EXPOSURE DRAFT

A METHODOLOGY FOR ESTIMATING COSTS AND SUBSIDIES FROM FEDERAL CREDIT ASSISTANCE PROGRAMS

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Federal direct loans and guaranteed loans totaled $313.9 billion at the end of fiscal year 1978. Credit assistance, in the form of direct loans and loan guarantees, is one way to accomplish Federal program objectives. It is an alternative to such other mechanisms as direct subsidies, tax benefits, and price supports and regulation, by which the Federal Government reallocates resources and induces business firms and individuals to act to achieve policy objectives.

One of the more important and elusive analytical problems associated with credit assistance programs is estimating the interest subsidy provided to assisted borrowers under direct or guaranteed loans. It has generally been assumed that to estimate this subsidy, one needs knowledge or good estimates of what commercial interest rates would have been on loans to program participants in the absence of assistance. Estimates of commercial interest rates may sometimes be incorrect or somewhat unclear. Our methodology estimates what differences probably have existed between subsidized interest rates and commercial rates.

We estimate that Government losses in 1975 on guaranteed loan programs were about 1.3 percent of loans outstanding--about $1.9 billion. For direct loans, losses were about 2.0 percent of loans outstanding--about $1.0 billion. The monetary benefit--subsidies--to borrowers was about 1.4 percent, or about $2.0 billion for guaranteed loans. For direct loans, the subsidy figure was about 2.9 percent, or $1.4 billion.

Our estimates of costs and subsidies do not measure program effectiveness. Such an analysis requires information about whether a particular program is achieving its intended goals, which is beyond this study's scope. Furthermore, the methodology and results shed no light on the extent to which assisted sectors are induced to undertake activity the Federal Government feels is in the public interest (as opposed to doing something they would have done anyway). Nevertheless,

knowledge of costs and subsidies is a first step to answering that important question.

Although our subsidy estimate exceeds the cost estimate, these figures do not include other costs to society of credit assistance, such as using up, or potentially "crowding out" credit that would otherwise have been available in the private sector or increased costs elsewhere in the economy. Cost and subsidy estimates are shown by agency in chapter 4.

This report develops a methodology for estimating costs and subsidies based on measuring the difference between interest rates which would have been charged without Federal credit assistance and interest rates actually charged under Federal credit assistance programs. (See chs. 3 and 4.)

For direct loans by the Government, this interest rate difference consists of three parts:

--Elimination of the "risk premium," which is the interest required by private lenders to compensate for the uncertainty about whether or not a loan may become defaulted. It is the excess interest over what would be charged to a borrower if his likelihood of default were known. The riskier the borrower is thought to be, the higher the risk premium.

--Elimination of the "borrowing differential," which is a cost passed on from private lenders to their borrowers. It arises because private lenders cannot obtain their funds as cheaply as the Federal Government.

--A "direct subsidy," which occurs when the Government sets the interest rate on its loans so low that it loses money on the transaction. Some loans are profitable for the Government, which means that they do not confer this element of subsidy. Nevertheless, the borrower still receives a subsidy composed of the first two elements, net of any Government "profit."

For guaranteed loans, the subsidy is somewhat different. Since guaranteed loans are usually made by private lenders, there is no borrowing differential element. This subsidy is due to eliminating the risk premium, and any losses from the program that result because guarantee fees do not cover Government costs. (See ch. 2.)

This document is a result of our continuing development of methodologies which are thought to be of interest to the Congress, congressional staff, and of use to those in executive agencies who deal with credit assistance programs. Thus, the intended audience is anyone in a position to design, propose, administer, and evaluate credit assistance programs.

The methodology should not be considered as the final word on estimation of costs and subsidies of Federal credit programs. Any questions, comments, and suggestions concerning the document should be directed to Harry S. Havens, Director, Program Analysis Division.

Comptroller General
of the United States

Contents

ABBREVIATIONS

GAO	General Accounting Office
SBA	Small Business Administration

CHAPTER 1

INTRODUCTION

Federal credit programs have grown rapidly in recent years. Loans and guarantees totaled $313.9 billion in fiscal year 1978. Between 1965 and 1975--the years covered by this report--these programs grew by nearly 90 percent, from $124 billion in outstanding loans in 1965 to $233 in fiscal year 1975. Between a third and a fourth of these totals were direct loans, and the rest were guaranteed loans. In 1975, federally assisted lending was 7.7 percent of all debt outstanding, and it was 14.7 percent of new credit advanced.

AIMS OF FEDERAL CREDIT PROGRAMS

The main objective of these programs is to reallocate economic resources to help develop or expand activities such as education, home building, small business, U.S. exports, and energy resource development. This reallocation is accomplished by making credit available on more favorable terms than would otherwise be obtainable in private credit markets. Lower interest rates are the main benefit to borrowers. Other concessions include lower collateral requirements and longer maturities. In addition, some Federal credit programs have helped create deeper secondary markets for certain securities, which helps to lower interest rates.

THE GOALS OF THIS REPORT

The vast array of Federal credit programs provides substantial benefits to assisted borrowers which, as might be expected, add up to substantial costs to taxpayers. The purpose of this report is to (1) develop concepts necessary for estimating the costs to taxpayers and the subsidies to assisted borrowers and (2) estimate those costs and subsidies from the latest available data. More specifically, we attempt to answer the question: what are the annual costs to the Federal Government and what are the annual interest rate reduction benefits to assisted borrowers who received and still hold the outstanding stock of direct and guaranteed loans?

This is an important question for public policy, and certain misconceptions are widespread. There is a tendency to assume that direct and guaranteed loans cost nothing if there is no default, but this is not the case. Regarding benefits, the actual subsidy value of a loan is far less

than the loan's face value, a fact that may be overlooked in comparing loans to direct subsidies.

The office of Management and Budget has presented estimates of subsidies on new loan commitments. Its procedure is to calculate the present value of the differences between interest and payments with an assumed commercial rate and interest payments under Federal credit programs over the life of the loans. Our methodology differs from OMB's because we estimate subsidies on all existing loans outstanding with the goal of determining the total annual monetary benefit in a given year due to the effects of differences between commercial and assisted interest rates from past credit assistance practices. Our methodology does not make explicit assumptions about what commercial rates would have been. Instead, we identify and estimate the components of cost and subsidy and sum them to derive an estimated difference between commercial interest rates and rates to borrowers with Federal credit assistance. The principal advantage of our technique is it is not necessary to know what commercial interest rates would be to derive differences.

SUBSIDIES

In simple terms, the value of the sudsidy depends upon the reduction of interest rates and the size of the loan. If a credit program reduces the interest rate on a $1,000 loan by 2 percent, then the borrower saves $20 a year (before taxes).

Because there are so many credit programs, which offer a wide variety of concessionary terms, there is a great deal of arithmetic necessary to arrive at a total figure. Also, the interest reduction figure is far from exact, for there is no way to determine precisely the interest rate that every borrower would pay without Federal assistance.

Subsidies on all outstanding direct and guaranteed loans were estimated to be 1.8 percent of loans outstanding in 1975 with an annual dollar value of reduced interest payments of $3.4 billion during that year. The interest rate reduction was higher on direct than on guaranteed loans. Total subsidies, however, were greater on guaranteed loans because the amount of guaranteed loans outstanding was nearly three times greater than direct loans. (See table 1.) Our main results are in table 1, and our methodology is in later chapters and the appendixes.

DIRECT COSTS OF FEDERAL CREDIT PROGRAMS

There are two types of costs of Federal credit programs:

--Direct costs to the Government.

--Indirect costs, mainly in the form of economic impact upon unassisted borrowers.

This report deals with only direct costs.

Annual direct costs are definied simply as the gap between income and expenses for all credit programs. Direct costs on outstanding direct and guaranteed loans were estimated to total $2.9 billion, or 1.5 percent of loans outstanding in 1975. These costs as a percent of loans outstanding were greater on direct than on guaranteed loan programs, but, in total, the value of losses were greater on guaranteed loans. (See table 2.)

Table 1
Loans Outstanding and Estimated Subsidies:
Fiscal Year 1975

	Loans outstanding (note a)	Estimated subsidy	Subsidy as percent of loans outstanding
	(billions)		
Guaranteed loans	$142.0	$2.0	1.4
Direct loans	49.2	1.4	2.9
Total	$191.2	$3.4	1.8

a/U.S. Treasury Department, Treasury Bulletin, October 1975, Table G.A., II-2, preliminary. These figures include only those credit programs included in this analysis.

Guarantees should not be thought of as "better" or "worse" than direct loans solely on the basis of their cost. Similarly, the agency-by agency figures presented in chapter 3 do not, by themselves, measure program effectiveness. Program evaluation requires information on whether programs are achieving their objectives, which is outside of this report's

scope. A discussion of our methodology and more detail on costs and subsidy results is included in later chapters and the appendixes.

UNANSWERED QUESTIONS

There are two important questions about Federal credit programs that this report does not attempt to answer. First, how effective are these programs in stimulating the specific types of economic activity that they are meant to encourage? That is, how much investment would have occurred without the credit assistance? A second question concerns the impact of Federal credit programs upon unassisted firms, individuals, or sectors of the economy. Does the subsidized activity displace some other economic activity because of effects on interest rates or the supply of credit?

These questions have not been answered explicitly in economic literature for they pose difficult theoretical questions and empirical problems that differ from program to program. Nevertheless, they are important and should be examined when credit assistance programs are evaluated.

Table 2
Losses on Direct and Guaranteed Loans
Including Costs of Appropriations
Fiscal Year 1975

	Loans outstanding (note a)	Losses	Losses as percent of loans outstanding
	(billions)		
Guaranteed loans	$142.0	$1.9	1.3
Direct loans	49.2	1.0	2.1
Total	$191.2	$2.9	1.5

a/U.S. Treasury Department, October 1975, Treasury Bulletin, Table G.A., II-2, preliminary. These figures include only those credit programs included in this analysis.

SCOPE OF REVIEW

This report is based upon published data on Federal credit assistance programs and Federal and commercial financial variables. Our main sources were:

--The "Treasury Bulletin" and "Federal Credit Programs of the United States Government," both published by the U.S. Department of the Treasury.

--"Appendix A of the Budget of the United States Government," published by the Office of Management and Budget.

--The Central Data Base, Data Resources, Inc.

Because this report does not deal with the goals or the administration of specific programs, we did not interview agency officials.

We attempted to include all credit programs in our review for which data existed over most of the 1965-75 period. The programs covered are listed in appendix II. (See especially table II-1). Our emphasis in on continuing Federal credit assistance programs. Certain direct and guaranteed loan activities are highly discrete in nature. Examples include the Lockheed and Conrail loans. These types of credit assistance are not included in the analyses because our methodology relies on continuous historical data for estimates of costs and subsidies.

CHAPTER 2

COMPOSITION OF COSTS AND SUBSIDIES FROM DIRECT AND GUARANTEED LOANS

Any profit-seeking lender expects the interest rate he or she charges to cover the administrative expenses of origination and servicing, the expected losses arising from defaults, the expected losses associated with market price fluctuations, the opportunity costs of its funds, and its own cost of borrowing. The Federal Government makes direct loans at interest rates below those that private lenders charge. Guaranteed loans are made by private lenders at interest rates which are lower than those that would be charged in the absence of Federal Credit assistance programs, plus a fee or premium which the Government sometimes receives to cover its administrative and insuring activities. If the interest rate which the Government charges on its direct loans or the fee which it requires on guaranteed loans is not high enough to cover its own expenses, the Government incurs losses and taxpayers directly subsidize assisted borrowers.

When borrowers obtain direct loans from the Government or guaranteed loans from private lending institutions at rates of interest below those that would be charged in the absence of the program, they received a subsidy. This interest subsidy is the difference between the rate that would have been charged in the absence of any credit assistance and the

--rate which is actually charged by the Federal Government on direct loans or

--combined guaranteed lending rate and fee which is charged with a guarantee.

There is a difference between the losses incurred by the Government in its lending and guaranteeing operations and the monetary benefits which Federal-assisted borrowers receive. Usually, benefits to borrowers exceed direct costs 1/ because, even if the Government breaks even:

--A loan guarantee reduces the interest rate a private lender charges because it eliminates the need to charge a normal risk premium.

1/Here, and throughout the report, we refer to benefits to the borrower rather than to the broader concept of benefits to the Nation that are generated by the program. The latter concept would be part of a traditional benefit-cost analysis.

--A direct loan can be made at an even lower rate. Not only is the risk premium eliminated, but, in addition, the Government can obtain funds at lower interest rates than private lenders can.

SUBSIDIES ON DIRECT AND GUARANTEED LOANS

Our method of calculating the interest subsidy on direct loans consists of three steps, which are illustrated in figure 1. The components of the subsidy on direct loans are compared with those for guaranteed loans to the same borrower. Since the total subsidy on a direct loan is equal to the dollar savings resulting from the differences between the Federal lending rate and the commercial rate of interest that is avoided because of the program, we believe this difference is made up of the following parts:

1. The losses incurred by the Federal Government which arise because:

   a. The interest rate or guarantee fee charged on the loan by the Federal Government may not be high enough to cover administrative, borrowing, loan origination and servicing, or net default expenses of the program. Private lenders would have to set their rate at least high enough to cover these expenses if they were making loans without Federal backing.

   b. In addition to the money which agencies administering Federal direct loan programs receive through borrowing, other money is received through appropriations in some cases. Such appropriations have a cost about equal to Treasury borrowing rates and must be included in estimating program profits or losses. Private lenders would have to set their lending rates at least high enough to cover these costs if they were making loans with no Federal backing.

2. Private lenders cannot finance their lending operations as cheaply as the Government. Even if the Government charged a break-even rate of interest, a private lender would have to charge a higher rate of interest on its lending to pass through its higher borrowing costs. Other cost differences of administration, loan servicing, and origination may exist between private lenders and the Government. In this analysis, we assume that these differences are negligible.

3. The third component of the subsidy on direct loans is the risk premium. Lenders must receive it because the expected return on any loan is not certain at the time the loan is made. Private lenders tend to undervalue investments (require a rate of return higher than their estimate of expected return) to compensate for this uncertainty.

The risk premium is included in our estimate of the subsidy because we assume that private lenders are risk-averse and require a premium. This distinction is based on the following considerations:

--Private lenders are not in business to break even. Instead, they make loans expecting to make profits in excess of the opportunity costs of their capital investment based on the amount of risk they accept. On the other hand, it is not a function of the Government to intentionally earn risk-adjusted profits from its lending operations but to reallocate financial resources to achieve some social purpose. In fact, some Federal programs are intentionally run at losses in performing this function.

--Second, even if the Government were risk-averse, its programs are so diverse that the risk exposure from all of its lending operations is very minor. On the other hand, private lender portfolios are not as diverse, and, for a given loan, private lenders would require a greater risk premium than the Government.

--Third, even if there were substantial risk exposure from Federal credit programs, the risk is spread over a far larger number of "stockholders" than any private lender could expect to participate in its operations. Ownership of private lending institutions is less widespread, and managers may be directly accountable to owners for operating results.

--Fourth, because of the Government's taxing power, it cannot "go broke" from a run of bad loan experience. Private lenders, on the other hand, cannot recoup losses by decree and may go out of business due to bad loan losses.

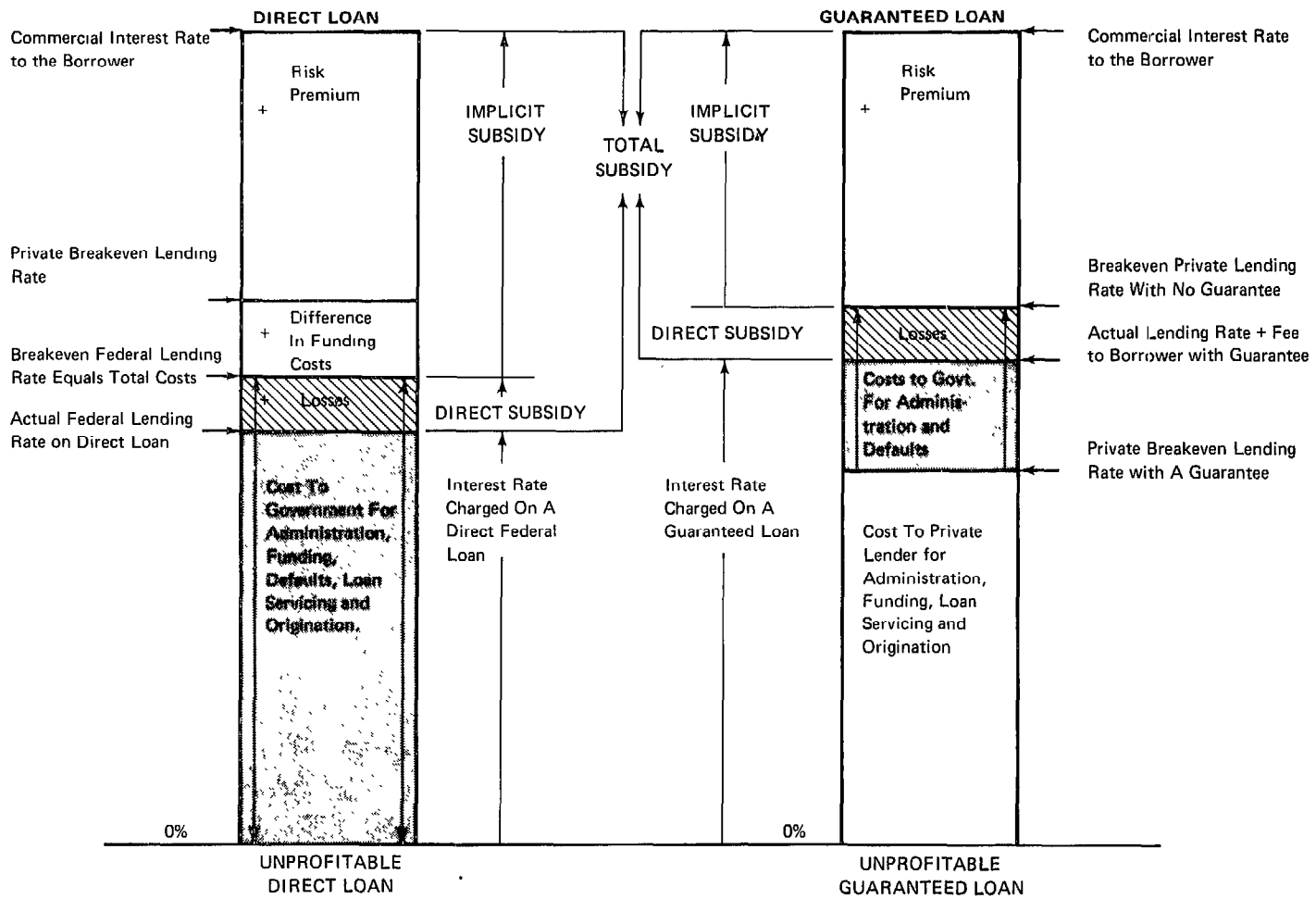
In figure 1, the elements which have been discussed for direct loan costs and subsidies are shown. The avoided commercial rate of interest is shown as equal to the rate of interest charged by the Government, plus additions to that rate which the private lender would have to receive in the

FIGURE 1

COMPONENTS OF THE INTEREST RATE SUBSIDY ON A DIRECT VERSUS GUARANTEED LOAN TO THE SAME BORROWER

(Expressed as a Percent of Principal)

UNPROFITABLE PROGRAM



absence of Federal credit assistance. These additions include the Government's losses (in the case of unprofitable programs), which are the direct costs to the taxpayer from the program; the difference between virtually riskless private and public borrowing rates; and the risk premium. Since the interest subsidy is the difference between the avoided commercial rate and the Government rate, it is defined as the sum of the additions to the Government rate which private lenders would require and that the Government does not require.

The difference between the interest subsidy received on direct and guaranteed loans to the same borrower is due to differing sources of funds. These differences are also shown in figures 1 and 2. Figure 2 differs from figure 1 only because in figure 2 the Government profits from the program. Under loan guarantee programs, the source of funds is private lenders. Because of this, the interest rate charged on a riskless investment will differ from that required by the Federal Government on the same investment to break even. Private lenders supplying funds for riskless investment must charge an interest rate which covers their own borrowing costs (which are higher than the Federal Government's) and which compensates lenders for the opportunity costs of not supplying funds to alternative investments where there is just as much safety of return. We assume this latter cost to be the Government's borrowing rate because its securities are riskless.

The rate of interest to an assisted borrower under a loan guarantee program is the sum of the rate charged by the private lender on the riskless investment and the guarantee fee required by the Government for administering and financing a fund for defaults. The guarantee fee actually charged may or may not adequately finance a reserve for the amount of expected net default losses. If it does, the Government breaks even. If it does not, the Government incurs losses.

The subsidy on guaranteed loans is therefore equal to the differences between the avoided commercial rate and the combined guarantee fee and private interest rate actually charged. In figure 1, the subsidy on an unprofitable loan guarantee program is shown. 1/ It is equal to the losses which the program runs--a direct cost to the taxpayer--and

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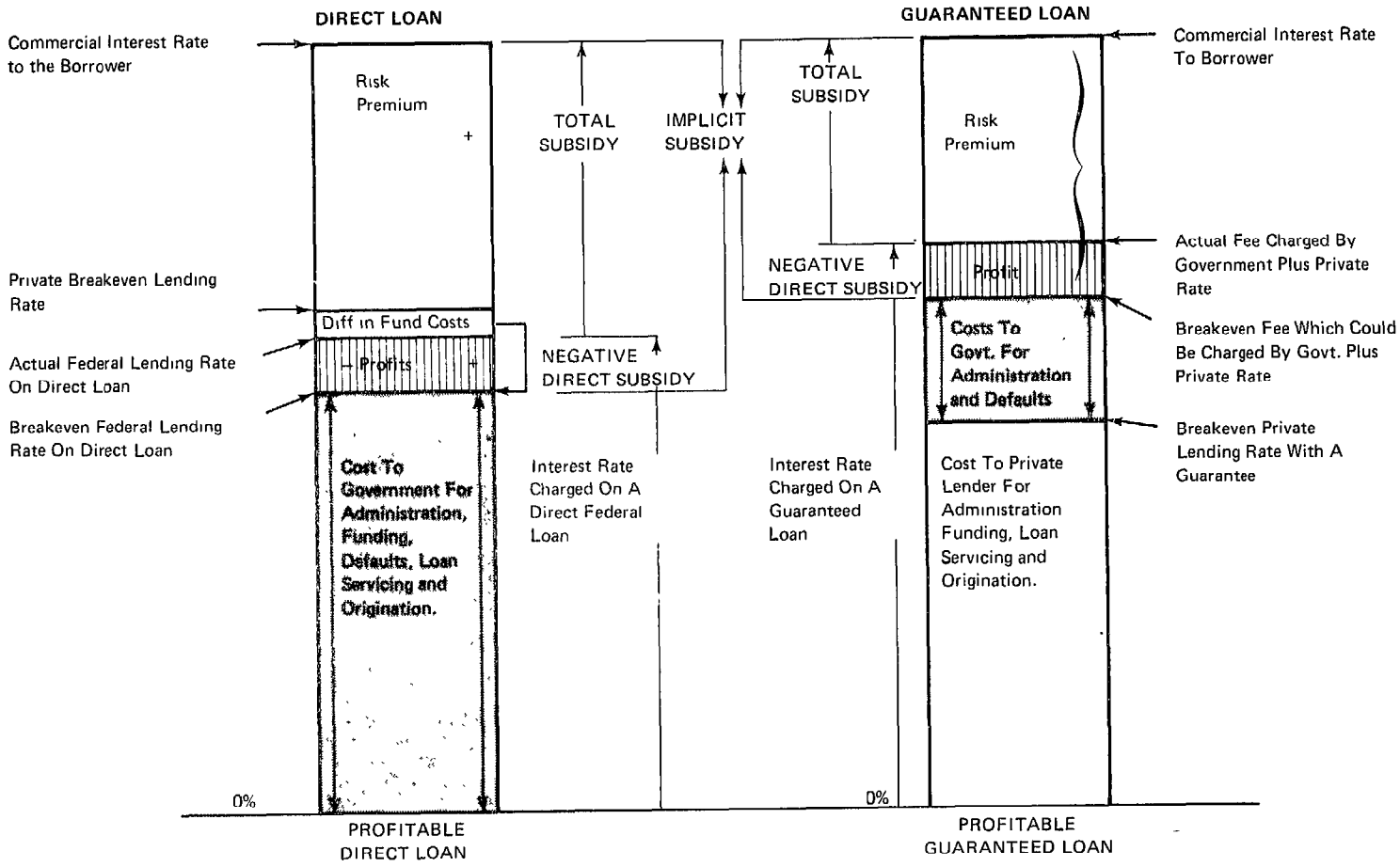
1/In the figure, we assumed that if the loans were unguaranteed, private lending costs would be increased in an amount equal to those incurred by the Government. This implies that there is no duplication of functions between private lenders and the Government in loan guarantee programs.

FIGURE 2

COMPONENTS OF THE INTEREST RATE SUBSIDY ON A DIRECT VERSUS GUARANTEED LOAN TO THE SAME BORROWER

(Expressed as a Percent of Principal)

PROFITABLE PROGRAM



which private lenders would have to cover in the rate which they charge, plus the risk premium which private lenders would require in the absence of the program.

For profitable Federal credit assistance programs, there is a negative direct subsidy and a direct monetary benefit to taxpayers. The total subsidy is composed of the implicit subsidy less the excess of the rate or fee charged over the break even rate or fee. (See fig. 2.) Regardless of whether the program is operated at a profit or a loss, the total subsidy to assisted borrowers is equal to the differences between the commercial rate of interest avoided and the rate actually charged.

There are several characteristics about differences in subsidies between direct and guaranteed loans to the same borrower. First, the avoided commercial rate of interest is independent of the form of assistance the borrower receives. Second, the unassisted private break-even lending rate is independent of the form of assistance provided. Third, assuming the Government wishes to break even or run the same level of losses under either form of assistance, the assisted rate to the same borrower will be higher (and the subsidy lower) on a guaranteed loan than on a direct loan. This is because there are certain costs which private lenders must cover on riskless investments which the Government does not have to cover when it makes direct loans.

This does not mean that subsidies are always greater for direct loan programs. Direct and guaranteed loan recipients have varying risk characteristics within each type of of assistance, and the losses and monetary benefits within each type of program range widely.

In the next chapter, we discuss our methodology and present estimates of each of the subsidy elements on direct and guaranteed loan programs. Appendix II is a discussion of data sources and a tabular presentation of those data. A technical presentation of our methodology, the assumptions made, and interim results are in appendix I. In chapter 4, we estimate the subsidy received under direct loan programs and, with appropriate adjustments, the subsidy received from loan guarantees. These estimates are then combined to measure the total subsidy for all Federal credit assistance programs.

CHAPTER 3

THE COST AND SUBSIDY ELEMENTS: SUMMARY OF METHODOLOGY, DEFINITIONS, AND RESULTS

THE DIRECT SUBSIDY

We estimated the direct subsidies on outstanding direct and guaranteed loans for fiscal years 1965 through 1975. The direct subsidy is composed of two elements: reported losses and nonreported interest costs on funds received by Federal credit programs through the appropriations process. (In some cases, there are profits rather than losses.) The direct subsidy may be expressed as a percentage of outstanding loans.

Data on profit and loss ratios and our estimates of the direct subsidy are presented on an agency-by-agency basis in tables 3 and 4 for fiscal years 1965 through 1975 for the direct and guaranteed loan programs surveyed. The ratio of costs of appropriations to outstanding loans may be inferred from the different totals in the two tables. For example, subtracting the fiscal year 1965 ratio for "President" 1/ in table 4 from the same ratio in table 3 indicates that the ratio of costs of appropriations to outstanding loans for this category during fiscal year 1965 was 2.32 percentage points.

Reported ratios of profits or losses to outstanding loans rose from a profit of 0.15 percent in fiscal year 1965 to a peak of 0.19 percent in fiscal year 1970 and declined thereafter. By fiscal year 1975, reported losses were nearly 1 percent of outstanding loans. The average loss over the entire period was 0.19 percent of outstanding loans.

In some cases, those programs with the greatest increases in losses grew relative to other more profitable programs. Two examples of this are Small Business Administration (SBA) loans and Department of Agriculture programs. SBA loans grew from 1.1 percent of all outstanding loans in fiscal year 1965 to 3.6 percent in fiscal year 1975, while reported losses grew from 4.3 percent of outstandings to an average of around 5.4 percent during the 1970s. Agriculture's programs, mainly in the Farmers Home Administration, grew from 7.8 percent of outstanding loans in fiscal year 1965 to around 13 percent in

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1/Funds appropriated to the President.

fiscal year 1975. These programs were marginally profitable in fiscal year 1965 and had reported losses of 2.2 percent of outstanding loans in fiscal year 1975. Data on relative shares of each agency's outstanding loans for fiscal years 1965 through 1975 are in table II-7 of appendix II.

When costs of appropriations are taken into account, the trend of the direct subsidy is accentuated. This is because we cumulate these costs. For fiscal years 1965 through 1968, these programs virtually broke even or had a small profit. This does not mean that there was no subsidy. Rather, it means that the Government bore no direct costs, on the average, during this period. The assisted borrowers still received a lower interest rate from the Government than they could from a private lender.

After 1968, the direct subsidy grew from .07 percent to around 1.5 percent of the dollar volume of outstanding loans in fiscal year 1975. By fiscal year 1975, the only agency that continued to show a profit was the Export-Import Bank.

"Funds appropriated to the President" is the agency whose reported rate of return is most affected by taking into account the costs of appropriations. For all but one year, the aggregate of these credit programs were reported as profitable. However, when the costs of appropriations are taken into account, there was a direct subsidy in each year.

The average direct subsidy over the fiscal year 1965 through 1975 period was highest for SBA's programs. For SBA's credit programs to have been totally self-supporting, its average lending and guaranteeing rates would have had to be raised by around 6.3 percentage points on its outstanding loans. The President's programs had direct subsidies which averaged between 3 and 4 percentage points. The Department of Health, Education, and Welfare and the Department of Defense had direct subsidies which averaged between 2 and 3 percent of outstanding loans. Departments of Agriculture and the Interior programs had direct subsidies averaging between 1 and 2 percent, and the programs under the Departments of Housing and Urban Development and Commerce had average direct subsidies of less than 1 percent. On the average, programs of the Veterans Administration and the Export-Import Bank were marginally profitable or broke even. The direct subsidy on all Federal credit programs averaged slightly over one-half of 1 percent during the period. This average is heavily influenced by the programs of the Veterans Administration and the Department of Housing and Urban Development because the combined outstanding loans of these two agencies account for about 75 percent of the total.

TABLE 3

Ratio of Reported Profits or Losses to Outstanding Loans
Federal Credit Programs: 1965-1975

Agency	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970
	(percent)					
President	.96	.96	.87	.99	2.24	1.91
Agriculture	.12	.19	.07	-.17	-.79	-.25
Commerce	.53	.93	.05	.54	.39	.00
Defense	.56	1.50	2.21	-5.25	-5.76	-.86
Interior	-2.88	2.39	.94	4.99	2.19	2.50
Veterans Administration	-.08	-.09	.01	.04	.07	.17
Health, Education, and Welfare	.00	.00	.15	.00	-.23	-1.08
Housing and Urban Development	.08	.07	.12	.13	.12	.15
Export-Import Bank	2.33	2.22	2.23	1.97	1.59	1.62
SBA	-4.27	-5.09	-3.17	-3.91	-3.61	-4.64
Weighted Average:	.15	.14	.18	.16	.16	.19

Agency	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975	Average
President	.74	-.47	3.22	.39	2.09	1.26
Agriculture	-1.03	-1.19	-4.75	-2.11	-2.24	-1.10
Commerce	.19	-.53	-1.02	-.10	.21	.10
Defense	4.44	-6.60	-8.94	1.00	-5.68	-2.22
Interior	2.05	1.45	3.31	3.23	2.19	2.03
Veterans Administration	.11	.01	-.07	-.07	-.02	.01
Health, Education, and Welfare	-.87	-.72	-5.40	-2.53	-3.43	1.28
Housing and Urban Development	.06	-.19	-.55	-.91	-1.09	-.18
Export-Import Bank	1.68	1.53	1.51	.99	.62	1.66
SBA	-4.64	-7.27	-5.84	-5.61	-4.34	-4.76
Weighted Average:	-.02	-.37	-.92	-.93	-.95	-.19

TABLE 4

Ratio of Profits or Losses and Opportunity Costs of Appropriations to Loans Outstanding--Federal Credit Programs: 1965-1975

Agency	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970
	(percent)					
President	-1.36	-2.51	-2.59	-3.07	-3.07	-3.45
Agriculture	.11	.08	-.03	-.28	-.93	-.40
Commerce	.16	.52	-.30	.17	-.38	-1.01
Defense	.56	1.50	2.21	-6.25	-5.76	-.86
Interior	-3.03	2.21	.77	4.70	1.71	2.01
Veterans Administration	-.08	-.09	.01	.04	.07	.17
Health, Education, and Welfare	.00	.00	-.86	-3.70	-2.32	-2.24
Housing and Urban Development	.08	.06	.11	.11	.08	.11
Export-Import Bank	2.33	2.22	2.23	1.97	1.59	1.62
SBA	-4.27	-5.09	-3.17	-3.93	-3.67	-5.23
Weighted Average:	.09	.00	.00	-.07	-.19	-.19

Agency	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975	Average
President	-3.22	-4.38	-3.07	-5.79	-3.12	-3.24
Agriculture	-1.15	-1.33	-4.98	-2.40	-2.61	-1.27
Commerce	-.57	-1.17	-1.82	-.90	-.35	-.51
Defense	4.44	-6.60	-8.94	1.00	-5.68	-2.23
Interior	1.72	1.13	2.87	2.49	-5.28	1.03
Veterans Administration	.10	.01	-.07	-.08	-.04	.00
Health, Education, and Welfare	-1.56	-1.30	-6.15	-3.35	-4.26	-2.34
Housing and Urban Development	.03	-.22	-.60	-.97	-1.14	-.22
Export-Import Bank	1.68	1.53	1.51	.99	.62	1.66
SBA	-6.16	-8.97	-10.44	-10.25	-8.43	-6.33
Weighted Average:	-.33	-.69	-1.48	-1.56	-1.52	-.53

The substantial variation in costs among agencies should not be used as a yardstick for reaching conclusions about the relative merits of different programs. The fact that SBA programs ran higher losses than, for example, the Veterans Administration does not mean anything about program effectiveness or management in either agency. We do not know how well either agency is achieving its intended goals; SBA may need to spend more money to achieve its credit allocation objectives than the Veterans Administration would need to achieve its objectives.

When compositional differences between direct and guaranteed loans within each agency are considered, we estimate that the direct subsidy on guaranteed loans is lower than that on direct loans. The average direct subsidy over the fiscal year 1965-75 period and the direct subsidy on loans outstanding in fiscal year 1975 for direct and guaranteed loans is shown below.

Table 5

Direct Subsidy on Direct Versus Guaranteed Loans

Year	Direct loans	Guaranteed loans
	(percent)	
Average for FY 1965-75	1.21	0.29
FY 1975	2.08	1.32

It does not follow from these results that loan guarantees are better policy instruments than direct loans because they are "less costly" to the Government. Other things must be considered not the least of which are the advantages of direct versus guaranteed loans in achieving their intended purposes. Program effectiveness cannot be assessed in the aggregate, but only program by program.

THE BORROWING DIFFERENTIAL

We define the borrowing cost differential to be the average difference between the rate at which the highest rated private lenders can borrow and the rate at which Government can borrow.

The average borrowing cost differential (which exists because the Federal Government can finance a lending operation at lower interest rates than a private lender)

was estimated for the period from 1947 through 1975. The estimate was calculated for this period because some loans which were outstanding between 1965 and 1975 may have originated as early as 1947 and because the subsidy due to the borrowing differential occurs and continues based on interest rates avoided at the time loans are made.

In estimating the borrowing cost differential, it was considered desirable to compare interest costs on long- and short-term Government borrowings with interest rates on private securities whose difference from Government securities is minimized. The borrowing cost differential is not intended to measure specific or "company" related risks of private risky borrowers. Instead, it measures the difference between Federal borrowing rates and borrowing costs for private institutions whose default risk is low. Such differences arise due to traditional or institutional factors between Federal and prime-rated borrowers' securities. These include the depth of secondary trading markets and the fact that the Government will not default on its indebtedness while even the highest rated private borrower may.

Our measure of Federal borrowing costs for the financing of direct loan programs is a simple average of 3-month Treasury bill rates and rates of interest on Treasury bonds with maturities exceeding 10 years. Our measure of private borrowing costs is a simple average of the money rate on 4-to-6-month prime commercial paper and the yield on Moody's AAA Corporate Bonds.

The borrowing cost differential was calculated as a simple average of differences between short- and long-term private and Government borrowing rates. Because the differential is calculated from interest rates on private and Federal securities of roughly the same maturity, the estimate should not reflect interest rate differences resulting from market price fluctuations, particularly in the longer term maturities.

We estimate that the average difference between Federal and private borrowing costs is 60.8 basis points for the period between 1947 and 1975.

THE RISK PREMIUM

We have presented estimates of the direct subsidy and the borrowing differential which exists because private lending operations cost more than Federal lending operations. The sum of these two estimates is the difference between the

rate of interest that the private sector would have required to cover costs (including opportunity costs) and the rate of interest that the Government has charged on its direct loans. The borrowing differential is absent for loan guarantees. The direct subsidy is our estimate of the amount by which private lenders would have had to raise interest rates in the absence of the guarantees to just cover costs.

Estimates of the risk premium on direct and guaranteed loans were obtained by:

--Developing a measure of risk for the typical program administered by each of the agencies included in this analysis.

--Estimating private lender desired rates of return at various levels of risk.

--Calculating the risk premium that private lenders would have required on the outstanding loans when these loans were originated, given our estimated risk levels for the typical programs and the rate of return that private lenders have historically required for those levels of risk.

Our methodology is briefly summarized below.

The measure of risk for Federal credit programs was defined as the average variance in the ratio of profits and losses and costs of appropriations to loans outstanding for the "typical" program administered by each of the Federal agencies included in the survey. (See table 4.) We estimated the variance of returns for the total Federal portfolio using conventionally accepted measures of portfolio variance. In doing this, we obtained measures of variance for each agency and then, with the assumptions described in appendix I, estimated the variance in profit or loss for the typical program administered by each agency. It was necessary to make assumptions to calculate program variance because the data on individual agency programs were not available except on a fund-by-fund basis and these data were neither consistent nor continuous for the 1965 to 1975 period. Thus, program variance could not be directly measured. Program variance is a more relevant risk measure than agency variance because it better approximates risk for individual loans. It is the risk on individual loans which private lenders evaluate (whether in a portfolio context or not) when establishing required interest rates.

The next step was to estimate how private lenders have historically responded to risk. This was necessary because our objective is to estimate how private lenders would have responded to risk associated with Federal credit program loans. We estimated this relationship by comparing returns on Moody's AAA through BAA Corporate and Industrial bonds and returns on the Standard & Poors Composite and Industrial Indexes with their variance in returns between 1941 and 1971. The relationship was estimated using bivariate regression techniques designed to estimate a simple historical mean-variance returns model.

The risk premium that would have been required in the absence of Federal credit assistance was calculated by plugging estimates of Federal credit program variance into the estimated historical return-variance relationship.

Presented in Table 6 is the estimated risk premium and the average annual dollar value of benefits for the 1965 to 1975 period on outstanding direct and guaranteed Federal loans which arise from avoidance of risk premiums. In Table 7, the same results are shown for 1975.

The dollar value of benefits from guaranteed loan programs due to avoided risk premiums averaged $50.4 million per year from 1965 to 1975. This savings was .05 percent of guaranteed loans outstanding. By the end of 1975, the dollar value of benefits from avoided risk premiums was estimated to be $126.5 million on guaranteed loans or a savings of .09 percent. Risk premiums avoided on direct loans were higher than on guaranteed loans. In 1975, because the dollar value of direct loans outstanding was much lower than guranteed loans, the value of savings from direct loan programs has been lower. The avoided risk premium on direct loans averaged 0.19 percent between 1965 and 1975. In 1975, it was 0.18 percent.

Table 6

Risk Premium and Average Dollar Value
of Benefit from Avoidance of Risk Premiums
(Average For All Years)

Agency	Direct Loans			Guaranteed Loans		
	Outstanding loans	Risk premium	Dollar value of benefit	Outstanding loans	Risk premium	Dollar value of benefit
	(000 omitted)	(percent)	(000 omitted)		(percent)	(000 omitted)
President	$6,834,522	.135	$ 9,227	$ 231,775	.135	$ 313
Agriculture	8,981,362	.306	27,483	4,381,771	.306	13,408
Commerce	453,147	.049	222	928,819	.049	455
Defense	10,376	1.158	120	8,802	1.158	102
Interior	27,310	.449	123	0	.449	0
Veterans Administration	1,060,326	.001	11	20,490,999	.001	205
Health, Education, and Welfare	1,218,060	.391	4,763	1,435,666	.391	5,613
Housing and Urban Development	9,060,826	.030	2,718	69,866,225	.030	20,960
Export-Import Bank	5,664,183	.027	1,529	1,847,000	.027	499
SBA	2,189,535	.900	19,706	990,618	.900	8,915
Total	$35,479,647	.186	$65,902	$100,181,675	.050	$ 50,470

Table 7

Risk Premium and Average Dollar Value
of Benefit from Avoidance of Risk Premiums
(Fiscal year 1975)

Agency	Direct Loans			Guaranteed Loans		
	Outstanding loans	Risk premium	Dollar value of benefit	Outstanding loans	Risk premium	Dollar value of benefit
	(000 omitted)	(percent)	(000 omitted)		(percent)	(000 omitted)
President	$10,852,894	.135	$14,651	$ 368,047	.135	$ 497
Agriculture	9,846,094	.306	30,129	15,182,106	.306	46,457
Commerce	923,379	.049	452	2,080,158	.049	1,019
Defense	3,732	1.158	43	0	1.158	0
Interior	36,497	.449	164	0	.449	0
Veterans Administration	488,712	.001	5	28,140,076	.001	281
Health, Education and Welfare	1,917,158	.391	7,496	4,563,197	.391	17,842
Housing and Urban Development	12,719,138	.030	3,815	84,299,458	.030	25,290
Export-Import Bank	9,391,601	.027	2,535	3,628,780	.027	980
S.B.A.	3,014,855	.900	27,133	3,796,836	.900	34,171
Total	$49,194,060	.176	$86,423	$142,058,658	.090	$126,537

CHAPTER 4

THE ANNUAL INTEREST RATE SUBSIDY

ON OUTSTANDING GUARANTEED AND DIRECT LOANS

In chapter 3, we described how we estimated each component of the interest subsidy to program beneficiaries from Federal credit assistance. In this chapter, we sum up estimates in various ways to obtain estimates of the total subsidy.

THE AVERAGE ANNUAL SUBSIDY BETWEEN 1965 and 1975

The average interest rate subsidies estimated for guaranteed loans, direct loans and their combined total are presented in Tables 8 through 10.

Between 1965 and 1975, recipients of guaranteed loans paid average annual interest rates about 34 basis points (0.34 percent) less than they would have paid without Federal credit assistance. (See table 8.) Program beneficiaries enjoyed an annual savings of about $340 million. Of this interest savings, most are due to the losses incurred by the Federal Government in providing credit assistance.

It is estimated that direct loan recipients paid interest rates 2.01 percentage points below what they would have otherwise paid. (See table 9.) This total subsidy converts to an annual average savings of about $714 million. Of this total savings, Government losses accounted for $429 million, and the borrowing differential of 61 basis points accounted for $216 million and the risk premium of 19 basis points for $67 million. The overall total subsidy from both forms of credit assistance was 78 basis points (0.78 percent), with 53 basis points accounted for by Government losses. Total average annual savings from both forms of credit assistance was about $1.1 billion. (See table 10.)

These averages are dominated by large numbers of housing loans, particularly in the form of guaranteed loans. Assuming that most loans made or guaranteed by the Departments of Agriculture, and Housing and Urban Development, and the Veterans Administration are for housing, then netting out these results changes the subsidy estimates considerably. The total subsidy and each of its components netted of the effect of agencies with housing programs are shown in the following table for guaranteed and direct loans and for all credit assistance.

Table 8

Total Interest Rate Subsidy
on Guaranteed Loan Programs
(Average for All Years)

Agency	Loans outstanding	Direct subsidy	Risk premium	Total subsidy	Value of benefits
	(000 omitted)	(percent)			(000 omitted)
President	$ 231,775	3.24	.14	3.38	$ 7,834
Agriculture	4,381,771	1.27	.31	1.58	69,232
Commerce	928,819	.51	.05	.56	5,201
Defense	8,802	2.22	1.16	3.38	298
Interior	0	-1.03	.45	- .58	0
Veterans Administration	20,490,999	0	0	0	0
Health, Education, and Welfare	1,435,666	2.34	.39	2.73	39,194
Housing and Urban Development	69,866,225	.22	.03	.25	174,665
Export-Import Bank	1,847,000	-1.66	.03	1.63	- 30,106
SBA	990,618	6.33	.90	7.23	71,622
Total/weighted average	$100,181,675	.29	.05	.34	$ 337,940

Table 9

Total Interest Rate Subsidy
on Direct Loan Programs
(Average for All Years)

Agency	Loans outstanding	Direct subsidy	Borrowing differential	Risk premium	Total subsidy	Value of benefits
	(000 omitted)	(percent)				(000 omitted)
President	$ 6,834,522	3.24	.61	.14	3.99	$272,697
Agriculture	8,981,362	1.27	.61	.31	2.19	196,692
Commerce	453,147	.51	.61	.05	1.17	5,302
Defense	10,376	2.22	.61	1.16	3.99	414
Interior	27,310	-1.03	.61	.45	.03	8
Veterans Administration	1,060,326	0	.61	0	.61	6,468
Health, Education, and Welfare	1,218,060	2.34	.61	.39	3.34	40,683
Housing and Urban Development	9,060,826	.22	.61	.03	.86	77,923
Export-Import Bank	5,664,183	1.66	.61	.03	-1.02	-57,775
SBA	2,189,535	6.33	.61	.90	7.84	171,659
Total/weighted average	$35,499,647	1.21	.61	.19	2.01	713,542

Table 10

Total Interest Rate Subsidy
Federal Credit Programs
(Average for All Years)

Agency	Direct Loans			Guaranteed Loans		
	Loans outstanding	Direct subsidy	Borrowing differential	Risk premium	Total subsidy	Value of benefits
	(000 omitted)	(percent)				(000 omitted)
President	$ 7,066,297	3.24	.59	.14	3.97	$ 280,532
Agriculture	13,363,133	1.27	.41	.31	1.99	265,926
Commerce	1,381,966	.51	.20	.05	.76	10,503
Defense	19,178	2.22	.33	1.16	3.71	712
Interior	27,310	-1.03	.61	.45	.03	8
Veterans Administration	21,551,325	0	.03	0	.03	6,468
Health, Education, and Welfare	2,653,726	2.34	.28	.39	3.01	79,877
Housing and Urban Development	78,927,051	.22	.07	.03	.32	252,567
Export-Import Bank	7,511,183	-1.66	.46	.03	-1.17	-87,881
SBA	3,180,153	6.33	.42	.90	7.65	243,281
Total/weighted average	$ 135,681,312	.53	.16	.09	.78	$1,051,993

Interest Rate Subsidies Net of Housing Programs:
(Average for All Years)

	Outstanding loans	Direct subsidy	Borrowing differential	Risk premium	Total subsidy
	(000 omitted)		(percent)		
Guaranteed	$ 5,442,680	1.43	0.00	.29	1.72
Direct	16,397,133	1.81	.61	.22	2.64
Total/weighted average	$21,839,813	1.71	.46	.24	2.41

When the effect of housing loans is deleted, the total subsidy on all other types of loans is 2.41 percentage points, or 1.63 percentage points higher than on all loans. The major difference occurs within the guaranteed loan category. The subsidy on nonhousing guaranteed loans is 1.72 percent--nearly 1.4 percentage points higher than on all guaranteed loans.

ANNUAL SUBSIDIES IN 1975

The subsidy on guaranteed loans was estimated to be 1.41 percent in 1975, more than a percentage point increase over its average between 1965 and 1975. Most of this increase is accounted for by increasing loss rates to the Government, though the risk premium also nearly doubled. By 1975, the annual average savings to recipients of guaranteed loans was about $2.0 billion. (See table 11.)

The subsidy on direct loan programs did not increase nearly as much as that on guaranteed loans, and all of the 0.86 percentage point increase over the average was accounted for by increased Government losses. In 1975, direct loan recipients had an annual average savings of about $1.4 billion and an interest rate savings of 2.87 percentage points. (See table 12.)

The subsidy in 1975 increased over its average for several reasons. First, losses by the Government increased from an average rate of 0.53 percent between 1965 and 1975 to 1.52 percent by 1975. Most notably, losses for the Department of Housing and Urban Development increased from an average of 0.22 percentage points to 1.14 percentage points in 1975. Second, relatively low subsidy housing loans though still dominant, declined as a percent of the total loans outstanding while other types of loans with higher

Table 11

Total Interest Rate Subsidy on Guaranteed Loan Programs: (Fiscal Year 1975)

Agency	Loans outstanding	Direct subsidy	Risk premium	Total subsidy	Value of benefits
	(000 omitted)	(percent)			(000 omitted)
President	$ 368,047	3.12	.14	3.26	$ 11,998
Agriculture	15,182,106	2.61	.31	2.92	443,317
Commerce	2,080,158	.35	.05	.40	8,321
Defense	0	5.68	1.16	6.84	0
Interior	0	5.28	.45	5.73	0
Veterans Administration	28,140,076	.04	0	.04	11,256
Health, Education, and Welfare	4,563,197	4.26	.39	4.65	212,189
Housing and Urban Development	84,299,458	1.14	.03	1.17	986,304
Export-Import Bank	3,628,780	-.62	.03	-.59	-21,410
SBA	3,796,836	8.43	.90	9.33	354,245
Total/weighted average	$142,058,658	1.32	.09	1.41	$2,006,220

Table 12

Total Interest Rate Subsidy
on Direct Loan Programs:
(Fiscal Year 1975)

Agency	Loans oustanding	Direct subsidy	Borrowing differential	Risk premium	Total subsidy	Value of benefits
	(000 omitted)	(percent)				(000 omitted)
President	$10,852,894	3.12	.61	.14	3.87	$ 420,007
Agriculture	9,846,094	2.61	.61	.31	3.53	347,567
Commerce	923,379	.35	.61	.05	1.01	9,326
Defense	3,732	5.68	.61	1.16	7.45	278
Interior	36,497	5.28	.61	.45	6.34	2,314
Veterans Administration	488,712	.04	.61	0	.65	3,177
Health, Education, and Welfare	1,917,158	4.26	.61	.39	5.26	100,843
Housing and Urban Development	12,719,138	1.14	.61	.03	1.78	226,401
Export-Import Bank	9,391,601	-.62	.61	.03	.02	1,878
SBA	3,014,855	8.43	.61	.90	9.94	299,677
Total/weighted average	$49,194,060	2.08	.61	.18	2.87	$1,411,468

Table 13

Total Interest Rate Subsidy
Federal Credit Programs
(Fiscal Year 1975)

Agency	Loans outstanding	Direct subsidy	Borrowing differential	Risk premium	Total subsidy	Value of benefits
	(000 omitted)	(percent)				(000 omitted)
President	$ 11,220,941	3.12	.59	.14	3.85	$ 432,006
Agriculture	25,028,200	2.61	.24	.31	3.16	790,891
Commerce	3,003,537	.35	.19	.05	.59	17,721
Defense	3,732	5.68	.61	1.16	7.45	278
Interior	36,497	5.28	.61	.45	6.34	2,314
Veterans Administration	28,628,788	.04	.01	.00	.05	14,314
Health, Education, and Welfare	6,480,355	4.26	.18	.39	4.83	313,001
Housing and Urban Development	97,018,596	1.14	.08	.03	1.25	1,212,732
Export-Import Bank	13,020,381	-.62	.44	.03	-.15	-19,531
SBA	6,811,691	8.43	.27	.90	9.60	653,922
Total/weighted average	$191,252,718	1.52	.16	.10	1.79	$3,417,648

subsidies grew. Subsidies on nonhousing loans calculated in the same manner as the 1965-1975 average are shown below.

Interest Rate Subsidies Net of Housing Programs:
(Fiscal Year 1975)

	Outstanding loans	Direct subsidy	Borrowing differential	Risk premium	Total subsidy
	(000 omitted)		(percent)		
Guaranteed	$14,437,018	3.54	0.00	.36	3.92
Direct	26,140,116	2.38	.61	.20	3.19
Total/ weighted average	$40,577,134	2.79	.39	.26	3.44

The total subsidy on nonhousing loans was 3.44 percent, compared with a subsidy of about 1.8 percent on all Federal credit programs in 1975.

The data provides some comfirmation that nonhousing loans are more risky than housing loans. During the 1965-75 period, risk premiums averaged 24 basis points for nonhousing loans. This compares with an average of 9 basis points on all loans. In 1975, the risk premium on nonhousing loans averaged 26 basis points as compared with 10 basis points for all loans. Also, in the nonhousing loan category, risk premiums on guaranteed loans exceeded those on direct loans both on the average and in 1975. The risk premium on direct nonhousing loans was slightly lower in 1975 as compared with its average between 1965 and 1975. The risk premium on nonhousing guaranteed loans rose from an average of 29 basis points to 38 basis points in 1975. These patterns tend to indicate that guaranteed loans are increasingly used to finance activities that are not only more risky than housing loans but also may be more risky than activities financed by direct loans.

METHODOLOGY, ASSUMPTIONS, AND INTERMEDIATE RESULTS

In this appendix, we present information on our approach in estimating the three components of the subsidy element in Federal credit programs, the assumptions made, and some of the intermediate results which were obtained.

THE DIRECT SUBSIDY

We defined the direct subsidy to be the ratio of reported profits or losses to outstanding loans, plus the ratio of nonreported interest costs of appropriations to outstanding loans. This component of the subsidy was estimated with the following formula:

$$S_{D_t} = \frac{\$P_t + ((\sum_{t=1}^{t} A_t) \times (R_{b_t} + R_{n_t})/2)}{\$O_t} \quad (t=1, 1965; t=11, 1975)$$

Where:

S_{D_t} = the direct subsidy in year t.

$\$P_t$ = the profit or loss to a particular agency from its lending or guaranteeing operations in year t.

$\sum_{t=1}^{t} A_t$ = the cumulative sum of appropriations received by a particular agency for credit programs from 1965 to year t.

R_{b_t} = the average interest rate on 3-month Treasury bills in year t.

R_{n_t} = the average interest rate on 3 to 5 year Treasury notes in year t.

$\$O_t$ = the dollar volume of outstanding direct and guaranteed loans for a particular agency in year t.

We used a simple average of current short-and intermediate-term interest rates in our definition of nonreported expenses associated with appropriations for several reasons:

--Most Treasury borrowing was confined to these maturity sectors during this period.

--Current, rather than historical, rates were used because of the relatively short-term nature of outstanding Federal indebtedness and because outstanding indebtedness is to some extent a determinant of the costs of new Federal borrowing.

The rationale for this measure is that with no appropriations, the direct subsidy would simply be the ratio of reported profits or losses from an agency's lending or guaranteeing operations to total loans outstanding. This is the average amount by which lending rates and guarantee fees would have to be raised in any year on the stock of then outstanding loans for the agency to break even. But if the agency also received funding through the appropriations process, additional costs are incurred by the Government. We have used interest costs associated with the cumulative sum of appropriations beginning in 1965 in the estimates because there is no reason to assume that these appropriations are "paid back" and used to retire the outstanding indebtedness of the Government. To the extent that programs in existence before 1965 received appropriations since their beginning, our data on appropriations understate the amount of funding that these programs have received through the appropriations process and the interest costs of those appropriations.

There is another way to view inclusion of the costs of appropriations in the subsidy estimate. If they are not part of the direct subsidy, they must certainly be considered as a cost that would be incurred by private lenders if they were making these loans. Since our goal is to determine what the rate of interest on loans made or guaranteed under Federal credit programs would have been without Federal assistance, the cost of appropriations can also be viewed as the cost that a private lender would have incurred in funding its lending operations if it could borrow as cheaply as the Treasury. This is the opportunity cost of lender-supplied capital. The rate of interest that a private lender would require would reflect these costs. Thus, including costs of appropriations as part of the direct subsidy or borrowing differential leaves the total subsidy unchanged.

THE BORROWING DIFFERENTIAL

We defined the borrowing differential as the average difference which has existed between the rate at which the highest rated private lender can borrow and at which the Government can borrow. This part of the subsidy was estimated with the following formula:

$$R_B = \sum_{t=1}^{N} ((R_{AAA_t} + R_{CP_t})/2 + (R_{b_t} + R_{l_t})/2)/N \quad (t=1,\ 1/47,\ t=N,\ 2/75)$$

Where: R_{AAA_t} = The AAA Corporate Bond rate in month t.

R_{CP_t} = The 4-to-6-month prime commercial paper rate in month t.

R_{b_t} = The 3-month Treasury bill rate in month t.

R_{l_t} = The interest rate on long-term Treasury bonds in month t. 1/

This measure of the borrowing differential is only an approximation of the true rate. Federal direct loan programs have been financed through (1) appropriations for operating expenses or (2) agency borrowing from the Treasury and, more recently, the Federal Financing Bank, or (3) from the private money and capital markets for lending requirements. Treasury borrowing to fund programs through the appropriations process or to satisfy agency borrowing requirements is done at the lowest rate of interest. Agency borrowing from the Federal Financing Bank is done at a slightly higher rate. And agency borrowing on its own behalf in the private money and capital markets is done at a higher rate.

It would have been desirable to obtain a measure of interest rates on Federal budget agency securities. Unfortunately, we were not able to obtain these data for the years before 1972. Failure to incorporate this rate into the calculation probably results in some overstatement of the borrowing differential. In addition, Federal Financing Bank rates to borrowing agencies have ranged from 3/8 to 1/8 percentage point markup over Treasury borrowing rates in

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1/When yields on long-term Treasury Bonds exceeded 4-1/4 percent, this rate was netted of yields on so-called Flower Bonds. It might be recalled that calculations of interest costs associated with appropriations used short- and intermediate-term rates. We use short- and long-term Treasury rates to calculate the borrowing differential so as to match Federal and private borrowing maturities and eliminate any differences due to market price fluctuations.

comparable maturity ranges since it began operations in 1974. However, Federal Financing Bank financings of agency direct loan programs were not a substantial portion of agency outstanding loans before 1975 (the end of the period of analysis). Thus, failure to include some sort of markup on Federal borrowing costs because of Federal Financing Bank activity is not considered a serious omission.

We assumed that the borrowing cost differential is the same for all agencies. Aside from the fact that the estimate does not include interest rates on agency securities (and, thus, differences in costs due to financing mix), it also is calculated on the assumption that the maturity structure of funding for all Federal agencies is the same. We do not have information on either the maturity structure of agency financing or the source of funding mix for agency direct loan programs.

Also implicit in our borrowing differential calculation is the assumption that the maturity structure of Federal and private funding is equally distributed between short- and long-term securities. This, in turn, implies that the maturity structure of Federal borrowing to finance direct loan programs is identical to that which private lenders would have chosen had they made the loans.

These assumptions result in an estimate which is an abstraction from reality, but this is unavoidable. Analysis of the maturity structure and financing mix of agency and private lenders debt between 1947 and 1975 is beyond this report's scope.

At the extreme, if all Federal financing for direct loan programs had been done with short-term Treasury bills and all private financing had been done with long-term securities, the borrowing differential would be about 140 basis points (1.4 percent). If the reverse were true, the borrowing differential would be about -32 basis points (-.32 percent).

THE RISK PREMIUM

Dispersion of returns to Federal credit programs

Estimates of the risk premium that would be required by private lenders are based on the following assumptions:

1. Variance of returns is an appropriate measure of risk.

2. In the private sector, more return is preferred to less, but less variation in returns is preferred to more. Private lenders are indifferent to varying combinations of return and dispersion with higher levels of dispersion associated with higher returns.

These assumptions are based on the more fundamental assumption that the marginal utility of wealth disminishes as wealth increases. This means that more wealth is preferred to less, but the satisfaction that one gets from an incremental increase in wealth is less than the dissatisfaction that one experiences from an equal incremental decrease in wealth. To a large extent, risk is a function of potential downside losses, and an appropriate measure of the range of these losses is variance.

We also assume that the Government is virtually risk-neutral. This means that more return is preferred to less, but that the dispersion of returns is not important. We assume that the marginal utility of wealth is constant for the Government.

The implications of diminishing and constant marginal utilities of wealth for risk-averse and risk-neutral behavior, respectively, are given without proof. 1/

The way that these propositions affect the risk premium required by private lenders and the relationship of this risk premium to the total subsidy in Federal credit programs is shown in figure I-1. This figure is similar to figures 1 and 2 in the main body of the report except that the effect of risk (as measured by variance in returns) on the private lender's desired rate of return is made explicit. Desired return is measured along the vertical axis and the dispersion of returns is measured along the horizontal axis. The figure shows hypothetical relationships between the average Government lending rate (A), an indifference curve (I_1) for the

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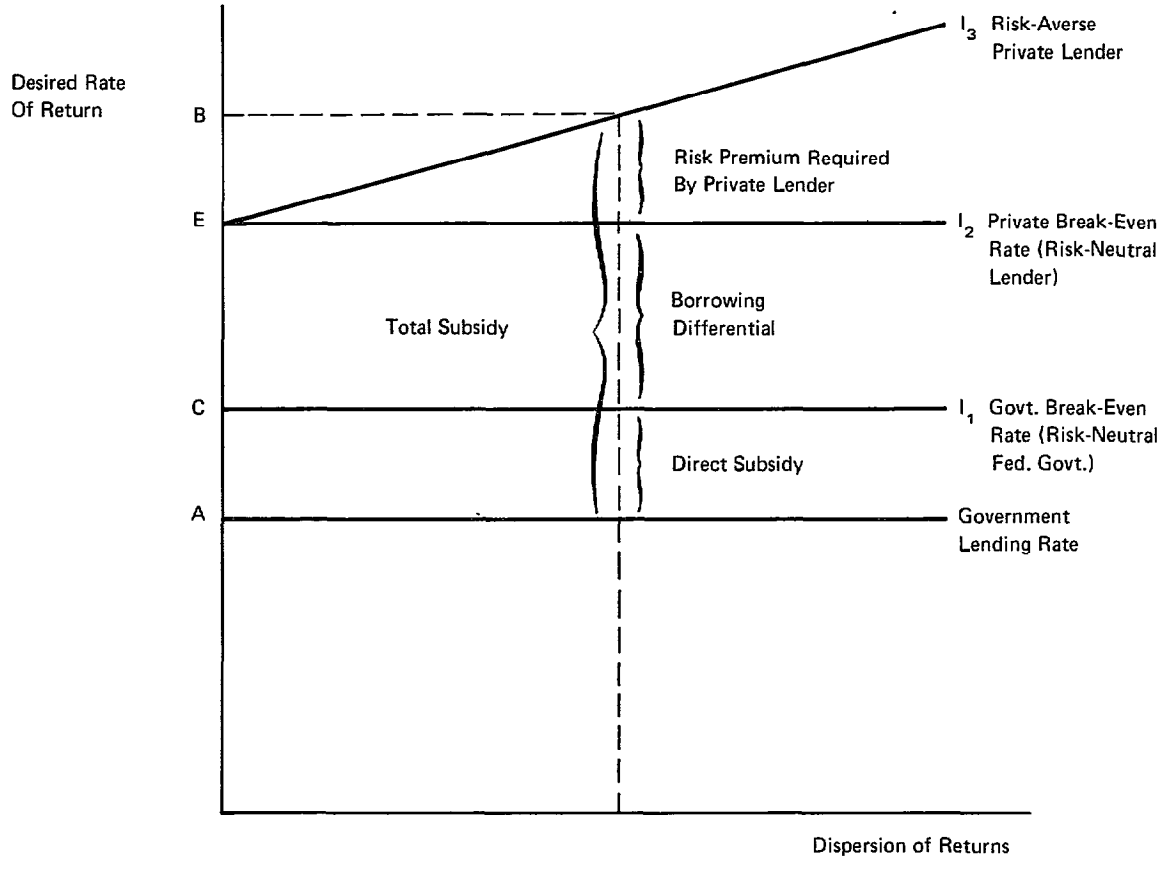
1/The interested reader is referred to The Theory of Finance, E. F. Fama and M. H. Miller (Holt, Reinhart, Winston: New York, 1972), for a description of the relationships, as well as a more complete elaboration of the rationale, for the measures of variance and risk premiums used in this study.

FIGURE A-1
COMPONENTS OF THE SUBSIDY
FEDERAL CREDIT PROGRAMS



risk-neutral Federal Government at its breakeven lending rate (C), an indifference curve (I_2) for a risk-neutral private lender at its break-even lending rate (E), and an indifference curve for a risk-averse private lender (I_3). These indifference curves map combinations of risk and return that yield the same amount of utility or satisfaction.

Risk-neutrality is shown by horizontal indifference curves because utility is unaffected by the dispersion of returns but increases with increasing returns. Therefore, for risk-neutral lenders, there is only one level of utility associated with each return. Any higher rate of return would mean a higher level of utility and, by the definition of indifference curves, would be depicted by a higher indifference curve. Curve I_3 maps hypothetical combinations of risk and return that produce a constant level of utility for the risk-averse private lender.

At point E, the break-even point for private lending operations, the rate of return desired by the risk-neutral private lender is the same as that desired by the risk-averse private lender when returns are certain. Whenever there is variation in returns, the rate required by a risk-averse lender will exceed the rate required by a risk-neutral lender. Curve I_3 is positively sloped to reflect the proposition that for risk-averse private lender satisfaction to remain constant, higher dispersion in returns must be compensated with higher actual returns.

In the case of guaranteed loans, Figure I-1 needs to be altered to eliminate the presence of the borrowing differential. Curve I_3 should intersect the vertical axis at point C to reflect the assumption that increased borrowing costs should be reflected in the rate of interest which a private lender requires with a Government guarantee.

To estimate the risk premium, answers were sought to the following questions:

1. What has been the variance in returns for Federal credit programs? In view of the fact that variance can be measured at various levels of aggregation (for example, the total Federal level, the agency level, the program level, or the individual loan level), what is the most appropriate measure for the purpose at hand?

2. How have private lenders historically responded to risk in terms of their desired rate of return? If an historical relationship exists between desired returns and dispersion, has it been stable?

The estimates of Federal credit program return dispersion were derived using a portfolio approach to calculating variance. Each Federal credit agency was treated as if it were making a contribution to the return and variance of an aggregate Federal credit portfolio. This was done because it facilitates development of the full range of measures of dispersion. Variance was estimated at the highest level of aggregation, at the agency level, and, with some assumptions based on portfolio considerations, at the program level.

An accepted measure of the variance in returns to a portfolio of financial assets is given by:

$$(1) \quad \sigma^2(R_p) = \sum_{i=1}^{A} \sum_{j=1}^{A} x_i \cdot x_j \, \sigma_{ij} \quad \text{for all } i=j,\ i \neq j$$

$$t=\bar{t}$$

Where:

R_p = the return to the portfolio of financial assets.

$\sigma^2(R_p)$ = the variance in returns to the portfolio.

$x_i \cdot x_j$ = the proportion of the total value of outstanding securities held by agency i times the proportion held by agency j at time $t = \bar{t}$.

σ_{ij} = the covariance in returns between agency i and agency j, or the variance in returns to agency i over time t.

Where: σ_{ii} = variance = $\sum_{t=1}^{N} \frac{(R_{i_t} - \bar{R}_i)^2}{N-1}$ =

the sum of squared deviations of actual returns from mean returns for agency i over time t = 1 to N, divided by the number of time periods minus 1. There are A variance terms because there are A agencies.

σ_{ij} = covariance = $\sum_{t=1}^{N} \frac{(R_{i_t} - \bar{R}_i) \times (R_{j_t} - \bar{R}_j)}{N-1}$ =

the sum of the cross products of agency i's and agency j's deviations in returns from their respective means over time t = 1 to N, divided by the number of time periods minus 1. There are A x (A-1) covariance terms.

This formula was applied to the data on direct subsidies presented in table 4 of the report. The results are presented in tables I-1, I-2, and I-3 of this appendix. Table II-7 of Appendix II presents the ratios of agency outstanding loans to total outstanding loans for each of fiscal years 1965 through 1975. Table I-1 of this appendix presents the matrix of the cross products of these proportions for fiscal year 1975 ($x_i \cdot x_j$). Table I-2 presents the variance-covariance matrix calculated from the direct subsidy data. The diagonal elements of the matrix are the raw agency variances in returns (σ_{ii}) and the off-diagonal elements are the covariance terms (σ_{ij}). Table I-3 presents a matrix of the element by element contribution of each agency's programs to total portfolio variance ($x_i . x_j . \sigma_{ij}$). The sum of the diagonal elements plus two times the sum of the off-diagonal elements is the estimate of total portfolio variance for Federal credit programs for fiscal year 1975. We estimate this variance to be 40 basis points for fiscal year 1975 (0.40 percentage point).

APPENDIX I

Table I-1

Portfolio Proportions Matrix
Federal Credit Programs: 1975

	President	Agriculture	Commerce	Defense	Interior	Veterans Admin.	Health, Education, and Welfare	Housing and Urban Development	Ex.-Im. Bank	SBA
	(percent)									
President	.0034	.0077	.0009	.0000	.0000	.0088	.0020	.0298	.0040	.0021
Agriculture		.0171	.0021	.0000	.0000	.0196	.0044	.0664	.0089	.0047
Commerce			.0002	.0000	.0000	.0024	.0005	.0080	.0011	.0006
Defense				.0000	.0000	.0000	.0000	.0000	.0000	.0000
Interior					.0000	.0000	.0000	.0001	.0000	.0000
Veterans Administration						.0224	.0051	.0759	.0102	.0053
Health, Education, and Welfare							.0011	.0172	.0023	.0012
Housing and Urban Development								.2573	.0345	.0181
Ex-Im Bank									.0046	.0024
SBA										.0013

Table I-2

Variance-Covariance Matrix of Returns
Federal Credit Programs: 1965-1975

	President	Agriculture	Commerce	Defense	Interior	Veterans Admin.	Health, Education, and Welfare	Housing and Urban Development	Ex.-Im. Bank	SBA
	(percent)									
President	1.243	.659	.393	.459	-1.065	-.004	.734	.277	.382	1.955
Agriculture		2.395	.796	3.732	.049	.042	2.482	.544	.537	3.536
Commerce			.461	1.220	-.357	-.008	.764	.129	.175	1.305
Defense				20.283	-.552	.033	5.693	.634	.862	4.174
Interior					7.859	.068	-.770	.499	.413	.378
Veterans Administration						.007	.012	.020	.001	.093
Health, Education, and Welfare							3.586	.559	.644	3.034
Housing and Urban Development								.221	.214	1.046
Ex-Im Bank									.278	1.019
SBA										7.360

Table I-3

Agency by Agency Contribution to Portfolio Variance
Federal Credit Programs: Fiscal Year 1975
Basis Points

	President	Agriculture	Commerce	Defense	Interior	Veterans Admin.	Health, Educ. and Wel.	Housing and Urban Development	Ex.-Im. Bank	SBA	Total
	(percent)										
President	.43	.51	.04	.00	.00	.00	.15	.82	.15	.41	2.51
Agriculture		4.10	.16	.00	.00	.08	1.10	3.61	.48	1.65	11.18
Commerce			.01	.00	.00	.00	.04	.10	.02	.07	.44
Defense				.00	.00	.00	.00	.00	.00	.00	.00
Interior					.00	.00	.00	.00	.00	.00	.00
Veterans Administration						.02	.01	.15	.00	.05	.31
Health, Education, and Welfare							.41	.96	.15	.37	3.19
Housing and Urban Development								5.68	.74	1.89	13.95
Ex-Im Bank									.13	.25	1.92
SBA										.93	5.62
Total											39.63

This is not an appropriate measure of dispersion to use in attempting to estimate private lender risk premiums. From society's viewpoint, it may be correct to assume that a measure of dispersion for the aggregate of Federal credit programs is an appropriate measure of risk. In the aggregate, returns to the total of these operations tend to vary little from year to year and such variation is spread over all taxpayers. But private lenders do not establish the level of compensation required to make them indifferent to risk in the same way that the Government or society would be expected to. There is no single monolithic counterpart in the private sector which is so well diversified, or which has so many "stockholders," that its risk exposure is comparable to the Government's or society's risk exposure. If the Government were risk-averse, it might be appropriate for it to require an average risk premium consistent with the risk for its entire portfolio; but private lenders do not do business at the scale of operations, or on so widely diversified a basis as the Federal Government, and therefore in the absence of Federal credit assistance would require higher risk premiums if they were making these loans.

The contribution of each agency's activities to total Federal portfolio variance is measured by the following formula:

$$(2) \quad \sigma^2 (R_a)_p = x_a{}^2 \cdot \sigma^2(R_a) + \sum_{\substack{j=1 \\ j \neq a}}^{A} x_a \cdot x_j \cdot \sigma_{aj}$$

Where: R denotes returns and variance for the agency in question, and the subscript "p" denotes that agency contributions to variance are estimated in the context of a portfolio of other financial assets. All other notation is as described in equation 1.

Our estimates of the contribution that each agency makes to total portfolio variance for fiscal year 1975 may be read off the right-hand side column of table I-3.

The contribution to overall portfolio variance of each agency's programs has relevance only within the context of management of the Federal credit program portfolio. It has little relevance for decisions regarding risk premiums that would be required by private lenders since those lenders do not hold the Government's portfolio. If the variance in returns to an agency has relevance at all to a private

lender's decisions regarding risk, it would be evaluated in its raw form ($\sigma^2(R_a)$) as it contributes to private lender portfolio variance rather than in relation to a portfolio of financial assets which private lenders are not likely to hold.

We decided not to use the raw agency variance in returns as a measure of risk because it was also too highly aggregated across loans that may have widely differing characteristics. However, we were not able to precisely calculate variances at any lower level of aggregation than the agency level because of the poor quality of program data on profits and losses.

To estimate program variance it was necessary to make the following simplifying assumptions:

1. Each agency's outstanding loans are equally distributed among each of its programs. This assumption is not correct, but is not crucial.

2. There is an analogue between the covariance in returns among an agency's programs relative to raw agency variance and the covariance in returns among agencies relative to overall Federal credit program portfolio variance. Just as the return to the total Federal portfolio is composed of returns to individual agencies, an agency aggregate return is composed of returns from its portfolio of individual programs.

With equal distribution of outstanding loans among an agency's programs, agency variance (which we have estimated) is equal to:

$$(3) \quad \sigma^2(R_a) = \frac{1}{p^2} \cdot \sum_{i=1}^{P} \sigma_{ii} + \frac{1}{p^2} \cdot \sum_{i=1}^{P} \sum_{\substack{j=1 \\ j \neq i}}^{P} \sigma_{ij}$$

Where: there are P programs managed by an agency (a) and the variance-covariance terms on the right-hand side of the equation refer to the agency's programs.

With rearrangement of terms, agency variance in returns is equal to:

$$(4) \quad \sigma^2(R_a) = \frac{1}{p} \cdot \bar{\sigma}_{ii} + \frac{P-1}{p} \cdot \bar{\sigma}_{ij}$$

Where: $\bar{\sigma}_{ii}$ = the mean value of each program's variance in returns.

$\bar{\sigma}_{ij}$ = the mean value of the covariance of each program's returns with each other program's returns within the agency.

We are interested in estimating average individual program variance ($\bar{\sigma}_{ii}$ in equation 4). In order to get this, information is required for P--the number of programs managed by each Agency $\sigma^2(R_a)$ --the raw agency variance; and the mean value of the covariance terms for each agency ($\bar{\sigma}_{ij}$). Everything except $\bar{\sigma}_{ii}$ and $\bar{\sigma}_{ij}$ is known. If $\bar{\sigma}_{ij}$ is known, $\bar{\sigma}_{ii}$ can be solved.

Mean values of program-by-program covariances for each agency were estimated by assuming that the relationship between the mean value of program-by-program covariances and mean program variances could be analogized to the relationship between the mean value of agency-by-agency covariances and mean agency variances at the aggregate Federal credit program portfolio level. Using table I-2 of this appendix, portfolio variance is calculated as the sum of the mean value of the agency variances and agency covariances weighted by the terms given in equation 4, with equal proportions assumed. Our results are:

$$1.174 = 4.370 \times (1/10) + .819 \times (9/10)$$

Where: 1.174 percentage points is our estimate of portfolio variance for all Federal credit programs if an equal amount of dollars were allocated to each of the 10 agencies included in the analysis.

The terms on the right-hand side of the relationship are the mean values of the 10 agency variances and 90 agency covariances, weighted according to equation 4. The estimate of overall portfolio variance is higher than our earlier estimate because we are assuming equal weighting.

The mean value of the covariance term is only 18.7 percent of the mean value of the variance term. But, because of the number of covariance terms, agency covariance has a greater effect on total portfolio variance than does agency variance. Covariance terms enter with nine times more weight than variance in estimating total portfolio variance.

We analogized the above result to the program level, but it is conjectural. The raw variance term at the agency level in table I-2 reflects the influence of the covariance among programs as well as individual program variances. We need to adjust the raw agency variance term to isolate the effect of program variance. Since we do not know the mean value of $\overline{\sigma_{ij}}$, in equation 4, we might assume that it is about 18 percent of the program variance term $(\overline{\sigma_{ii}})$, based on the results which we obtained above. But because programs administered by an agency are likely to be more similar in nature than are programs administered by different agencies, we expect that the mean value of the covariance term would be larger in relation to program variance.

A conservative estimate of the magnitude of the mean value of the covariance term in equation 4 is that it is approximately 40 percent of individual program variance. With the assumption of equal distribution of an agency's outstanding loans among its programs and with a mean program covariance which is approximately 40 percent of mean program variance, we have:

$$(5) \quad \sigma^2(R_a) = (1/P)\cdot\overline{\sigma_{ii}} + ((P-1)/P)\cdot \overline{\sigma_{ii}} \cdot .40$$

We know $\sigma^2(R)$ from the diagonal elements in table I-2 of this appendix. These data and the number of programs within each agency are as follows:

Table I-4

Agency	Number of programs	Agency variance (percent)
President	8	1.24
Agriculture	21	2.40
Commerce	7	0.46
Defense	1	20.28
Interior	1	7.86
Veterans Administration	5	0.01
Health, Education, and Welfare	8	3.59
Housing and Urban Development	45	0.22
Export-Import Bank	5	0.28
SBA	15	7.36

Source: "Catalogue of Federal Loan Guarantee Programs," Subcommittee on Economic Stabilization; Committee on Banking, Finance and Urban Affairs; House of Representatives; 95th Congress: 1st Session; U.S. Government Printing Office; Department of Treasury, various years.

We solved for $\overline{\sigma}_{ii}$ in equation 5 for each agency via the following formula:

$$(6)\quad \overline{\sigma_{ii}} = \frac{P \cdot \sigma^2(R_a)}{(1 + ((P-1)x\ .40)}$$

The results presented in table I-5 are for the mean level of individual program variance for each agency.

Table I-5

Agency	Estimated mean level of program variance (percent)
President	2.36
Agriculture	5.36
Commerce	0.85
Defense	20.28
Interior	7.86
Veterans Administration	0.02
Health, Education, and Welfare	6.84
Housing and Urban Development	0.52
Export-Import Bank	0.47
SBA	15.77

We cannot analyze agency variance any further than this. Ideally, we would have measures of variance for each class of loans for each program. But, if we assume (1) that loans made under a particular Federal credit program are similar in nature and (2) that individual lenders would make a sufficient number of loans of this type for purposes of actuarily estimating expected returns, then a measure of dispersion for the "typical" program administered by various agencies in a reasonable approximation to the dispersion measured risks which would be faced by private lending institutions. If there are any biases in these estimates, it is not possible to determine their net effect on the estimates. For example, if loans made under a particular program are not similar, the variance estimates probably understate the true risk of the loans. On the other hand, since private lenders are also diversified, risks on individual loans may be evaluated in the context of their total portfolio, and the risk premium required on an individual loan may be lower than implied by its variance. The risk premium would be based mainly on what is known as nondiversifiable risk which

incorporates the behavior of private lenders making noncredit assistance loans to program beneficiaries into the analysis. 1/

The estimates presented above are used in the main body of the report to estimate risk premiums.

The market's response to risk

The way that the market has historically responded to risk was estimated from a least squares regression of various security yields on their variances. The summary data which we used are presented in table I-6. Data base construction is as follows.

Table I-6

Mean Annual Returns and Standard Deviations of Returns for Selected Securities (1942 through 1971)

Security type	Mean annual return	Standard deviation
Risk Free Bonds	3.18	0
Moody's AAA Industrial	3.73	3.90
Moody's AA industrial	3.84	3.79
Moody's AAA Corporate	3.85	3.90
Moody's AA Corporates	3.97	3.82
Moody's A Industrials	3.96	4.02
Moody's A Corporates	4.15	4.00
Moody's BAA Industrials	4.40	4.32
Moody's BAA Corporates	4.58	4.50
S&P Composite Index	13.45	13.47
S&P Industrial Index	13.85	13.66

We obtained annual observations on yields to maturity for Moody's AAA through BAA Corporate and Industrial Bonds for the period 1941 through 1971 from the 1976 Moody's Industrial Manual. Annual rates of return to the Standard and Poor's 500 composite and industrial indexes were calculated

1/In the next section, the risk premiums estimated to have been required based on variance in returns are implicitly assumed to take portfolio considerations into account. What has not been taken into account is the covariance of typical program returns with returns on other assets in lender's portfolios.

from index values and dividend yield data obtained from the Economic Report of the President for the same period. Measures of the risk free rate of return were obtained from Friend and Blume. 1/ Friend and Blume obtained their measure of the risk-free rate of return from Sidney Homer, updated by Solomon Brothers for the years 1963 through 1971. 2/

Our approach to estimating average annual returns and standard deviations of returns for bonds and stocks was as follows.

Moody's bonds: Mean annual desired returns and their standard deviations were estimated from yields on Moody's AAA through BAA Corporate and industrial bonds.

For purposes of estimating dispersion, annual actual returns to each of the eight classes of corporate and industrial bonds were estimated on the basis of the following assumptions regarding yields and their relation to prices, maturities, and selling behavior.

1. A 20-year bond is bought in year t-1 at par (100) with a coupon rate of interest equal to yields in year t-1.

2. At the end of the year, the bond is sold to yield a return equal to yields then prevailing in the market.

3. We assume that when a bond is sold it is held by the purchaser for the remaining 19 years to maturity.

4. The annual rate of return to the original purchaser is the sum of the capital gain or loss when the bond is sold and the interest earnings based on the coupon rate of interest.

The formula used was:

$$R_t = ((P_t - 100.0) + (Y_{t-1} * 100.0))/100.0$$

Where R_t = the annual rate of return to the original investor.

1/Friend, Irwin & Blume, Marshall E., "The Demand for Risky Assets," American Economic Review, Vol. 65, December 1975.

2/Sidney Homer, The History of U.S. Interest Rates.

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Y_{t-1} = the assumed coupon rate of interest on the bond when it was purchased in the previous year at par (100).

P_t = the value at which the bond would be sold in year t in view of yields in year t. It is calculated according to the following formula:

$$P_t = \left[100.0 * \frac{1}{(1+Y_t)^n}\right] + \left\{((Y_{t-1})*100.0) * \left[1 - \frac{\frac{1}{(1+Y_t)^n}}{Y_t}\right]\right\}$$

where: Y_t is the yield on the bond when it is sold in year t and n is the number of years remaining to maturity.

Our measure of desired returns on Moody's bonds is defined as the coupon rate (yield at time t-1) on a bond purchased at time t-1. Our rationale for this measure is that the coupon on a bond sold at par at time t-1 is set to clear the market in view of the demand and supply forces then existing in the market. The coupon reflects the market's desired rate of return given its expectations of (and uncertainty about) future actual returns. The actual one period rate of return may differ significantly from the desired rate of return because of price fluctuations resulting either from factors peculiar to a particular class of securities or from market factors.

Standard and Poors Stock Market Indexes: The annual rate of return on the common stock indexes is the sum of the capital gain or loss plus dividend payments during the period divided by the value of the index at the beginning of the period.

The formula used for calculating returns was:

$$r_t = ((P_t + (D_t/P_t * P_t) - P_{t-1})/P_{t-1}$$

where: r_t = the return on the index in year t.

P_{t-1} = the value of the index at the beginning of the period.

P_t = the value of the index at the end of the period.

D_t = the dollar value of dividends received during the period and D_t / P_t is the dividend yield.

Mean values and variances in rates of return were calculated for the 1941 to 1971 period.

Risk-free rate of return: The risk-free rate of return was defined by Friend and Blume as the yield on Prime Corporate Bonds with 1 year to maturity. Since High Grade Corporate Bonds with 1 year to maturity purchased at the beginning of the year will be redeemed at par at the end of the year, there is no risk of divergence of actual from desired returns due to price fluctuations, unless, of course, the borrower defaults during the year. The use of High Grade Corporates in the definition minimizes this possibility.

The data presented in table I-6 were fitted via ordinary least squares with the following results.

The relationship between mean annual desired returns and the variances in returns is well fitted. Ninety-nine percent of the variation in mean annual returns is "explained" by the dispersion in returns. In addition, the standard error of estimate (S_e) is less than 10 percent of the mean value of the returns data. Both the intercept and slope parameter estimates are statistically significant at the 99 percent level.

The inferential power of this estimate depends to some extent on its stability during the period. If there have been substantial changes in the relationship between 1942 and 1971, then the predictive power of the estimating equation might be diluted depending on the nature of the instability. To examine the stability of the 1942 to 1971 estimate, similar relationships were estimated over three subperiods: 1942-1951, 1952-1961, and 1962-1971. The results are presented in the following table.

Table I-7

Changes in the Relationship Between Risk and Return
(1942 through 1971)

Period	Intercept	Slope		
(1942-51)	2.452	.0571		
	(13.26)	(30.30)	Se = .543	$\bar{R}^2$ = .9903
(1952-61)	2.699	.0740		
	(14.82)	(34.71)	Se = .500	$\bar{R}^2$ = .9926
(1962-71)	4.779	.0285		
	(37.71)	(12.60)	Se = .265	$\bar{R}^2$ = .9463

The results suggest that though private capital markets are risk-averse (all slope coefficients are significantly positive at the 99 percent level), there has been less of a reluctance toward volatility in recent years than in the past. The risk premium required by private lenders is lower in the most recent period than in either of the two earlier subperiods.

We used the fitted relationship between risk and return for the 1942 through 1971 period as the measure of the market's response to risk. The slope coefficient was multiplied by the estimated variances in returns for Federal credit programs shown in table I-5 to calculate risk premiums for Federal credit programs. The intercept was not included in the calculations because it may be interpreted as an estimate of the risk-free rate of return. The risk-free rate is assumed to be included in the rate of interest that private lenders would require in the absence of risk. It, therefore, is already included in our calculations for differences between actual rates charged and commercial rates arising because of the Government losses and the borrowing differential.

This estimate is not precise and, if anything, may be low because we have not taken account of the lower marketability of Federal credit assistance debt instruments relative to the highly marketable instruments whose yields and variances were used to fit the historical risk-return relationship.

DATA SOURCES AND DATA ADJUSTMENTS

I. THE DIRECT SUBSIDY

Outstanding direct and guaranteed loans

Sources: 1962-1972--"Federal Credit Programs of the United States Government;" produced annually by the U.S. Department of Treasury, Fiscal Service, Bureau of Accounts, Division of Central Accounts and Reports.

1973-1975--Treasury Bulletin: "Federal Credit Programs--Direct and Guaranteed Loans Outstanding," Table GA-II-2, U.S. Department of Treasury.

Loans outstanding within each agency, and by specific programs, are presented in tables II-4 and II-1.

Some data modifications, such as adjustments or exclusions, were necessitated by deficiencies in the available data. For a complete explanation of all modifications made, see the footnotes to table II-1. Various liquidating programs were excluded from this study, because they are not ongoing and little can be learned about the costs of these programs from available data. 1/ The Commodity Credit Corporation (Department of Agriculture) was excluded because it is more appropriately classified as an expenditure than a credit program.

Adjustments to outstanding loans data were necessary when outstanding loan data could not be matched with appropriate profitability data. These shortcomings were resolved in the following manner:

1/These include: Development Loan Liquidation Account, Agency for International Development and Liquidation of Foreign Military Sales Fund (President); Liquidation of Hoonah Housing Project (Department of the Interior); and Liquidating Programs Account (Department of Housing and Urban Development). Other agencies or programs excluded for lack of available data were the Emergency Loan Guarantee Board and the General Services Administration.

1. If profit and loss data were reported for a particular year for a particular program, no outstanding loan data existed for that year, and the aggregate agency trend of growth of outstanding loans was roughly linear, outstanding loans for the program were not estimated. Data on profits and losses were included and it was assumed that the program's outstanding loans for the year in question was reported as part of another program or fund. This problem generally occurred when profits and losses were reported for an overhead account which had no outstanding loans allocated to it.

2. If outstanding loans for a program were not reported for a particular year, profit and loss data were available and there was not a reasonable basis for assuming that outstanding loans were reported under another program, then an outstanding loan figure for the program was estimated through interpolation if data on outstanding loans existed for prior and subsequent years and provided that there was a distinct trend in the program's outstanding loans.

Referring to tables II-1 and II-2, it is noted that in many cases, program-by-program information on outstanding loans and losses does not exist for a sufficient number of years for purposes of calculating reliable averages and variances of returns. It is principally for this reason that data had to be aggregated at the agency level and variances calculated at that level of aggregation.

II. PROFITS AND LOSSES OF FEDERAL CREDIT PROGRAMS

Source: 1965-1975--Treasury Bulletin: Statements of Income and Retained Earnings, Government Corporations and other Business-Type Activities," U.S. Department of Treasury.

During the first year of operation of certain Federal credit programs, profit and loss data were not available. In these cases, a break-even level of operations was assumed. Aside from these circumstances, lack of annual profit and loss data required that the program be excluded from the analysis for the entire period 1965 through 1975. Table II-2 presents profit and loss data on a program-by-program basis, along with explanations of all adjustments made. In table II-5, these data are shown on an agency-by-agency basis.

III. APPROPRIATIONS FOR FEDERAL CREDIT PROGRAMS

Source: 1965-1975--"Appendix, The Budget of the United States Government," Executive office of the President, Office of Management and Budget, Fiscal years 1967 through 1977.

Appropriations data were gathered after the programs to be included in the analysis had been decided on, based on availability of profitability and outstanding loans data. No adjustment of appropriations data was necessary, and all data used were actual figures rather than estimates. Appropriations data are shown in tables II-3 and II-6.

The data adjustments probably reduce the reliability of the data base which was finally used. This, in turn, affects the estimates of the direct subsidy and risk premium for Federal credit programs. Nevertheless, we feel these data sources are the most complete and most detailed, while at the same time being reasonably accessable and manageable. Another problem with the data base on profits and losses which we use to estimate subsidies is that distinctions between profits and losses and appropriations for the various Federal credit agencies are not usually made for the two major types of credit assistance. We have no basis for allocating these profits and losses and appropriations data between direct and guaranteed loan programs, and it is not possible to estimate the direct subsidy for each type of credit assistance on an agency-by-agency basis. However, because of compositional differences which exist between outstanding direct and guaranteed loans among agencies, the total direct subsidy element on direct and guaranteed loans can be roughly estimated. With the assumption that the direct subsidy did not differ significantly between these two types of programs within agencies, we estimated all of the elements of the subsidy for each type of credit assistance.

IV. 3-MONTH TREASURY BILL RATE

Source: 1965-1975--"Economic Report of the President," U.S. Government Printing OFfice, Washington, D.C., 1976.

V. 3-TO-5-YEAR ISSUES OF U.S. GOVERNMENT SECURITIES YIELDS

Source: 1965-1975--Same as 3-month Treasury Bill rate.

THE BORROWING DIFFERENTIAL

I. AAA CORPORATE BOND YIELD

Source: 1/1947 - 12/1975--Data Resources, Incorporated, Central Data Base.

II. 4-TO-6-MONTH PRIME COMMERCIAL PAPER RATE

Source: Same as AAA Corporate Bond Yield.

III. 3-MONTH TREASURY BILL RATE

Source: Same as AAA Corporate Bond Yield.

IV. LONG-TERM GOVERNMENT BOND YIELD

Source: Same as AAA Corporate Bond Yield.

THE RISK PREMIUM

I. MOODY'S AAA THROUGH BAA CORPORATE AND INDUSTRIAL BOND YIELDS

Source: 1941-1971--Moody's Industrial Manual, 1976; Vol. 1, Moody's Investor Service, Inc., pages A-36 through A-40.

II. STANDARD AND POORS 500 COMPOSITE AND INDUSTRIAL INDEX

Source: 1941-1971--"Economic Report of the President:" U.S. Government Printing Office, Washington, D.C., 1968 and 1975.

III. MEAN VALUES OF THE RISK-FREE RATE OF RETURN

Source: 1941-1971--Friend, Irwin and Blume, Marshall, "The Demand for Risky Assets," The American Economic Review, December 1975, Vol. 65.

APPENDIX II

Table II-1

Outstanding Direct and Guaranteed Loans

of Selected Federal Credit Programs: 1965-1975

	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
President											
Agency for International Development:											
Alliance for Progress	503,170	800,184	1,216,721	1,540,273	1,856,088	2,153,776	2,397,622	2,577,962	2,782,373	2,995,482	3,183,381
Development Loans	1,633,148	2,273,380	2,932,582	3,567,841	4,150,770	4,699,511	5,306,186	5,733,914	6,048,723	6,346,197	6,646,310
Foreign Inv. Guarantee Fund	-	138,000	187,800	276,522	183,197	-	-	-	-	-	-
Common Defense, Econ. & Triangle	-	-	-	a/63,000	63,682	61,839	59,942	57,744	55,343	54,067	55,843
Housing Inv. Guarantee	-	-	-	-	-	184,315	177,582	236,849	-	-	-
Econ. Opportunity Loan	17,018	45,623	70,013	86,818	84,720	75,121	65,144	52,634	42,097	-	-
Foreign Military Sales	-	79,991	73,930	b/45,715	17,500	121,652	227,822	425,282	-	1,137,300	1,147,962
Appalachian Housing	-	-	-	11	381	985	1,008	1,234	1,469	1,332	1,005
Overseas Private Inv.	-	-	-	-	-	-	112,670	156,900	57,342	189,988	186,440
Agriculture											
Farmers Home Administration:											
Direct Loan Acct.	1,109,539	1,126,598	1,169,835	1,254,566	1,302,177	1,354,216	1,375,102	1,402,216	-	-	-
Emergency Credit Rev. Fund	104,701	120,448	124,336	139,603	148,759	128,176	146,429	63,171	-	-	-
Agric. Credit Insurance	835,426	1,083,707	1,354,280	1,645,456	1,946,172	2,227,533	2,452,462	2,889,270	3,769,325	4,024,530	5,346,689
Rural Housing Direct Loans	681,469	684,810	655,409	621,428	587,097	-	-	-	-	-	-
Self-Help Housing	-	-	-	-	-	114	241	267	193	148	450
Rural Development Insurance	-	-	-	-	-	-	-	-	1,094,683	1,341,907	1,823,397
Rural Housing Insurance	-	154,469	535,213	1,024,821	1,464,240	2,724,304	3,821,727	5,213,433	6,527,638	7,575,928	9,482,729
Econ. Opportunity Loan Fund	-	-	-	-	-	-	-	-	-	33,581	-
Rural Electrification	4,072,259	4,274,404	4,505,792	4,796,259	5,026,156	5,342,930	5,795,397	6,160,458	6,612,158	7,339,901	8,374,935
Commerce											
Maritime Administration	518,984	561,229	580,429	602,233	624,474	703,738	949,963	1,138,079	1,311,377	1,709,217	2,403,843
Econ. Dev. Admin. - Rev. Fund	126,051	165,434	200,872	251,856	307,935	355,815	403,215	457,957	509,638	522,396	585,073
National Oceanic and Atmospheric Administration											
Fisheries Loan Fund (note c)	5,981	5,984	7,338	8,248	9,161	9,930	9,499	9,152	7,509	4,946	3,563
Fed. Ship Financing (note d)	2,476	3,749	10,396	10,720	16,361	18,704	18,724	16,582	11,778	9,965	11,058
Defense											
Defense Prod. Guarantees	43,471	38,951	47,403	30,745	16,316	11,004	11,004	5,136	5,920	5,013	3,732
Health, Education, and Welfare											
Higher Education Facilities Loan Fund	-	-	129,773	235,469	326,660	424,207	472,541	480,748	478,748	473,936	470,630
Student Loan Insurance	540,919	736,976	881,016	66,544	701,372	1,597,928	2,192,561	3,269,611	4,101,846	4,795,654	5,132,763
Nurse Training Fund	-	-	-	6,577	11,582	15,505	15,116	29,98	13,616	12,081	11,295

APPENDIX II

Table II-1 (continued)

	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
Health Professions Educ. Fund	-	-	-	11,541	23,728	30,190	30,159	14,305	29,521	28,669	27,208
Med. Fac. Loan & Guarantees	-	-	-	-	-	-	-	-	51,864	480,355	836,459
Health Maintenance Organization Loan Guarantees	-	-	-	-	-	-	-	-	-	-	2,000
Interior											
Re. Fund for Loans	e/25,000	f/25,000	25,656	25,178	25,228	25,737	27,663	27,843	28,039	28,568	36,497
General Services Administration											
Def. Prod. Guarantees (note g)	-	-	-	34,125	7,910	4,875	4,875	4,875	4,875	-	-
SBA											
Direct Loans	1,144,956	1,195,263	1,248,442	-	1,348,047	1,374,474	1,303,586	1,047,594	811,927	773,701	702,330
Guaranteed Loans	16,594,400	16,301,200	16,326,200	17,482,623	18,238,559	18,960,786	19,704,000	21,845,516	24,420,000	25,767,000	27,925,000
Educ. Loan Fund	-	-	-	-	-	-	-	-	-	-	1,458
Housing and Urban Development											
New Communities	-	-	-	-	-	-	56,500	124,000	198,000	252,500	273,500
Public Facility Loans	183,776	212,681	268,595	314,020	357,997	396,975	433,829	451,767	462,065	477,446	-
Community Disposal	3,643	7,273	10,873	10,779	11,666	10,803	9,233	7,971	5,531	4,735	4,126
Housing-Elderly/ Handicapped	94,927	147,457	224,927	306,181	385,536	467,373	515,475	523,140	523,310	519,825	513,614
Federal National Mortgage Association											
Special Assistance	1,116,638	1,420,852	1,525,816	1,970,615	-	-	-	-	-	-	-
Management/Liquidation	1,019,175	1,028,683	1,426,789	1,723,526	-	-	-	-	-	-	-
Secondary Mkt. Operations	-	-	4,450,683	6,388,498	-	-	-	-	-	-	-
Government											
Special Assistance	-	-	-	-	2,412,914	3,083,727	3,443,511	3,773,261	3,311,363	3,097,098	4,729,868
Management/Liquidation	-	-	-	-	1,842,914	1,763,554	1,647,019	1,282,873	449,590	384,883	334,108
Federal Housing Administration	48,624,519	52,731,214	54,832,550	58,451,012	62,773,542	68,235,758	78,008,423	86,028,654	88,217,948	87,456,492	87,751,915
Rehabilitation Loan Fund	-	468	5,776	21,089	46,428	82,933	125,941	167,448	197,877	206,762	239,558
College Housing	1,926,461	2,244,430	2,881,753	3,030,337	3,169,348	3,242,494	3,242,494	3,262,378	3,266,378	3,230,330	3,171,907

APPENDIX II

Table II-1 (continued)

	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
Ex-Im Bank											
Regular lending	4,873,436	5,134,675	4,863,585	5,806,346	6,553,481	6,835,226	7,125,085	7,971,728	9,249,800	11,189,274	13,020,381
SBA											
Business loans	785,194	857,989	1,383,615	1,542,112	1,673,622	1,930,793	2,196,792	3,076,490	4,077,926	5,008,498	5,446,075
Disaster loans	140,225	292,846	287,152	350,916	345,931	400,872	563,123	632,601	1,277,010	1,346,290	1,365,616
Emergency Loan Guarantee (note h)	-	-	-	-	-	-	-	100,000	150,000	220,000	195,000

a/This is an estimate, calculated at 98.92 percent of FY 69 amount. Actual data unavailable.

b/This is an estimate, an average of amounts for FY 67 and FY 69. Actual data unavailable.

c/Fisheries Loan Fund under the Department of Interior, FY 65 - FY 71.

d/Federal Ship Financing under the Department of Interior, FY 65 - FY 71.

e/An estimate, calculated at 97.4 percent of FY 67 amount. Actual data unavailable.

f/An estimate, calculated at 97.4 percent of FY 67 amount. Actual data unavailable.

g/Excluded from study.

h/Excluded from study.

APPENDIX II

Table II-2

Profit (Loss) of Selected Credit Programs: 1965-1975

	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
President											
Agency for International Development:											
Alliance for Progress	4,169	6,319	11,139	12,718	11,502	11,231	-10,968	2,566	24,568	32,145	40,421
Development Loans	10,430	17,716	24,611	32,379	39,539	48,489	42,105	38,449	50,993	63,012	79,692
Foreign Inv. Guarantee Fund	7,857	10,180	5,172	11,466	16,379	8,458	-	-	-	-	-
Common Defense, Econ. & Triangle	-	-	-	-	76,532	100,206	5,829	-111,452	188,181	-130,232	25,805
Housing Inv. Guarantee	-	-	-	-	-	-	13,778	432	-	-	-
Econ. Opportunity Loan	-1,719	-3,115	-3,132	-2,710	-1,390	-29,345	-2,239	-1,712	-5,857	-118	98
Foreign Military Sales	-	1,025	530	1,426	-	-	-	-	-	40,472	46,146
Appalachian Housing	-	-	-	-21	-9	-14	-17	-227	-169	-242	-554
Overseas Private Inv.	-	-	-	-	-	-	13,111	28,258	31,372	37,096	43,407
Agriculture											
Farmers Home Administration:											
Direct Loan Acct.	19,567	21,387	17,281	7,277	7,086	77,894	19,936	18,157	-	-	-
Emergency Credit Rev. Fund	-4,978	-5,005	-5,518	-6,304	-9,772	-8,788	-24,901	-8,001	-	-	-
Agric. Credit Insurance	4,240	5,199	-100	-4,790	-54,965	-49,801	-61,589	-85,613	-550,731	-244,829	-268,465
Rural Housing Direct Loans	-	3,535	4,041	610	846	-	-	-	-	-	-
Self-Help Housing	-	-	-	-	-	-	5	7	-389	-502	-676
Rural Development Insurance	-	-	-	-	-	-	-	-	-14,258	-42,171	-71,731
Rural Housing Insurance	-	911	493	-2,152	-15,123	-36,000	-59,814	-98,430	-399,402	-281,563	-393,524
Econ. Opportunity Loan Fund	-	-	-	-	-	-	-	-	-	-4,265	-
Rural Electrification	-10,368	-11,514	-10,460	-10,400	-11,344	-12,845	-13,293	-13,760	109,044	144,493	173,239
Commerce											
Maritime Administration	3,432	2,904	1,518	4,578	498	5,256	5,213	7,804	7,133	10,208	11,010
Econ. Dev. Admin. - Rev. Fund	-	3,909	-661	629	3,445	-4,903	-2,140	-15,915	-24,785	-12,325	-4,666
National Oceanic and Atmospheric Administration											
Fisheries Loan Fund (note a)	-32	-10	-551	-564	-398	-452	-614	-776	-954	-259	-162
Fed. Ship Financing (note b)	59	43	97	70	194	144	198	289	-186	157	244
Area Redevelopment Administration	451	-	-	-	-	-	-	-	-	-	-
Defense											
Defense Prod. Guarantees	244	585	1,046	-1,922	-940	-95	228	-395	-286	50	-212
Health, Education, and Welfare											
Higher Education Facilities Loan Fund			1,482	-685	-2,351	-20,445	-15,601	-13,650	-13,367	-16,582	-19,071
Student Loan Insurance	(c)	(c)	(c)	450	-17	-2,268	-7,525	-13,809	-239,054	-127,778	-193,815
Nurse Training Fund				159	180	245	-44	204	215	-404	61

APPENDIX II

Table II-2 (continued)

	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
Health Professions Educ. Fund	-	-	-	87	-276	126	-366	-130	-61	-148	-543
Med. Fac. Loan & Guarantees	-	-	-	-	-	-	-	-	-	-1,856	-8,722
Health Maintenance Organization Loan Guarantees	-	-	-	-	-	-	-	-	-	-	57
Interior											
Rev. Fund for Loans	-721	597	241	1,256	552	643	568	405	929	923	798
General Services Administration											
Def. Prod. Guarantees (note d)	-	-	-	2	15	39	27	28	28	29	29
Veterans Administration											
Direct Loans	15,642	9,444	10,539	10,902	13,340	18,594	22,039	11,771	4,842	11,989	15,723
Guaranteed Loans	-29,772	-25,075	-8,897	-3,482	1,201	16,481	78	-8,910	-21,529	-31,889	-21,369
Educ. Loan Fund	-	-	-	-	-	-	-	-	-	-	-
Housing and Urban Development											
Public Facility Loans	-1,710	-1,365	-2,317	-4,138	-5,099	-4,833	2,261	2,839	3,802	3,641	24
Community Disposal	-259	-2,074	-1,087	622	-1,882	469	-5,138	-3,869	-3,208	-3,366	e/-2,411
Housing-Elderly/ Handicapped	1,101	2,624	4,388	4,394	3,234	6,081	352	546	408	320	262
Federal National Mortgage Association							7,959	9,715	10,303	10,322	9,621
Special Assistance	4,152	10,869	8,883	4,785	-	-	-	-	-	-	-
Management/Liquidation	2,488	3,344	7,563	8,201	-	-	-	-	-	-	-
Secondary Mkt. Operations	11,961	14,874	10,191	17,971	-	-	-	-	-	-	-
Government											
Special Assistance	-	-	-	-	-10,187	-30,811	-60,249	-125,267	-192,962	-305,497	-313,351
Management/Liquidation	-	-	-	-	9,800	13,618	3,798	5,179	-56,886	2,803	4,257
Federal Housing Administration	23,290	10,440	52,801	88,102	143,548	182,191	138,202	-57,308	-287,638	-572,478	-753,492
Rehabilitation Loan Fund	-180	-1,413	-1,922	-1,239	-2,037	-2,382	-2,238	-827	854	3,188	891
College Housing	2,375	2,792	649	-23,084	-55,237	-51,889	-34,116	-11,807	-1,842	-803	-1,547
New Communities	-	-	-	-	-	-	-	-	-	-	-

APPENDIX II

Table II-2 (continued)

	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
Ex-Im Bank											
Regular lending	113,707	114,189	108,544	114,124	104,029	110,730	119,518	121,584	139,737	110,311	80,544
SBA											
Business loans	(note f)	(note f)	-41,084	-57,658	-58,887	-81,353	-91,356	-203,059	-205,612	-258,454	-202,829
Disaster loans	(note f)	(note f)	-11,824	-16,316	-14,115	-26,843	-36,771	-66,579	-107,353	-98,330	-92,928
Emergency Loan Guarantee (note g)	-	-	-	-	-	-	-	1,744	3,422	5,051	7,104

a/Under the Department of Interior, FY 65 - FY 71.

b/Under the Department of Interior, FY 65 - FY 71.

c/Assume break-even operation during FY 65, FY 66, and FY 67.

d/Excluded from study; outstanding loans not reported for FY 74 and FY 75

e/Outstanding data not available. Assumed funds have been transferred elsewhere.

f/Aggregated figures equal: FY 1965 - $39,519; FY 1966 - $58,570.

g/Excluded from study; new program, with outstanding data, only available for years shown.

APPENDIX II

Table II-3

Appropriations Data for Selected Federal Credit Programs

	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
President											
Agency for International Development:											
Alliance for Progress	425,000	435,125	420,065	389,000	249,294	245,000	247,500	150,000	150,000	-	-
Development Loans	773,728	618,225	499,615	435,000	300,000	296,600	412,994	190,450	242,235	-	-
Foreign Loan Guarantee Fund	-	-	-	-	-	-	-	-	-	-	-
Common Defense, Econ. & Triangle	-	-	-	-	-	-	-	-	-	-	-
Housing Inv. Guarantee	-	-	-	-	-	-	-	-	-	-	-
Econ. Opportunity Loan	23,950	33,000	21,500	14,500	3,000	5,900	3,400	-	-	-	-
Foreign Military Sales	-	-	53,600	-	296,000	70,000	200,000	400,000	400,000	325,000	300,000
Appalachian Housing	-	-	-	1,000	1,000	1,000	1,000	500	3,500	1,500	-
Overseas Private Inv.	-	-	-	-	-	37,500	18,750	12,500	12,500	25,000	100
Agriculture											
Farmers Home Administration:											
Direct Loan Acct.	7,100	-	-	-	-	-	-	-	-	-	-
Emergency Credit Rev. Fund	-	30,000	-	-	-	31,918	65,000	-	-	-	-
Agric. Credit Insurance	-	-	-	-	-	-	-	37,192	56,762	74,554	485,262
Rural Housing Direct Loans	5,000	2,500	-	797	-	2,500	-	-	-	-	-
Self-Help Housing	-	-	-	-	600	1,000	400	-	3,000	-	-
Rural Development Insurance	-	-	-	-	-	-	-	-	-	-	17,446
Rural Housing Insurance	-	100,000	-	-	893	31	683	24,400	53,092	90,033	125,603
Econ. Opportunity Loan Fund	-	-	-	-	-	-	-	-	-	-	-
Rural Electrification	11,934	12,202	12,426	12,457	13,429	14,834	15,763	46,706	16,720	-	19,675
Commerce											
Maritime Administration	-	-	-	-	-	-	-	-	-	-	-
Econ. Dev. Admin. - Rev. Fund	59,500	-	-	55,000	49,995	50,000	50,000	-	-	20,007	22,900
National Oceanic and Atmospheric Administration											
Fisheries Loan Fund	-	-	-	-	-	-	-	-	-	-	-
Fed. Ship Financing	-	-	-	-	-	-	-	-	-	-	-
Defense											
Defense Prod. Guarantees	-	-	-	-	-	-	-	-	-	-	-
Health, Education, and Welfare											
Higher Education Facilities Loan Fund	-	-	200,485	925	104,827	4,575	4,649	4,692	4,598	4,288	3,936
Student Loan Insurance	-	50	3,200	-	-	10,826	18,000	12,765	46,640	88,668	197,600
Nurse Training Fund	-	-	2,000	51	245	1,604	1,241	1,640	1,984	-	1,732
Health Professions Education Fund	-	-	10,000	151	6,192	1,089	2,312	2,569	2,131	4,000	2,268
Med. Fac. Loan & Guarantees	-	-	-	-	-	-	-	50,000	2,500	-	-
Health Maintenance Organization Loan Guarantee	-	-	-	-	-	-	-	-	-	-	-

APPENDIX II

Table II-3 (continued)

	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
Interior											
Re. Fund for Loans	900	-	-	450	450	-	-	-	-	900	38,000
General Services Administration											
Def. Prod. Guarantees	-	-	-	-	-	-	-	-	-	-	-
Veterans Administration											
Direct Loans	-	-	-	-	-	-	-	-	-	-	-
Guaranteed Loans	-	-	-	665	7,129	4,764	4,756	4,638	4,501	4,139	1,828
Educ. Loan Fund	-	-	-	-	-	-	-	-	-	-	74,509
Housing and Urban Development											
New Communities	-	-	-	-	-	-	-	-	-	-	-
Public Facility Loans	-	-	342	2,344	3,161	3,148	2,971	3,131	3,116	2,900	2,163
Community Disposal	-	-	-	-	-	-	-	-	-	-	-
Housing-Elderly/ Handicapped	25,000	50,000	80,000	26,008	27,789	2,786	12,755	-	-	-	-
Federal National Mortgage Association											
Special Assistance	-	-	-	-	-	-	-	-	-	-	-
Management/Liquidation	-	-	-	-	-	-	-	-	-	-	-
Secondary Mkt. Operations	-	-	-	-	-	-	-	-	-	-	-
Government											
Special Assistance	-	-	-	-	-	-	6,079	9,601	9,971	8,544	8,077
Management/Liquidation	-	-	-	-	-	-	-	-	-	-	-
Federal Housing Administration	-	-	-	-	-	-	-	-	-	-	-
Rehabilitation Loan Fund	10,180	41,362	1,396	-	-	45,000	35,000	90,000	70,000	-	-
College Housing	-	-	1,541	21,221	53,929	53,929	39,904	22,752	13,374	13,350	15,143
Ex-Im Bank											
Regular lending	-	-	-	-	-	-	-	-	-	-	-
SBA											
Business loans	-	-	485	3,247	5,499	2,598	262,054	277,755	396,684	225,253	307,500
Disaster loans	-	-	440	1,995	3,828	179,993	365,000	172,354	1,857,248	1,602	91,762
Emergency Loan Guarantee	-	-	-	-	-	-	-	-	-	-	-

APPENDIX II

Table II-4

Outstanding Direct and Guaranteed Loans

Federal Credit Programs: 1965-1975

Agency	FY-1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
	(000 omitted)										
President	$ 2,153,336	$ 3,337,978	$ 4,481,046	$ 5,580,180	$ 6,356,338	$ 7,297,239	$ 8,347,976	$ 9,242,519	$ 8,987,347	$ 10,724,366	$ 11,220,941
Agriculture	6,803,394	7,444,436	8,344,865	9,482,133	10,474,601	11,777,273	13,591,358	15,728,915	18,003,314	20,315,995	25,028,200
Commerce	653,492	736,396	799,035	873,057	957,931	1,088,187	1,381,401	1,621,770	1,840,302	2,246,524	3,003,537
Defense	43,471	38,951	47,403	30,745	16,316	11,004	5,136	5,989	3,198	5,013	3,732
Interior	25,000	25,000	25,656	25,178	25,228	25,737	27,663	27,843	28,039	28,568	36,497
Veterans Administration	17,739,356	17,496,463	17,574,642	18,783,743	19,586,606	20,335,260	21,007,586	22,893,110	25,231,927	27,787,128	28,628,788
Health, Education, and Welfare	540,919	736,976	1,010,789	320,131	1,063,342	2,067,830	2,710,377	3,794,652	4,674,921	5,790,696	6,480,355
Housing and Urban Development	52,969,139	57,793,058	65,352,503	72,067,473	70,861,334	77,210,471	87,482,425	95,621,492	96,649,662	95,171,457	97,018,596
Export-Import Bank	4,873,436	5,134,675	4,863,585	5,806,346	6,553,481	6,835,226	7,125,085	7,971,728	9,249,800	11,189,274	13,020,381
SBA	925,419	1,842,098	1,670,767	1,893,028	2,019,553	2,331,665	2,759,915	3,709,091	5,354,936	6,354,788	6,811,691
Total	86,726,962	93,894,768	104,170,291	114,862,014	117,914,730	128,979,892	144,438,922	160,617,109	170,023,446	179,613,809	191,252,718

APPENDIX II

Table II-5

Dollar Value of Reported Profits and Losses

Federal Credit Programs: 1965-1975

Agency	FY-1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
	(000 omitted)										
President	$ 20,737	$ 32,125	$ 38,920	$ 55,258	$142,553	$139,025	$ 61,599	$-43,686	$289,088	$ 42,133	$235,015
Agriculture	8,461	14,513	5,737	-15,759	-83,272	-29,580	-139,656	-187,640	-855,736	-428,837	-561,157
Commerce	3,459	6,846	403	4,713	3,739	45	2,657	-8,598	-18,792	2,219	6,426
Defense	244	585	1,046	-1,922	-940	-95	228	-395	-286	50	-212
Interior	-721	597	241	1,256	552	643	568	405	929	923	798
Veterans Administration	-14,130	-15,631	1,642	7,420	14,541	35,075	22,117	2,861	-16,687	-19,900	-5,646
Health, Education, and Welfare	-	-	1,482	11	-2,464	-22,342	-23,536	-27,385	-252,267	-146,768	-222,033
Housing and Urban Development	43,218	40,091	79,149	95,614	82,140	112,444	50,831	-180,799	-527,169	-861,870	-1,055,746
Export-Import Bank	113,707	114,189	108,544	114,124	104,029	110,730	119,518	121,584	139,737	110,311	80,544
SBA	-39,519	-58,570	-52,908	-73,974	-73,002	-108,196	-128,127	-269,638	-312,965	-356,784	-295,757
Total	135,456	134,745	184,256	186,741	187,876	237,749	-33,801	-593,686	-1,554,148	-1,662,961	-1,817,768

APPENDIX II

Table II-6

Dollar Value of Appropriations

Federal Credit Programs: 1965-1975

Agency	FY-1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975
	(000 omitted)										
President	$1,222,678	$1,086,350	$994,780	$839,500	$849,294	$656,000	$883,644	$753,450	$808,235	$351,500	$300,100
Agriculture	24,034	144,702	12,426	13,254	14,922	50,283	81,846	108,298	129,574	164,587	647,986
Commerce	59,500	-	-	-	50,000	49,995	50,000	-	-	20,007	22,900
Defense	-	-	-	-	-	-	-	-	-	-	-
Interior	900	-	-	450	450	-	-	-	-	900	38,000
Veterans Administration	-	-	-	665	7,129	4,764	4,756	4,638	4,501	4,139	76,337
Health, Education, and Welfare	-	50	215,685	1,127	111,264	18,094	26,202	71,666	57,853	96,956	205,536
Housing and Urban Development	35,180	91,362	83,279	49,573	84,879	104,086	96,709	125,484	96,461	24,794	25,382
Export-Import Bank	-	-	-	-	-	-	-	-	-	-	-
SBA	-	-	925	5,242	9,327	182,591	627,054	450,109	2,253,932	226,855	399,262
Total	1,341,392	1,322,464	1,307,095	909,811	1,127,265	1,065,813	1,770,211	1,513,645	3,350,556	889,738	1,715,503

APPENDIX II

Table II-7

Proportions of Outstanding Loans Made by Each Agency

Federal Credit Programs: 1965-1975

Agency	FY-1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975	Average
	(percent)											
President	2.483	3.555	4.302	4.858	5.391	5.658	5.780	5.754	5.286	5.971	5.867	4.991
Agriculture	7.844	7.929	8.011	8.255	8.883	9.131	9.410	9.793	10.589	11.311	13.087	9.477
Commerce	.754	.784	.767	.760	.812	.844	.956	1.010	1.082	1.251	1.571	.963
Defense	.050	.042	.046	.027	.014	.009	.004	.004	.002	.003	.002	.019
Interior	.029	.027	.025	.022	.021	.020	.019	.017	.017	.016	.019	.021
Veterans Administration	20.454	18.634	16.871	16.353	16.611	15.766	14.544	14.253	14.840	15.471	14.969	16.251
Health, Education, and Welfare	.624	.785	.970	.279	.902	1.603	1.877	2.363	2.750	3.224	3.388	1.710
Housing and Urban Development	61.076	61.551	62.736	62.743	60.095	59.862	60.567	59.534	56.845	52.987	50.728	58.975
Export-Import Bank	5.619	5.469	4.669	5.055	5.558	5.300	4.933	4.963	5.440	6.230	6.808	5.459
SBA	1.067	1.226	1.604	1.648	1.713	1.808	1.911	2.309	3.150	3.538	3.562	2.140

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