 75% financing rate, 80% guarantee level for the latter two categories).
5. As for current SBLA but with 80% financing rate across the board.

To evaluate these scenarios, the project authority has been provided with a spreadsheet-based simulation tool. The simulator allows the project authority to evaluate these five scenarios under a variety of conditions and assumptions. Hence, these scenarios were estimated using a range of assumptions regarding potential overall default rates, interest rates, notional portfolio sizes, and fee structures.

The Base Case Scenario

As a basis for comparison, we suppose the following as a starting point:

- A notional portfolio of SBLA loans with a total value of \$14 billion distributed across categories of loans and usage groupings as has been true of the SBLA between January 1, 1995 and December 31, 1997. The notional size of the portfolio can be changed as desired.
- An overall default rate of 9 percent (this can be modified as desired).
- The current fee structure will remain in effect (two percent at outset and 1.25% of the outstanding balance annually).
- An interest rate on loans of 9% (also may be changed as desired).
- All current SBLA eligibility criteria and parameters (financing rate, guarantee level, usage categories) are in effect.

The results of this simulation are shown in the Appendix as Worksheet 1. The top section of the worksheet simulates fee income; the bottom section simulates claims.

Fee Income Simulation. Based on data gathered since January 1, 1995 the average term of SBLA loans is 63 months. Therefore, a five-year amortization schedule is used to compute fee incomes. This is shown in rows 6 through 15 of the worksheet and is based on the assumptions regarding interest rates made previously.

The amortization table is adjusted in rows 17 to 26 to reflect the proportion of SBLA loans estimated to default in each year as per Chart 3 of this report, cumulated. Rows 28 through 33 then use this amortization table to compute the fees payable according to the assumed fee schedule (can be changed by the user) and applies this fee structure to the notional \$14 billion portfolio. Present values of both the per-dollar-of-loan fee income and the total fee incomes are computed using a six percent discount rate to reflect the cost of funds to government. For the base case, with the current fee structure and the assumptions in place as above, it is estimated that fee income will be approximately \$643 million which has a present value of \$603 million.

Default Cost Simulation. The second segment of the worksheet estimates the cost to government of honouring claims on defaults. It begins in rows 39 through 46 by using the 1995-1997 proportions of the SBLA portfolio (e.g., 6.65% of loans in excess of \$150,000 were in the leasehold improvement category, etc).²⁰ This breakdown is necessary because, as seen earlier in this report, default rates vary with loan size and use of funds. These portfolio weightings are then applied to the notional size of the portfolio.

Rows 47 through 67 embody the user's assumptions about the program parameters of interest (e.g., 90 percent financing rate for all categories; 85 percent guarantee rate across the board), as inputted on the "SUMMARY" worksheet. These data fields (financing rate for each category of loan, guarantee level for each category of loan, overall default rate) can be changed at will by the user.

Overall default rates were based on users' assumptions about the future expected default rate for the portfolio. Regardless of the particular overall default rate, however, rates of default for particular sub-groupings of loans varied considerably. To investigate the potential effects of differential financing and guarantee levels, therefore, patterns of default among the categories of interest had to be established. These were determined by drawing on the actual distribution of default rates experienced within each of several designated lending sub-categories, for loans made between April 1 1993 and March 31 1995.

Specifically, long-term and one-year default rates were distributed as shown in Table 7 for loans of less than and more than \$150,000 and for two categories of loan usage. The overall (long term) default rate for this period was 3.97% and the overall initial year default rate was 2.28%. From this table, a consistent pattern emerges:

²⁰ Note here that any given loan could be used for several purposes. Loans were categorized as above if more than 50% of the loan proceeds were employed for one usage category (e.g., more than one-half of the loan proceeds for each loans in the leasehold improvements category were used to finance leasehold improvements.

- default rates on loans of less than \$150,000 used for leasehold improvements are approximately 1.6 times the overall default rates ($6.20 \div 3.97 = 1.63$; $3.61 \div 2.28 = 1.58$);
- default rates on loans of more than \$150,000 used for leasehold improvements are also approximately 1.6 times the overall default rates ($6.47 \div 3.97 = 1.56$; $3.66 \div 2.28 = 1.61$);
- default rates on loans of less than \$150,000 *not* used for leasehold improvements are approximately 0.84 times overall default rates ($3.29 \div 3.97 = 0.83$; $1.92 \div 2.28 = 0.84$);
- default rates on loans of more than \$150,000 *not* used for leasehold improvements are approximately 1.05 times the overall default rates ($4.16 \div 3.97 = 1.05$; $2.33 \div 2.28 = 1.02$).

These patterns were used to established the default rates in rows 66 to 70.²¹ The factors (1.6, etc.) were imbedded in the formulas that lay behind worksheet cells E68:F69.²²

Table 7: Distribution of Actual Default Rates

	Loans of Less Than \$150,000		Loans in Excess of \$150,000	
	Long-Term Default Rate	Initial-Year Default Rates	Long-Term Default Rate	Initial-Year Default Rates
Leasehold Improvements	6.47%	3.61%	6.20%	3.66%
Other categories	3.29%	1.92%	4.16%	2.33%

Based on the user's assumed overall default rate (worksheet cell E65) and the level of guarantee (85% or 80%; see Chart 14 and the discussion about it), the worksheet then computes the default rate for each of the four categories of loans (two usage types and two loan size groupings). Rows 72 to 77 report the average claim per dollar of loan. The default rates were then applied to the size of the portfolio and the claim per dollar of loan to compute the estimated claims for each of the four types of loan considered here.²³ These are reflected in rows 80 through 82. The final rows of the spreadsheet compute

²¹ At the request of the project authority, these patterns were also developed using \$200,000, instead of \$150,000, as the basis for categorization. Loans of less than \$200,000 used for leasehold improvements default 1.62 times the overall default rate; loans of more than \$200,000 used for leasehold improvements defaulted 1.54 times as often as the overall default rate. For loans that were not used to finance leasehold improvements, loans in excess of \$200,000 default at a rate that was 1.34 times the overall rate of default while such loans for less than \$200,000 default at a rate that was 83 percent that of the overall rate.

²² Also imbedded in these cells is a factor that relates the default rate to the level of guarantee. Based on findings described earlier in this report, there is reason to expect that the rate of default would decrease by approximately 25 percent if the guarantee level is reduced from 85% to 80%.

²³ For example, the estimated default rate was 4.62% for loans of less than \$150,000 used to finance changes of ownership. This means that the expected total of claims for this category would be 4.62% of the value of loans in this category, \$566 million) reduced by the average claim per dollar (58.82¢ for this category (row 79)). For this category, this works out to be approximately \$15.37 million.

the total claims across the salient loan categories (e.g., \$769 million). This is then expressed as a cost per dollar of loan (e.g., \$0.0549) and its present value equivalent (\$0.0461). Finally the worksheet computes the difference between the total default cost and total fee income to find the net cost to government on a cash basis (e.g. \$126.4 million) and on a present value basis (\$43 million).

Accompanying this report is a diskette containing a Microsoft Excel 7.0/WindowsNT workbook that allows users to investigate any range of scenarios based on the salient parameters described above. Users may accomplish this by inputting their own assumptions on the "SUMMARY" Worksheet in the workbook. The outcomes are then consolidated instantly at the bottom of the SUMMARY Worksheet.

SUMMARY

This study identified the guarantee level, age of firm, sector, use of proceeds, and (perhaps) loan size as factors in defaults on SBLA loans. Based on the portfolio distributions across these factors and the historical default levels for various combinations of eligibility criteria and program parameters simulations of changes to particular parameters were estimated. Based on these simulations, it was found that the likelihood of cost recovery is maximized with reductions in the level of guarantee from 85 to 80 percent (selectively or across the board). Changes to the financing rate also improve the probability of cost recovery.

Changes to the guarantee level have most impact on the lenders, and less direct impact on borrowers. Changes to the financing rate have more direct impact on the borrowers (they must make greater use of alternative means of financing) than on the lenders. The two parameters affect the stakeholders differently, making each take a greater share in the risk. Because both stakeholders would be exposed to more risk with decreases in guarantee and financing levels, default rates would be likely to decrease. Cost recovery would, therefore, be made more likely because government would be less exposed to loss and default frequencies would decrease.

APPENDIX SAMPLE SPREADSHEETS

1	Simulating Income for the SBLA Portfolio							
2								
3	Assumptions:							
4	Historically, SBLA loans have average term of 63 months. A five-year amortization will be assumed.							
5	Per-Dollar Amortization Table							
6	Assumes interest rate of on loan = 8%							
7	Year	Loan Balance	Annual Payment	Interest Payment	Loan Balance			
8		(Opening)			(Closing)			
9								
10	0					1		
11	1		(\$0.25)	\$ 0.080	\$ 0.830			
12	2	\$0.83	(\$0.25)	\$ 0.066	\$ 0.645			
13	3	\$0.65	(\$0.25)	\$ 0.052	\$ 0.447			
14	4	\$0.45	(\$0.25)	\$ 0.036	\$ 0.232			
15	5	\$0.23	(\$0.25)	\$ 0.019	\$ 0.000			
16								
17	<i>Amend amortization table to reflect defaults as per Chart 3</i>							
18	Year	Loan Balance	Annual Payment	Interest Payment	Loan Balance	Annual Defaults	Net Balance	
19		(Opening)			(Closing)			
20								
21								
22	1		(\$0.25)	\$ 0.080	\$ 0.830	0.020	\$0.813	
23	2	\$0.83	(\$0.25)	\$ 0.066	\$ 0.645	0.022	\$0.631	
24	3	\$0.65	(\$0.25)	\$ 0.052	\$ 0.447	0.012	\$0.441	
25	4	\$0.45	(\$0.25)	\$ 0.036	\$ 0.232	0.005	\$0.231	
26	5	\$0.23	(\$0.25)	\$ 0.019	\$ 0.000	0.002	\$0.000	
27								
28	Fee Structure Assumptions:							
29				2% on application		\$1.88		
30				1.25% annually				
31	Estimated fee income per dollar of loan = \$ 0.0465							
32	Present value of fee income (@6%) \$ 0.0435							
33	On a \$14 billion portfolio, this implies estimated income of \$ 650 338 245							
34	With a present value of \$ 609 353 145							
35								
36	Simulating Default Costs							
37	Notional Size of Portfolio \$14 000 000 000							
38								
39	Notional Distribution of Portfolio (as per Panel B of Table 5 and Table 6) broken down by loan size groups.							
40								
41								
42	Loan Purpose		Loan Size		Portfolio Breakdown (\$)			
43			<\$150,000	>\$150,000	<\$150000	>\$150000		
44	Leasehold Improvements		6,65%	5,26%	931 000 000	736 400 000		
45	All other categories		57,94%	30,15%	8 111 600 000	4 221 000 000		
46								
47	Assumptions							
48	<i>(1) Proportion Financed</i>							
49								
50	Loan Purpose		Loan Size					
51			<\$150,000	>\$150,000				
52	Leasehold Improvements		90%		90%			
53	All other categories		90%		90%			
54	<i>(2) Guarantee Level</i>							
55								
56								
57	Loan Purpose		Loan Size					
58			<\$150,000	>\$150,000				
59	Leasehold Improvements		85%		85%			
60	All other categories		85%		85%			
61	<i>(3) Default Rates</i>							
62	Assumed Overall Default Rate = 9%							
63	Distribution of Default Rates (based on data from Tables 5 and 6)							
64	given overall assumption of 9%							
65								
66								
67	Loan Purpose		Loan Size					
68			<\$150,000	>\$150,000				
69	Leasehold Improvements		14,40%		14,22%			
70	All other categories		7,47%		9,27%			
71								
72	Claims History Data							
73	Average Claim per Dollar of Loan							
74	Loan Size Category		<\$150000		>\$150000			
75	Leasehold Improvements		60,31%		62,13%			
76	Other		63,12%		61,52%			
77								
78								
79	Forecast Claims							
80	Loan Size Category		<\$150000		>\$150000			
81	Leasehold Improvements		80 847 542		65 059 297			
82	Other		382 438 466		240 702 483			
83	Total Claims on \$14 billion = 769 047 788							
84	Forecast Loss per Dollar = \$ 0.0549							
85	Present Value of Loss per Dollar = \$ 0.0461							
86	Shortfall on \$14 billion portfolio = \$ 118 709 543							
87	Present value of shortfall = \$ 36 354 207							
88								
89								

