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Federal credit programs include direct lending activities of Federal agencies and loans made by commercial lenders which are guaranteed by Federal agencies. Credit assistance provides an alternative to subsidies, tax benefits, price regulation, and other actions seeking to achieve policy objectives. Credit that is outstanding under these programs totals over $300 billion. Findings/Conclusions: Evaluation of Federal credit programs consists of determining whether the program is likely to achieve its social objective or whether it is superior to some other type of action and evaluation of program design. Federal credit can be more cost-effective than direct subsidies, but programs with high risk and low expected cash flow may require both a direct subsidy and Federal credit. GAO guidelines for program evaluation and design are: the economic advantage of a direct loan must be weighed against the fact that the interest rate on guaranteed loans is determined by the market while the direct loan interest rate is not; if a program is to be self-supporting, the loan guarantee fee or direct loan interest rate should be set according to risk; various mechanisms to control risk should be considered; the agency that bears responsibility for a program should be responsible for risk analysis; and administrative practices during a program's formative stages should include obligational authority, disbursement procedures, allocation of credit when demand exceeds the available authority, and encouragement of investment during recessionary periods. (HTW)

6555

Federal Credit Assistance

an approach to program design and analysis

UNITED STATES GENERAL ACCOUNTING OFFICE

PAD-78-31 **MAY 31, 1978**

PREFACE

Credit assistance, in the form of direct loans and loan guarantees, is one means of accomplishing 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.

Each approach has unique characteristics which make it more effective in some circumstances rather than in others. The purpose of this overview is to identify the important special characteristics of credit assistance and, thus, the circumstances in which this particular approach is most likely to be effective. It is intended to help those who are designing programs choose the most effective device for solving the problem at hand.

The best opportunity to achieve effective, efficient programs is in the early stages of program design. It is our hope that these suggestions and guidelines for designing credit assistance programs will enable decisionmakers to make a more knowledgeable choice among program mechanisms and to design more efficient credit assistance programs when that device is selected.

All Federal programs should be evaluated periodically to determine whether they are fulfilling their objectives. This is true for credit assistance programs as well as other Government programs. In analyzing the costs and benefits unique to credit assistance, we hope to show that these programs can be evaluated. The method of evaluation may differ from more traditional benefit-cost studies, but the goal is the same--accurate information on which to base decisions.

The report is directed to several groups:

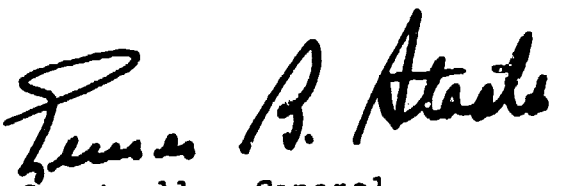
--Members of Congress.

--Congressional staff.

--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.

We invite comments and suggestions concerning this document.



Comptroller General
of the United States

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ABBREVIATIONS

FFB	Federal Financing Bank
GAO	General Accounting Office
MarAd	Maritime Administration
SBA	Small Business Administration

CHAPTER 1

INTRODUCTION

This report surveys the impact of Federal credit assistance programs and the criteria for choice, design, and administration of these programs. It describes how Federal credit programs affect lender and borrower behavior and compares the impact of Federal credit programs to the impact of direct subsidy programs. Based on this analysis, guidelines are suggested for designing Federal credit assistance programs.

Federal credit programs encompass all lending activities backed by the U.S. Government. These include direct lending activities of Federal agencies, including loans made through the Federal Financing Bank (FFB), and loans made by commercial lenders which are guaranteed by Federal agencies. Credit that is outstanding under these programs totals well over $300 billion. Since 1970, Federal and federally assisted credit advanced has comprised about 13 percent of funds advanced in U.S. credit markets.

These programs are diverse and the recipients represent all sectors of the economy.

--The programs range from hundred-million-dollar loans to large corporations down to very small loans to individual borrowers.

--Some programs, such as the Rural Electrification Administration's to finance electric and telephone facilities in rural areas, guarantee the full amount of the loan; others, like some of those of the Small Business Administration (SBA), require a private lending institution to bear part of the risk.

--Some loans, such as those of the Economic Development Administration to encourage industrial and commercial expansion in redevelopment areas, are backed by collateral; others, like that for the the construction of the Washington, D.C., metropolitan area subway, are not.

--Some loans, such as those given by the Housing and Urban Development New Communities Program, are individually negotiated; others, such as the Veterans Administration housing loans, are almost entitlement programs.

--Some programs provide for detailed oversight of the borrower by the responsible Federal agency; others involve little or no oversight.

--Some programs, such as the Maritime Administration (MarAD) Ship Construction Guarantee Program, show slight profits to the Government; most lose money.

In recent years, credit assistance has cost the Government more and more in cash payments for defaults. By our preliminary estimates 1/ for 1975, losses on guaranteed loans were about 1.3 percent of loans outstanding, or about $1.9 billion. Direct-loan losses were about 2.1 percent of loans outstanding, or about $1.0 billion. The total benefits to recipients from interest-rate reductions in 1975 amounted to about $2.1 billion on guaranteed loans and $1.3 billion on direct loans. These figures are summarized in table 1.

During the past decade, Federal credit programs have grown in number, diversity, and amount borrowed. The Office of Management and Budget estimated that the annual growth in Federal credit (9.6 percent) during the decade 1968-78 just about equalled the rate of growth of overall budget expenditures (9 percent) for the same decade. 2/ However, within this growth, there have been significant departures from traditional patterns. In 1956, for example, almost all guaranteed loans were for home mortgages, but by 1976, guaranteed loans had expanded into such new areas as transportation, energy, and assistance to municipalities.

1/The methods for making these estimates are described in a forthcoming GAO report, "Costs and Subsidies from Federal Credit Assistance Programs."

2/Testimony of W. Bowman Cutter, Executive Associate Director for Budget, Office of Management and Budget, before the Subcommittee on Economic Stabilization of the House Committee on Banking, Finance, and Urban Affairs on Mar. 29, 1977.

Table 1

Selected Characteristics of Federal Credit Assistance Activity

	Guaranteed (Primary)	Direct
	($ billions)	
Total loans outstanding (note a) at end of FY 1979 (est.)	223.6	137.2
Total loans outstanding (note b) at end of FY 1975 (est.)	158.7	74.1
Total gross loans disbursed (note b) during FY 1975 (est.)	26.5	28.8
OMB estimate of present (note c) value of subsidy on loans made during FY 1975*	1.2	5.2
GAO estimate of losses on loans outstanding during FY 1975**	1.9	1.0
GAO estimate of subsidy on loans outstanding during FY 1975**	2.1	1.3

* Incomplete coverage of programs.

** Preliminary.

a/Special Analysis: Budget of the United States Government, Fiscal Year 1979, Tables F-2 and F-5.

b/Special Analysis: Budget of the United States Government, Fiscal Year 1977, Tables E-3, E-4, E-6, and E-7.

c/Special Analysis: Budget of the United States Government, Fiscal Year 1977, Table E-12.

There are two main reasons for this increased growth and diversity. One is that Federal credit programs are subsidy programs that serve particular classes of borrowers and projects very well. These programs usually require massive capital outlays and are too risky for private lenders to undertake at reasonable interest costs. As subsidy programs, Federal credit programs confer benefits on credit recipients. However, they also impose costs on the Federal Government and indirect costs on firms and individuals not directly involved with the programs.

Another reason for growth in Federal credit programs is the budget treatment they receive. Some direct loan programs are statutorily excluded from the budget. That is, the amounts spent for these programs are simply not counted when the budget is added up. With respect to guaranteed loans, outlays show up in the budget only when Federal dollars are paid out, usually resulting from of a default and generally long after the decision to guarantee the loan has been made. In either case, therefore, the costs of credit assistance tend to be hidden and programs do not compete for budget resources like direct expenditure programs do.

The proliferation and diversity of new Federal credit programs raises questions about the advantages and disadvantages of this form of Federal assistance. Unquestionably, Federal credit programs have a useful role, but criteria are needed for deciding when to use Federal credit and how to structure the programs for maximum efficiency. For this purpose, information on how the programs work and what they accomplish is essential.

This report is meant to provide guidance in deciding when to use Federal credit as the subsidy device, in evaluating existing loan programs, and in developing new programs. The report is directed to several groups:

--Members of Congress.

--Congressional staff.

--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.

Chapter 2 discusses the effectiveness of Federal credit programs in stimulating desired activity. Like other subsidy programs, the cost-effectiveness of Federal credit programs should be evaluated to determine whether they are meeting their objectives, how valuable these objectives are to society, and how much the programs cost. This chapter indicates that Federal credit programs are most effective per dollar spent by the Government when uncertainty rather than lack of profitability is the barrier to overcome.

Chapter 3 discusses the issues and alternatives involved in structuring a Federal credit program. First, the decision on whether to subsidize a sector should be made. Then the type of subsidy must be chosen; that is, when should a loan guarantee be used rather than a direct loan, a direct subsidy, or a price subsidy? Finally, if credit assistance is the appropriate mechanism, what are the best options for the design and administration of the program?

CHAPTER 2

HOW FEDERAL CREDIT PROGRAMS WORK

Federal credit programs stimulate actions that the recipient otherwise would not take by shifting risk from the private sector to the Government. The purpose of this chapter is to show how Federal credit programs create this stimulative effect. First, a framework is set in which Federal credit programs can be analyzed. Then, the concept of financial risk is defined and discussed. The effects of Federal credit on lenders and borrowers are discussed within this framework, using the concept of financial risk. The chapter concludes with a sample analysis of a guaranteed loan.

FRAMEWORK FOR ANALYSIS

We use an indirect approach to evaluate the effectiveness of Federal credit programs in stimulating certain actions by the recipient. Direct cash subsidies are used as a standard for comparison with Federal credit programs. The advantage of this standard is that the costs to the Government and benefits to the firm of direct subsidies are known. A direct subsidy of $X costs the Government $X and has a value to the recipient of $X. Any other type of subsidy program can, at least in theory, be compared to a direct subsidy.

In the case of loan guarantees, the comparison can be made along the following lines. Suppose the Government guarantees a loan to the firm with expected cost to the Government of $X. The expected cost to the Government would be the possible default losses on the loan times the appropriate probabilities of various sizes of defaults. To determine the value of the loan guarantee to the recipient, we must assume that the recipient would be forced to operate under the same conditions as those that would be faced by the recipient of a direct subsidy for the same purpose. We can then compare a loan guarantee whose expected cost to the Government is $X to a direct subsidy with the same cost. If the benefit to the recipient exceeds that cost, then the loan guarantee is more cost-effective than a direct subsidy. But, if the value to the recipient is less than the cost to the Government, the loan guarantee is less cost-effective than the direct subsidy.

For example, suppose that the Government can either give a firm a direct cash subsidy of $1,000 or can guarantee a loan for $100,000. Suppose also that the firm has one chance in one hundred of defaulting on the loan guarantee. Then the

expected costs to the Government of the two forms of subsidy are the same. However, the value to the firm of the $100,000 loan guarantee may be more or less than $1,000. If the loan guarantee is worth more than $1,000 to the firm, the loan guarantee is the more efficient form of subsidy. If it is worth less than $1,000, the direct subsidy is more efficient.

It is important to recognize that this analysis addresses only the relative efficiency of the two methods of providing a subsidy. It will not reveal the extent to which the program as a whole is cost-effective. To measure absolute cost-effectiveness would require, in addition, an assessment of the firm's actions and how they were altered as a result of receiving the subsidy. It is possible, of course, to choose the most efficient device for providing a subsidy and still have an ineffective program. (That is, the actions resulting from the efficiently provided subsidy may not be worth the cost.)

Approach taken

> A Federal credit program is compared to a direct subsidy operating under the same constraints as the credit program, whose cost to the Government is the same as the cost of the credit program.

The major advantage of this approach is that it abstracts from the question of whether some kind of subsidy is to be given. As a result, one can assume that the decision to subsidize has been made and consider the pros and cons of alternative subsidy programs.

However, this approach cannot answer several important questions which should be addressed in a program's full-scale evaluation. For example, what proportion of activity undertaken under a given subsidy program is new activity and what proportion would have been undertaken anyway? In the student loan program, one would like to know how many students would have used other sources of finance, such as gifts from their parents or borrowing using their parents' credit, received student loans versus how many students who would not otherwise attend school received student loans. This problem in evaluating a subsidy program is not unique to Federal credit programs. For example, one could ask the same questions of a scholarship program financed by the Federal Government. The comparative efficiency approach can shed some light on this question, even though it cannot provide definitive

answers. If the value of a loan guarantee (or direct loan) to the recipient exceeds the value of an alternative subsidy program, then the Federal credit program is likely to stimulate more new activity than the alternative would.

Another issue not directly addressed in this framework is the effect of Federal credit in distorting the ratio of capital to labor. Federal credit programs usually subsidize capital, which means that this type of program lowers the effective price of capital relative to labor. This induces the recipient to select a technology that is more capital-intensive than is called for. For example, loans and capital grants for mass transit may have induced local authorities to concentrate upon subway systems, when various "low-capital" alternatives (bus and carpool lanes on highways, better bus service, etc.) might have improved urban transportation more efficiently.

Direct subsidies can encourage capital- or labor-intensity (e.g., a subsidy on wage rates), or they can be neutral. It depends upon the program's specifics. In any case, effects on the capital-labor ratio are an important consideration for comparing alternative programs.

Another effect of Federal credit is that it increases the debt of the firm relative to equity. As a result, the firm's probability of bankruptcy increases, which in turn may decrease the value of equity.

Regardless of which method of subsidization is chosen, the subsidized activity will displace similar unsubsidized activities. Even a credit assistance program that does not lose money imposes certain costs elsewhere in the economy. Because credit is allocated to certain borrowers, other potential borrowers may be "crowded out" of the market. In fact, any subsidy program will impose some kind of cost on the unsubsidized sector. There is no such thing as a "free lunch." Thorough analysis is needed to measure this kind of cost. We do not deal with it here because we are primarily concerned with alternative methods of providing a subsidy, rather than with analyzing program impacts in their entirety.

FINANCIAL RISK AND RETURNS

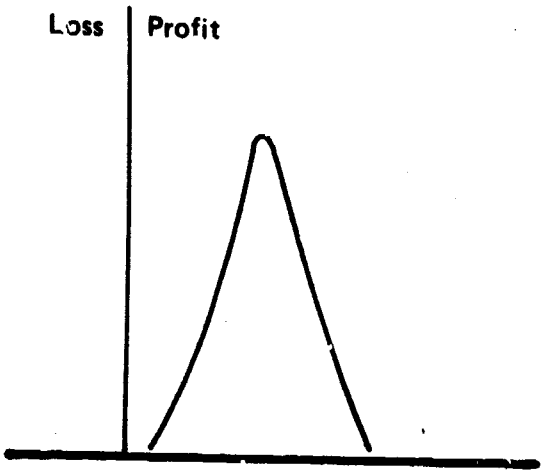
Federal credit programs raise the value of an investment to the borrower by reducing risk and increasing the expected return. These are two distinct concepts. This section discusses the distinction between risk and return and describes investor and Government preferences regarding both.

The present value of cash flow from an investment represents today's value of all future returns received from the investment. Since the outcome of an investment is uncertain, the present value of the cash flow may take on any one of several values. Figure 1 illustrates four different distributions of possible present values of cash flow from an investment. The area under the curve between any two points indicates the probability that the cash flow will lie between those points. The most likely cash flow is at the highest point of the curve and the likelihood of each level of cash flow decreases as the curve declines from this point. A sharp decline in the curve, such as in curves A and B, indicates that there is only a small chance that the actual cash flow will differ greatly from the most likely cash flow; there would be relatively little risk attached to the project. On the other hand, if there is a gradual decline in the curve, such as in curves C and D, the widely different cash flows may have only a slightly smaller chance of occurring than does the most likely one, and the project would be viewed as being relatively risky.

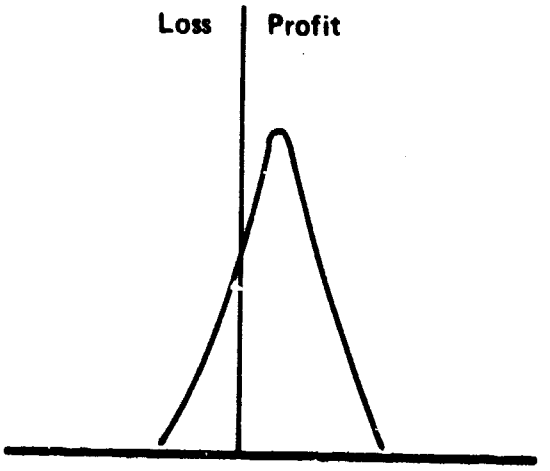
Low-risk projects are projects for which the returns are almost certain, although the certain returns may be high or low. U.S. Treasury bills represent the investment that is closest to being risk-free; they guarantee an almost certain return. On the other hand, investments in research and development, such as for experimental energy technology, are very risky. The money spent may produce nothing or the technology achieved may provide riches for the investor.

In figure 1, distributions A and B represent the same risk (the curves have the same shape), but the expected return from A is higher than the expected return from B (the peak of the curve for A is farther into the "profit" range than for B). Similarly, distributions C and B represent the same risk but the expected return from distribution C is higher than from D. A rational investor would prefer A to B and C to D. Distributions A and C (or B and D) have the same expected return, but distribution A has less risk than C and distribution B has less risk than D.

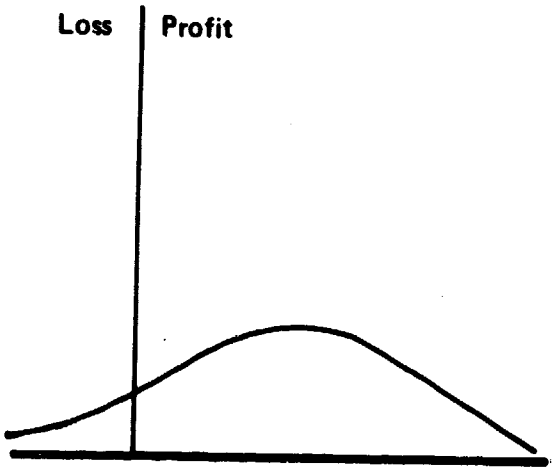
Figure 1



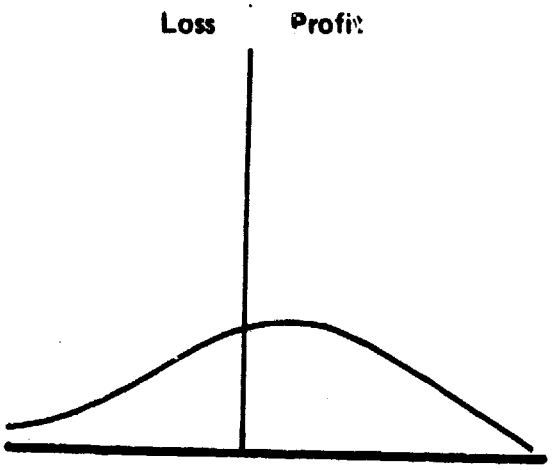
A: High Return
Low Risk



B: Low Return
Low Risk



C: High Return
High Risk



D: Low Return
High Risk

ALTERNATIVE CASH-FLOW
DISTRIBUTIONS

A Problem in Semantics: Risk versus Return

> In figure 1, we have said that distributions A and B have the same degree of risk because they have the same dispersion of possible returns around their respective mid-points. In contrast, "risk" could be defined as "probability of loss," in which case B would be riskier than A. While this definition is perhaps more common, our definition of risk as dispersion of possible outcomes is more useful for present purposes.

Most investors and lending institutions prefer reduced risk. This behavior is called risk averse. The risk-averse investor prefers distribution A to C and distribution B to D. For the risk-averse investor, the higher probability of a large gain in distribution C than in A is more than offset in the investor's mind by a possible loss with distribution C--a possibility that is almost nonexistent with A. For example, a risk-averse investor would prefer to invest in Treasury bills with a certain return of perhaps 8 percent, than in an experimental energy technology whose possible returns vary widely, but whose expected return is 8 percent. A larger expected return from the risky energy technology investment would be necessary to induce the risk-averse investor to switch from Treasury bills. The necessary difference in the rate of return would depend upon the extent of the difference in risk.

On the other hand, a gambler who bets in a casino, where the odds are against him, exhibits what is called risk-taking behavior. The risk-taker prefers distribution C with its large possibility of high gains to A and prefers distribution D to B. A risk-neutral investor is indifferent to risk and is concerned only with expected return. Such an investor does not make a distinction between distribution A and C, although he prefers either of these distributions to B or D.

In summary, the preferences of the risk-averse investor are for more return at a given level of risk and for less risk at a given level of return. Such an investor prefers distribution A to distribution B or C. He prefers either distribution B or C to D. More information would be needed to know whether he prefers B or C or is indifferent about them.

An example may make these distinctions more clear. Suppose an individual is offered a choice of $1 for sure or a 50/50 gamble between gaining $101 and losing $99. The gamble has an expected return of $1. The risk-averse individual takes the certain $1, the risk-taker gambles, and the risk-neutral individual is indifferent about the options.

One commonly used statistical measure of risk is variance, which weighs the distance of possible returns from the expected return by the likelihood that each return will occur.

Empirical analysis has shown that lending institutions are risk averse. As a result, the rate of interest charged by a private lender includes a risk premium which is the amount of interest payments above what would be charged on the least risky loan. The riskier the loan, the larger the risk premium required by the lender, and the higher the interest rate the borrower must pay to obtain the loan. Some economic theorists have argued that a Government should be risk neutral or less risk averse than lending institutions because its risks are spread across a more highly diversified portfolio and its realized losses are spread among the entire population. 1/ As a result, a Government can afford much broader variations in the returns on its individual investments. One of the basic assumptions underlying our analysis is that the Government should be relatively less risk averse than an individual firm.

For purposes of analysis, we make the following:

Assumption

The Government is risk-neutral in its decisionmaking.

This assumption is illustrated by figure 1. It means that the Government would be indifferent about distributions A and C, which have the same expected return but different degrees of risk. Although this assumption may not always be exactly satisfied, it simplifies but does not substantially change the results of the following analysis.

Both the lender and the borrower may benefit from the reduced risk that results from loan guarantees. The lender benefits because the Government removes the risk of the loan

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1/Arrow, Kenneth J. and Robert C. Lind, "American Economic Review," (Uncertainty and the Evaluation of Public Investment Decisions), 1970, pp. 364-378.

from the lenders. In general, the riskier the loan, the larger the risk-reduction effect. These effects of risk reduction may be passed on from the lender to the borrower through lower interest rates. In addition, some forms of loan guarantee reduce risk to the borrower directly by relaxing collateral requirements. The value of lender risk reduction is discussed next, followed by a discussion of borrower risk reduction. The chapter concludes with a case study applying this method of examining a loan for ship construction.

LENDER RISK REDUCTION

The major intended consequence of Federal credit programs is reallocation of resources by shifting risk from a commercial lender to the Government, resulting in lower interest rates to the borrower. 1/ Thus, the value to the borrower of lender risk reduction is reflected in the change in the interest rate paid by the borrower. For example, a 100-percent guaranteed loan should (at least in principle) induce the lender to charge a risk-free interest rate. 2/ This results in an interest-rate savings for the borrower which consists of two parts--an adjustment for the change in the lender's expected returns since payment is assured, and a value for the reduction in the variation of possible returns to the lender because returns are certain as long as the loan is held to maturity. Thus, risk is eliminated with a guarantee. The cost to the Government consists only of the expected cost of default and the cost of administration--a cost we will assume is equal to the cost of administering the comparable direct subsidy. Due to the risk neutrality assumption, the risk-reduction effect is virtually costless to the Government. Appendix I elaborates on these points. Thus one part of the savings to the firm, that one resulting from risk reduction, is costless to the Government.

1/In some cases, the prospective borrower may have been unable to obtain a loan. The lender may have been unwilling to make high-risk loans, even at interest rates high enough to cover the likelihood of loss. This is the "risk-averse" behavior mentioned earlier.

2/However, the interest rate charged on the guaranteed loan will be higher than the Treasury rate on issues of the same maturity, because the guaranteed loan interest rate includes a premium for the market's lack of liquidity for guaranteed loans and because the opportunity cost of funds to the guaranteed lender is higher.

In the case of a loan guarantee, the effect on the borrower of the lower interest rates achieved through lender risk reduction is to decrease the borrower's interest payments and to increase his net expected cash flow on a project. The riskier the project and the borrower, the greater the interest-rate reduction. That is, the magnitude of the subsidy clearly depends upon the riskiness of the borrower and the project--this is the peculiarity of Federal credit as a subsidy. The riskier the borrower appears to the lender, the more valuable the guarantee is to both of them. This feature makes loan guarantees a powerful policy instrument in some circumstances, but ineffective in others. For example, if the Government wished to persuade General Motors to build smaller cars, offering a loan guarantee would have little effect because General Motors' debt already is considered to be an almost perfectly safe investment and a guarantee would not reduce its interest rate.

We conclude that the benefit to the firm of reduced interest rates is at least as high and almost always higher than the expected cost to the Government of guaranteeing the loans. The benefit to the firm includes both the value of risk reduction and increased expected value, whereas the cost to the Government includes only the increased expected value to the firm but no cost for increased risk since, by assumption, the Government is risk-neutral. 1/

In direct loan programs, there is no lender risk reduction since no private lender is involved. The Government assumes the risk and, in addition, charges an interest rate lower than what the firm would pay for a private loan. In most cases, a direct loan has an interest rate lower than a guaranteed loan, since the Government may not attempt to make a profit as a private lender would.

BORROWER RISK REDUCTION

Some Federal credit programs also reduce risk to the borrower from what it would be with a commercial loan. Loans that are of the non-recourse or partial-recourse variety reduce borrower risk. Non-recourse loans are loans on which the

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1/ The reader is reminded that allocation of credit to the favored firm will affect credit markets in such a way that unassisted borrowers will find it more difficult to obtain credit.

Government can collect nothing in the case of default; partial-recourse loans mean that the Government can collect some defaulted assets but not necessarily assets whose value is equal to the loan's face value. A full-recourse loan means that the Government can collect on all assets up to value of the loan.

Several institutional arrangements result in partial- or non-recourse loans. Loans to municipalities and other Government agencies fall in this category. If the Washington, D.C., Metro subway system defaults on its guaranteed obligations, it would be impractical for the Federal Government to repossess part or all of the system, since a defaulted system presumably would be incapable of generating enough net revenue to pay off the debt and would have negligible market value. Partial- or non-recourse loans to industry can take two forms. Some firms set up sole-purpose subsidiaries, whose only assets are those for which the loan guarantee is made. The parent corporation does not stand behind the loan. For example, the ship construction loan guarantee program allows firms to set up subsidiaries whose only assets are the ships financed by the guaranteed loan and enough other equity to meet the program's covenants. The other mechanism available to set up non- or partial-recourse loan programs is direct specification in the enabling legislation. In addition, some loan programs to individuals such as the student loan program 1/ and some Small Business Administration 2/ loan programs, are in fact, if not in intent, partial-recourse programs because of both the limited enforcement resources of the Federal Government and the bankruptcy laws.

There are three effects from the borrower's viewpoint of the partial-recourse feature: (1) increased likelihood of default, (2) increased expected returns of the investment, and (3) decreased variation of returns on the investment as explained below. These effects of the partial-recourse feature are illustrated in the distributions of possible cash flow from the investment depicted in figure 2. The most likely cash flow is where the curve is highest and the likelihood of each level of cash flow decreases as the curve

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1/"The National Direct Student Loan Program Requires More Attention by the Office of Education and Participating Institutions," GAO report (HRD-77-109), June 27, 1977.

2/"The Small Business Administration Needs to Improve Its (7a) Loan Program," GAO report (GGD-76-24), Feb. 23, 1976.

declines. In the full-recourse loan represented by figure 2A, since most of the area under the curve is to the right of zero, the investment represented will probably be profitable, but the points to the left of zero represent some possibility of a loss. The expected rate of return is point E, which has an equal area under the curve to each side of it.

The increased probability of default arises because the assets which the firm could lose if it were to default are limited. The firm will default if its projected losses on a project are more than it would lose in the event of default. If the value of the collateral that would be collected from the firm in the event of default is c, then as illustrated in figure 2B, the firm will default if it anticipates cash flow of -c or less. Thus, the firm will be willing to cut its losses sooner than if it had more to lose from default.

For purposes of analysis, the value of the non-recourse feature to the firm is broken into two components: the value of the increase in expected returns and the value of the decrease in risk. The increase in the firm's expected returns due to the partial-recourse provision results from the fact that the partial-recourse feature gives the firm a smaller maximum loss than when there is full-recourse. The value to the firm of this provision is equal to the Government's cost because the Government has to repay whatever part of the loan on which the firm defaults. In terms of the diagram, the expected rate of return increases from E to E'.

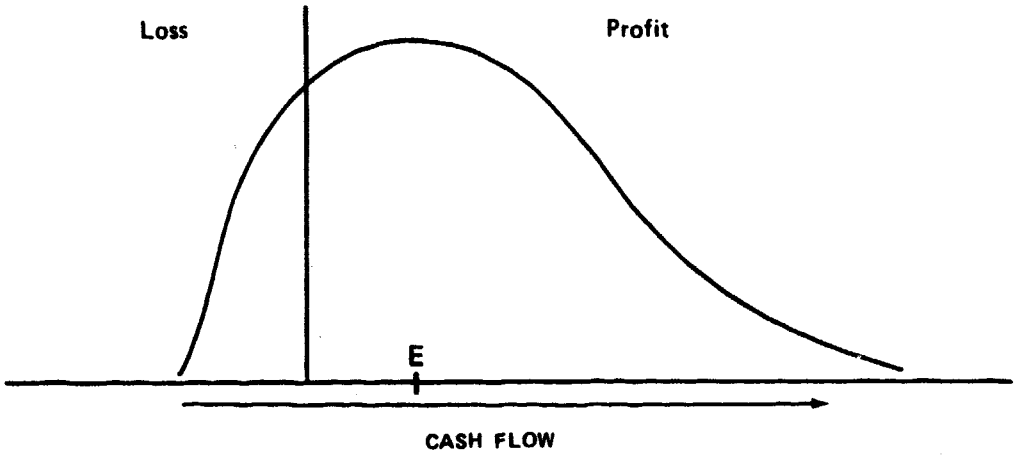
The variation of future returns decreases as a result of the decrease in the difference between the minimum and maximum returns. Figure 2 shows this decreased variation because the range of possible outcomes in 2B is narrower than in 2A. The benefit of decreased variation is of some value to the risk-averse firm but is costless to the Government because of the risk-neutrality assumption.

AN EXAMPLE

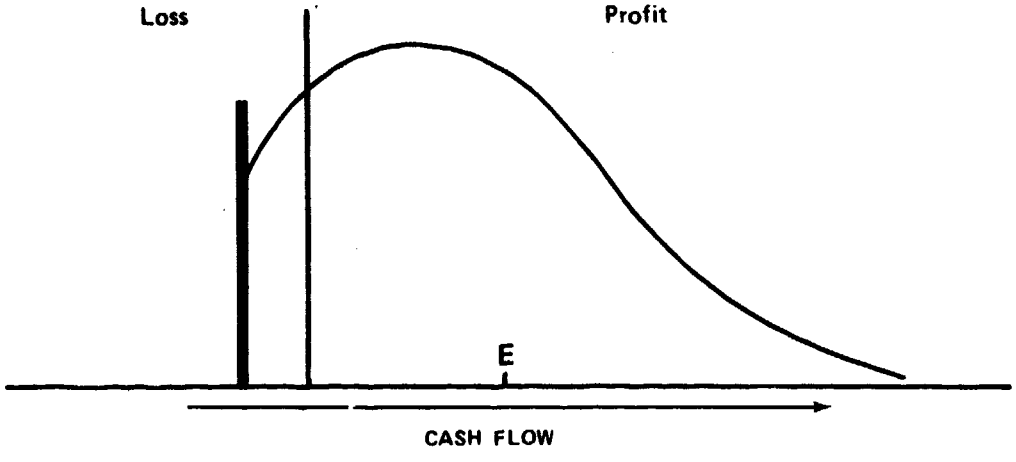
This example is based on actual data for an actual shipbuilding company, which we will refer to as the "Z Corporation." In 1976, the Z Corporation set up a subsidiary through which it received a Government-guaranteed loan of $152 million to construct and refinance several ships. This loan amounted to 75 percent of the cost of construction. The parent company contributed enough equity to the subsidiary to make the sub-

Figure 2

A: FULL RECOURSE LOAN



B: PARTIAL RECOURSE LOAN



sidiary's debt/equity ratio equal to 4:1. In addition, it pledged two ships worth enough to make the ratio of debt to total equity plus the value of the two pledged ships equal to 2:1.

Lender Risk Reduction

For the Z Corporation, certain information was available that made it easy to compute interest subsidy. At the time that the guaranteed loan was made, it had another loan outstanding that had a market yield to maturity in 1984 of 10.25 percent. The guaranteed loan made to the subsidiary was a serial issue with yields, at the time of issue, ranging from 5.55 percent for 6 months to 8-1/2 percent for long-term issues. The issue due in 1984 had a yield of 8 percent. Thus the difference between the unguaranteed and guaranteed issues due in 1984 was 2.25 percent, the amount used to compute the interest subsidy. However, the subsidiary did not receive the full 2.25-percent subsidy. It paid the Government a 0.75-percent loan-guarantee fee. Hence, the interest rate was reduced by 1.5 percent. Assuming a 50-percent corporate income tax, the subsidy after taxes would be 0.75 percent. Thus, the initial annual value of the interest subsidy is 0.75 percent of $152 million, or $1.440 million.

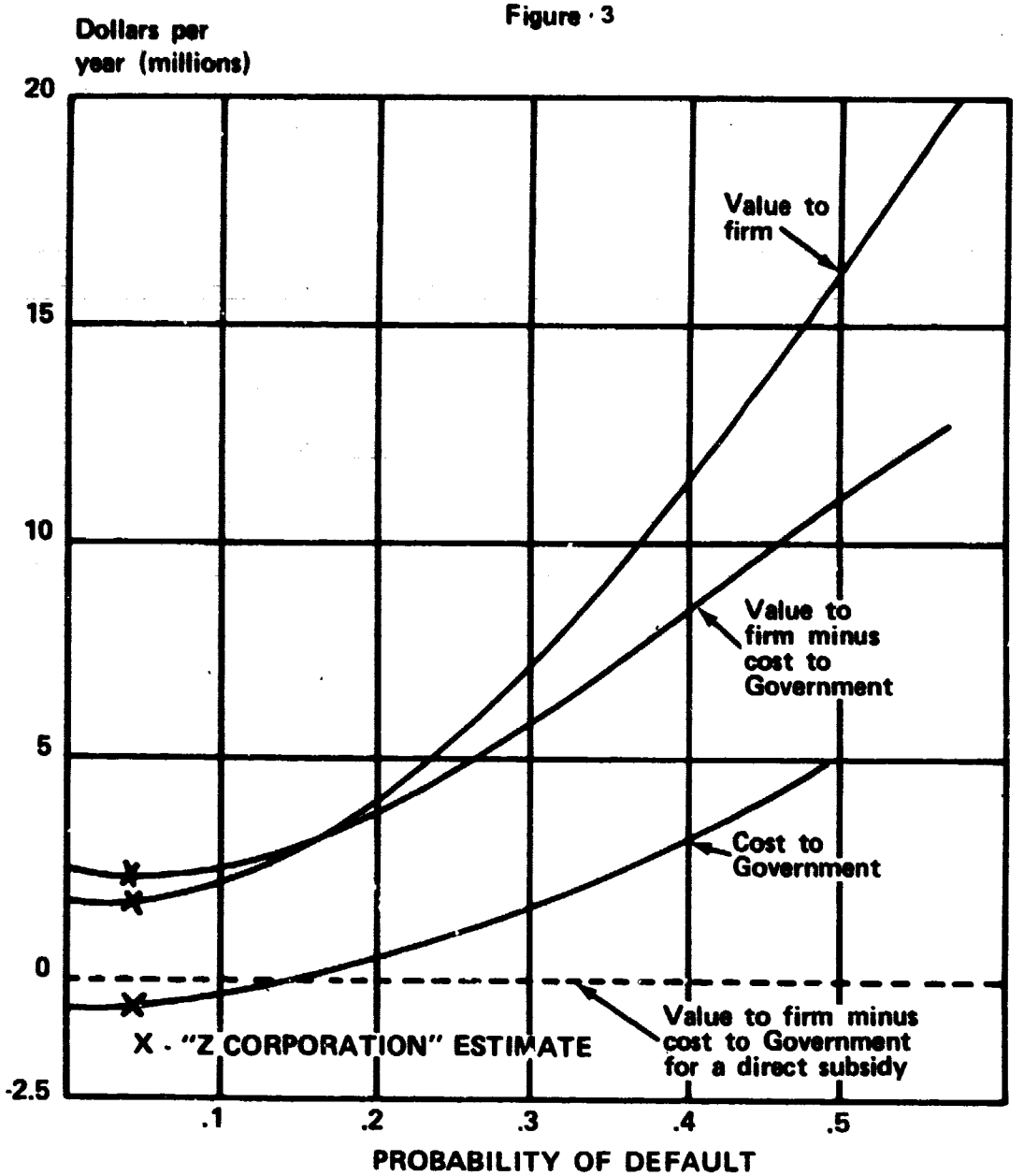
Partial-Recourse Provision

Extending the analysis presented on page 16 and in appendix I we estimated the value of the partial-recourse provision to the Z Corporation and its cost to the Government. Not knowing the true probability of default, we devised a procedure to estimate costs and subsidies for any specified probability of default. The results are shown in figure 3. The exact position of the curves on the diagram depend upon mathematical analysis not presented here. As illustrated, the subsidy from this provision on a $152 million loan is about $30,000 for a 0.01 probability of default, $744,000 for a 0.05 probability of default, $2.3 million for a 0.1 probability of default, and $8.3 million for a 0.2 probability of default. Given that the default probability is less than 0.17, the guarantee fee covers the expected cost of default.

Figure 3 illustrates two points that apply generally to the partial-recourse provision (and to other means by which the Government relieves a firm of risk).

First, the greater the risk the greater the value of the guarantee to the firm, which has been discussed earlier.

Figure · 3


Dollars per year (millions)
20
15
10
5
0
-2.5
.1
.2
.3
.4
.5
PROBABILITY OF DEFAULT
Value to firm
Value to firm minus cost to Government
Cost to Government
Value to firm minus cost to Government for a direct subsidy
X - "Z CORPORATION" ESTIMATE

Second, the subsidy to the firm is greater than the cost to the Government for the entire range of possible risks. As explained earlier, the firm receives implicit benefits in two forms: increased expected value of its investment (due to the elimination of possible losses) and decreased risk (due to the reduction in dispersion of possible outcomes). The first of these is a cost to the Government because it bears losses if they occur. The second benefit, however, is not a cost to the Government under the assumption of risk-neutrality.

SUMMARY

Federal credit programs are a type of subsidy program and can be compared to direct subsidy programs with the same operating restrictions. The subsidy from Federal credit arises because the Government takes over the risk from the private sector. Since the private sector is risk averse and the Government is virtually risk neutral, Federal credit can be more cost-effective than direct subsidies, especially in cases involving substantial risk. Some programs which are characterized by both high risk and low expected cash flow may require both a direct subsidy and Federal credit. The risk reduction by Government guarantees always involves shifting risk from the lender to the Government. In non-recourse or partial-recourse loans, risk is also shifted from the borrower to the Government.

CHAPTER 3

CHOICE, DESIGN, AND ADMINISTRATION OF FEDERAL CREDIT PROGRAMS

In evaluating Government programs, it is necessary to distinguish between social goals and the means to achieve these goals. It is not the evaluator's business to judge the merits of social goals, for these judgments are fundamentally political. Analysis and evaluation are supposed to determine the best means of achieving goals and how much it would cost. Such analysis may imply that achieving a certain goal would cost so much that the goal should be abandoned or changed, but this too is a political judgment.

The process of evaluating a proposed or existing Federal credit program consists of three steps. First, it should be determined whether Government action is likely to achieve the social goal in question with some degree of efficiency; second, assuming that some Government action is appropriate, it should be determined whether a Federal credit program is superior to some other type of action; and third, assuming that Federal credit assistance is called for, the program design must be evaluated.

IS A PROGRAM NECESSARY?

First, one should consider why the program's objectives are not met through the market mechanism and whether any Federal subsidy could correct the problem. That is, will a subsidy actually alter recipients' decisions and cause desired behavior to occur? For example, it is presumed that without subsidies, ships for commercial trade would not be built in the United States because of the high wage and materials cost.

When the subsidy is embodied in a credit program, lenders' behavior must also be taken into account. It could be the case, for example, that a project's riskiness, such as to some small businesses, would prevent lenders from making funds available at a reasonable interest rate. In these cases, loan guarantees could induce lenders to extend more credit than they otherwise would. On the other hand, we should be alert to the possibility that a subsidy program merely rewards people for what they would do anyway and thereby increases their returns or that the subsidy is too small to influence their behavior.

Another economic consideration is that in an economy operating near full capacity, one investment "crowds out" or replaces another. That is, some prospective borrowers who would have received credit are denied it because the guaranteed borrowers get the money that others would have borrowed. There is a tradeoff between subsidized investment and crowded-out investment. Government-guaranteed securities are more saleable than nonguaranteed securities and, consequently, may crowd out other borrowers. By providing credit, the Government decides that guaranteed borrowers should receive preference in the capital market over other borrowers. The degree of crowding out increases as the economy approaches full capacity. And, if there is crowding out, the impacts of Government-assisted borrowing will depend not only on the degree of crowding out but also on the excluded borrowers' identify.

Unfortunately, these side effects are difficult to quantify. However, the level of exclusion and the identity of excluded borrowers will be approximately the same for all methods of subsidy. The level of exclusion will vary with the level of economic activity. At high levels of activity there would be a higher degree of crowding out, while in a depressed economy there may be little or no crowding out, as long as there is a relatively easy monetary policy in effect. Identifying the potentially excluded borrowers is important in evaluating impacts. There is substantial empirical evidence that mortgage borrowers and small business are the first excluded from the financial markets, followed by State and local governments. 1/

GAO Guideline

> When deciding to subsidize some sector, whether through a credit program or another device, decisionmakers should determine whether the recipient should be supported by a Federal program, why the objectives of the program are not being met by the market, whether a subsidy could correct the problem, and what other enterprises would be crowded out of the economy by a subsidy. Federal credit programs should be treated the same as direct subsidy programs for the purpose of authorization and termination or extension.

1/Smith, Warren L., "Readings in Money, National Income, and Stabilization Policy" (Monetary Policy and the Structure of Markets), Warren L. Smith and Ronald L. Teigen, eds., 1965.

WHAT TYPE OF SUBSIDY PROGRAM?

Once it has been decided that a subsidy is appropriate to achieve a particular objective, the method of subsidy should be determined. Credit assistance programs are one possible approach, but there are many such alternatives, as direct subsidies, tax credits for investment, price supports, direct Government ownership, and tariff protection.

Credit assistance programs are subsidies. If they appear otherwise it is only because the subsidy's magnitude is difficult to measure. Conceptually, any credit assistance program confers a benefit which is the equivalent of some dollar amount of direct subsidy.

In somewhat simplified terms, the value of the credit subsidy depends upon the reduction of interest rates to the borrower and the size and duration of the loan. If a credit program reduces the available interest rate on a $100,000 loan by 2 percent, then the borrower saves $2,000 a year (before taxes). Thus, the credit program is roughly equivalent 1/ to a subsidy of $2,000 a year for the life of the loan.

In choosing the right kind of program, the problem is to determine, in each case, how to achieve program objectives at the lowest cost and with the least disruption of normal private sector functioning. The factors to consider include the characteristics, needs, and motivations of the recipients and the way they are viewed by lenders.

In an evaluation of Federal credit, the mechanism must be distinct from the ultimate objective. A Federal credit program makes funds available to the borrower at lower interest rates, but this is a means, not an end. The final desired impact might be to increase consumption of some good, such as housing, or to increase domestic production of some goods, such as ships or energy. In some cases, the objective may simply be to transfer money to recipients through interest-rate reduction. Ideally, Federal credit programs would pick up that little band of borrowers who would be unable or unwilling to

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1/As discussed in chapter 2, the analysis becomes more complex when the concept of risk is introduced. Also, as mentioned on page 8, direct subsidies and credit subsidies have different effects on the firm's capital-labor ratio and debt-equity ratio. Finally, a direct subsidy of $2,000 a year might not make an immediate investment of $100,000 by the firm possible.

undertake the desired activity without the subsidy; but, in fact, it is almost impossible to identify these borrowers. The underlying question is: How effective and efficient is the mechanism of Federal credit in achieving the program's ultimate goals?

The major issue in evaluating alternative subsidies is the relative efficiency of each type of subsidy in promoting program goals. Efficiency, in this case, means degree of goal attainment per dollar spent by the Government. Other relevant issues in selecting a subsidy are compatibility with other Federal programs and the effects on credit markets.

A subsidy's efficiency can be measured by comparing its value to the recipient with its cost to the Government. The direct subsidy makes the best standard with which to compare other alternatives given the same restrictions on operations as a condition of receipt of the subsidy, because for the direct subsidy the dollar cost to the Government equals the dollar value to the firm. Other subsidies can be compared to Federal credit by first comparing each subsidy with a direct subsidy. If the borrower is in a precarious financial condition or if the project is risky, then Federal credit could be expected to have a major effect on the interest rate, thus raising the subsidy's value.

Another factor to consider is: Which recipients in a given class is the subsidy intended to serve? If the Government wishes to spread the subsidy evenly among risky and nonrisky recipients in a class, Federal credit is ineffective. Federal credit is virtually costless to the Government when it is directed towards stable firms investing in stable projects, but, in this case, Government backing is worth almost nothing to the firm receiving the subsidy because credit is available to these firms without Government backing at about the same interest rate as if there were Government backing. But if this type of equity among recipients is unimportant or if assisting risky borrowers is an intended objective, Federal credit may be more appropriate than a direct subsidy. This logic is applicable to such programs as guaranteed student loans. The "riskier" students--insofar as they could have been identified in advance by lenders--received greater benefits through reduced interest costs.

A firm's evaluation of an investment's riskiness partly depends upon its relation to other investments the firm has made. Diversification tends to reduce overall riskiness. On the other hand, if the investment means greater concentration of the firm's assets in one market or industry, then

the firm is placed in a riskier situation. If this is the case, the implicit value of a loan guarantee is enhanced.

The larger the debt-service component of a given investment, the more effective loan guarantees will be in directing resources to that investment. In the case of investments with low debt-service components, the cost of providing Federal credit is low and the impact is low. Because debt-service payments are a small fraction of operating expenses, the result is a cost-effective subsidy with little impact.

Summary

The following factors make Federal credit programs particularly attractive, relative to other types of subsidy programs.

--Risky recipient.

--Risky project.

--No desire to spread subsidy evenly among potential recipients.

--The investment would result in greater concentration of the firm's assets and hence greater risk.

--Large debt-service component of the project.

TYPE OF FEDERAL CREDIT PROGRAM

Credit is extended by the Federal Government in several ways: a loan guaranteed by the Federal Government but financed through the private sector, a loan made directly by a Government agency, and a loan made by the Federal Financing Bank and financed through Treasury borrowing. Loans made by FFB can be loans that were authorized as either direct or guaranteed loans. However, FFB involvement makes them direct loans. 1/

One economic difference between direct and guaranteed loans is that the Government sets the interest rates on direct loans,

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1/"Government Agency Transactions with the Federal Financing Bank Should Be Included on the Budget," GAO report (PAD-77-70), Aug. 3, 1977.

but on guaranteed loans the interest rate is market determined. 1/ Thus, on direct loans, the Government can adjust the interest rate to give more or less subsidy to the recipients--an adjustment that cannot be made as easily with loan guarantees. The problem with adjusting the subsidy level through the interest rate charged on a direct loan is that the level of subsidy depends on the difference between the Government-set interest rate and the interest rate the buyer would pay in the private market; this difference is difficult to monitor. On the other hand, a fee can be charged on a loan guarantee that accomplishes the same purpose of adjusting the level of subsidy. In addition, the loan guarantee could be coupled with a direct subsidy such as Federal Housing Authority section 235, Homeownership Assistance Program, if additional subsidy is required.

Another difference between these types of credit assistance comes from the supply side of the financial market--the nature of the institution making the loan. A guaranteed loan typically bears a higher interest rate than a comparable direct loan. To understand this difference, compare the interest rate on a guaranteed loan with that on a direct loan made to the same firm for the same purpose at the same cost to the Government. 2/ Suppose that the direct loan is made at Treasury's borrowing rate. That is, the Government lends at its borrowing cost. Then the net cost to Government of the direct loan is its default losses. The comparable guaranteed loan--the one whose cost to the Government also equals default losses--is made by a lending institution at an interest rate which covers the institution's borrowing costs as well as a return on the equity of the owners of the institution. This interest rate is higher than the Treasury rate on the direct loan. Thus, for the same cost to the Federal Government, the direct loan will have a lower interest rate and, thus, more value to the firm than the guaranteed loan.

Because loan guarantees are funneled through the lending institution, they can be used to test a financial

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1/If an interest-rate ceiling is imposed on a loan guarantee, it is largely ineffective; lenders develop mechanisms such as "points" to bring the effective rate up to the market.

2/This analysis assumes that the administrative costs of the direct and guaranteed loan are equal--an issue that will be discussed in more detail later.

innovation's feasiblity. For example, the early housing loan guarantees demonstrated the feasibility of amortizing mortgages over a long period. Once lending institutions had experience with this type of mortgage, the institutions developed confidence to make long-term mortgages without guarantees. When the financial innovation is understood by lending institutions and has been proven successful, guarantees may be removed.

Another factor (which leads to an apparent rather than a real distinction between direct and guaranteed loans) is their different budget treatments. Government agencies prefer guaranteed loans because guarantees do not count against the agency budget ceiling--the only measure of the cost of future defaults which may appear in the budget would be amounts provided (through appropriations or borrowing authority) as a reserve for losses. Most direct loans do appear on the budget when disbursed. This budgetary treatment of direct loans does not provide a good measure of the cost of these outlays either. In this case, the cost is overstated because the loans are treated as expenses and no measure of the value of future repayments appears in the budget. To reveal most accurately the cost of credit programs, it would be preferable to show only expected losses in the budget in both cases, but this would be difficult to reconcile with the budget's cash-flow orientation as a whole.

The availability of FFB financing complicates budget treatment. Guaranteed loans financed through FFB do not appear on agency budgets, even though they have actually been converted to direct loans. But some direct FFB loans do appear on agency budgets, such as those of the Export-Import Bank and Tennessee Valley Authority. As a result, budget treatment of Federal credit is inconsistent and does not reflect the full-resource implications of the loans. GAO has recommended that the Congress require that FFB's receipts and disbursements be included in the Federal budget totals. 1/

A problem with direct loans and FFB loans is that interest rates are not market determined. The danger of not subjecting the interest to market forces is that the Government may grant an unintended subsidy by setting interest rates too low or the

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1/For a discussion of this and other budget issues related to credit programs, see "Government Agency Transactions with the Federal Financing Bank Should Be Included on the Budget," GAO report (PAD-77-70), Aug. 3, 1977.

program may not be used if interest rates are too high. Generally, direct loan interest rates are either set by legislation or tied to some other interest rate such as Treasury's. FFB loans are made at 1/8 percent above the yield on Treasury securities of similar maturity. Tying the interest rate on a loan to a market-determined rate, such as Treasury's indirectly ties the rate to the market and is preferable to setting an interest rate through legislation.

An advantage of using FFB is that because FFB obtains its funds from Treasury borrowing, it is able to finance a loan at a much lower cost than an agency could obtain in private markets. Without FFB, the borrower of a guaranteed loan frequently has to resort to the private placement market where costs are relatively high.

As it is currently structured, FFB does not service loans which means that each agency guaranteeing FFB loans must maintain a staff that functions as loan officers and examiners. Centralizing this function in some circumstances might improve the efficiency of Federal credit operations, but this objective should be balanced against the risk of losing program expertise in those cases where it is an important consideration.

GAO Guidelines

> Given consistent budget treatment of all Federal credit programs, the major economic difference between a direct and a guaranteed loan made to the same firm for the same purpose at the same cost to the Government is that the interest rate on a guaranteed loan is higher than on a direct loan. As a result, the direct loan is more valuable to the borrower. This substantial economic advantage of a direct loan must be weighed against the fact that the guaranteed loan interest rate is market determined but the direct loan interest rate is not. Guarantees may also be preferable to direct loans when one of the goals of the program is to demonstrate the feasibility of a financial innovation. The main advantage of using a financial intermediary such as FFB to finance borrowing is that the intermediary obtains funds more cheaply than the individual agency or guaranteed borrower could.

RISK EVALUATION

Fundamental to the evaluation of an existing or proposed Federal credit program is an assessment of the program's

riskiness. One basic decision that should be made at the program's outset is whether the program is intended to be self-supporting or whether the Government intends to include an additional subsidy in the form of losses on defaults.

If a loan guarantee program is to be self-supporting, a loan guarantee fee should be set high enough to cover expected losses to the Government. The fee can be developed by basing it on the firm's financial soundness and its projects. On the other hand, the Government can provide an additional subsidy to the firm by setting the guarantee fee at a level that is too low to cover the expected losses or by charging no fee at all. In a direct loan program, the subsidy amount can be adjusted through the interest rate.

To explain the use of the guarantee fee, consider the analogy of the purchase of insurance by an individual who buys insurance in order to avoid the risk of large losses. If the insurance company is large and well-diversified, any single loss is covered by premium receipts. The purchase of insurance is of value to both parties. The loan guarantee can be viewed as loss insurance sold by the Government, which can be set to cover losses from defaults. The Government can bear the risk of losses on an individual loan better than an individual borrower or lender.

It is important to recognize explicitly that in order to stimulate activity in certain sectors, the expected cost to the Government must be positive. That is, some projects may not be economically feasible if the borrower must pay a loan guarantee fee high enough to cover the Government's expected losses. In other cases, a direct subsidy may be necessary, in addition to credit assistance, to make a project economically viable. The decision then of whether the benefits of the activity stimulated by the loan guarantee are worth the Government's cost must be made by the policymaker. For example, the Small Business Administration (7a) loan program operates at a loss. 1/ If SBA charged a loan guarantee fee which covered expected losses, few viable small businesses would start. In this case, there is a cost to the Government of stimulating the activity. Whether the activity generated by SBA loans is worth the cost is a policy rather than an economic decision.

1/"The Small Business Administration Needs to Improve Its (7a) Loan Program," GAO report (GGD-76-24), Feb. 23, 1976.

The best information to analyze the level of risk of a given loan would be knowledge of the probability of default. Unfortunately, such information is not usually available. Longstanding programs that make many loans can be analyzed by relating defaults to recipients' characteristics. For example, financial statement information can be used in the case of SBA loans. Certain demographic characteristics could be used to analyze the level of risk of student loans, although care must be taken to choose valid characteristics, avoiding those which would be unfair or discriminatory or which would defeat the program's purpose. It is almost impossible to use statistical techniques to judge the riskiness of large one-time loans or of new loan programs, such as those for energy experiments. In these cases, individual analysis and judgment must be relied on.

The more risk the Government accepts in a given program, the larger the difference between the value to the firm and the cost to the Government, even though the cost increases with the acceptance of additional risk. That is, the advantage of loan guarantees over direct subsidies grows with increased risk because the individual recipient of a loan guarantee is more risk-averse than the Government. However, the Government will wish to limit the risk it undertakes because some levels of risk imply too costly a means of achieving the program's objectives.

GAO Guidelines

> It should be determined at the outset whether a program is to be self-supporting. If so, the loan guarantee fee or the direct loan interest rate should be set according to risk to cover the expected losses from default.

RISK CONTROL

In traditional, privately financed loan programs, the lender designs the program and carefully investigates the borrower order to insure against default. However, in a Government loan program, the private sector bears little risk and, as a result, has little incentive to guard against default. When the Government assumes most of the risk, it must also assume responsibility for choosing applicants and for judging the acceptability of the risk.

Several mechanisms are available to control risk. The first is to subject the loan recipient to certain operating restrictions. For firms receiving loan guarantees, these

could include limiting dividends and additional investments, requiring purchase of insurance, or requiring operation within certain constraints on financial statement data.

For example, recipients of ship construction loan guarantees are originally classified as weak or strong firms. The classification is based primarily on the working capital and the ratio of long-term debt to equity of the owner or of the bareboat charterer 1/ in the case of a leveraged lease. Usually throughout the life of the guaranteed loan, the Maritime Administration (MarAd) restricts the activities of the borrower through covenants determined by the initial assessment of the applicant. Certain covenants are in force as long as the basic financial requirements are met. Otherwise, more restrictive covenants apply. MarAd reassesses the risk of each loan guarantee each year and sets the guarantee fee based on this risk. In this program, the risk is assessed by a single measure--the ratio of long-term debt to equity.

As illustrated in the discussion of the Z Corporation (see p. 16) and supported by the fact that the revolving fund for these ship construction loans is growing, the guarantee fee more than covers the Government's cost. As a result, as long as the current priority system for selecting recipients of loan guarantees continues, the current risk-assessment procedures will work. However, if it were desirable to support more ship-building activities, the Government could, for example, concentrate on supporting more cargo-carrying vessels by guaranteeing loans to riskier projects or increasing the total amount loaned to all eligible vessels.

If risk were increased in one of these ways, risk-assessment procedures would have to be revised to provide an adequate measure of market value and account for variations in risk that result from size and diversification, including whether the loan is of the partial-recourse variety. (The ratio of long-term debt to equity, which has been used in some programs, is a poor measure of risk because book value of equity for an established firm does not measure market value accurately.)

One way to improve risk-assessment is to rely more on the statistical analysis of financial measures, like some recently developed credit-scoring models used by some large

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1/A bareboat charterer leases a ship and bears all the risks and responsibilities of ownership, but pays a fixed amount to the owner for using the vessel.

banks to make loans. Variations on the use of covenants could be used in other programs. For example, for cities receiving loan guarantees, the covenants could include restrictions on the types and costs of services the cities provide. In this case, however, consideration would also have to be given to the effects of such restrictions on the traditional pattern of Federal, State, and local relations.

The second mechanism for controlling risk is through recourse to the borrower's assets in the event of default. Full-course loans are those for which the Government can recover the full value of the loan guarantee (except in the case of bankruptcy) from the defaulting recipient. In the partial-recourse loan, the recourse is usually to the asset for which the loan was made.

Limitations on recourse increase the loan's value to the recipient. The cost to the Government also increases, but not as much. These provisions also increase default risk. Partial-recourse loans could be particularly effective when the Government wishes to encourage investment in a new and uncertain technology but the firm does not wish to gamble its other assets on the venture. One possible approach might be for the Government to sell the partial-recourse provision at a fee that covers expected losses to the Government.

There are two ways to set up the partial-recourse feature. The most straightforward way is to write it into the loan agreement. The other way is for the recipient of the loan guarantee to set up a subsidiary whose only assets are those financed by the loan guarantee.

How large a fraction of the asset should the loan be for? If the market will lend only 80 percent, but the Government program will lend 95 percent, the subsidy may well show up as a loss to the Government later on. If the value of the asset drops by more than 5 percent, then the borrower may find that default is a perfectly rational course of action, especially if the Government has no recourse to the borrower's other assets.

Another way to control risk is to require coinsurance by the lender. This provides some incentive to lenders to fulfill the responsibility of qualifying the risks and servicing loans. This provision is useful in case the agency guaranteeing loans cannot qualify risk and service loans in-house. The experience with the SBA (7a) loan program in which lenders were required to coinsure 10 percent of the loan value and qualify risk casts doubt that a small coinsurance requirement

is useful. 1/ In the SBA case, lending institutions badly abused the program by giving loans to very risky ventures. On the other hand, guarantees requiring a large amount of coinsurance may be self-defeating because not enough risk is taken over from the lending institution to reduce borrowing costs significantly.

Coinsurance, in which a private lender bears some portion of the risk, can help in gaining private sector involvement in this responsibility. But the diligence with which a coinsurer carries out this responsibility will be largely dependent on the amount of real risk to which he is exposed. It must be recognized that the appearance of coinsurance does not necessarily produce results. In the GI home loan guarantee program, for example, the Veterans Administration officially guarantees only the top (60 percent or $17,500) of the loan. In fact, however, losses exceeding this amount are quite rare, so there is little risk to the private sector coinsurer on these loans.

The final method for limiting risk would be to provide for maturities that are shorter than the estimated useful economic life of the assets financed. Such a provision tends to assure a continued incentive for borrower loan repayment and maintenance of the asset. However, this provision also places a large debt service burden of repayment on the borrower. For some projects, the borrower may be able to manage such a burden; and in other cases, the initial cash flow to the firm from the project may be too small for the firm to manage large debt service payments. As a result, this type of provision must be applied carefully.

In structuring repayments on a given loan, some thought should be given to the pattern of cash flows from a project. For example, if initial cash flows are expected to be small, loan repayments might be phased in gradually. This procedure might keep a project that would go under with standard loan repayment terms during its initial phase financially sound. For some projects, such as experiments in energy production, a project's monetary outcome is uncertain. For these projects, the agency might consider guaranteeing only part of the cost to encourage cost consciousness. Expenditures would be guaranteed only up to a certain level. The firm would

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1/"The Small Business Administration Needs to Improve Its 7(a) Loan Program," GAO report (GGD-76-24), Feb. 23, 1976.

then have a strong incentive to avoid cost overruns, but would still be protected against total loss due to possible technological failure or lack of demand for the product. The risk of repayment of the remainder could be borne by the commercial lender.

GAO Guideline

The mechanisms to control risk that should be considered include:

--Restricting the borrower's operation.

--Adjusting the U.S. Government's recourse to the recipient's assets.

--Requiring some coinsurance by the lender.

--Adjusting the maturity length of the loan and the repayment plan.

ADMINISTRATIVE AUTHORITY FOR FEDERAL CREDIT

Once a loan program has been designed, who should administer it? As a general rule, the agency that bears the financial responsibility for the program should take responsibility for risk evaluation and monitoring. When a commercial lending institution makes a loan, it has financial incentives to investigate the recipient carefully and monitor the loan closely. But when the Government backs a guaranteed loan, the financial incentive to the lending institution for monitoring and investigation disappears. Therefore, the Government should take responsibility for these functions.

The SBA 7(a) loan program provides an example of what happens when the Government bears the risk of a loan program, but depends on banks for the risk analysis. 1/ Loans have been made for questionable purposes, such as transferring risky loans held by a bank to SBA. The banks did not, in other cases, analyze the prospective borrowers' financial condition adequately or verify the adequacy of collateral pledged.

1/"The Small Business Administration Needs to Improve its 7(a) Loan Program," GAO report (GGD-76-24), Feb. 23, 1976.

The agency responsible for administration should be determined in advance, and it should be given incentives to carry out the program in a manner consistent with the intent of the Congress. Some thought should be given to who will assess each loan's feasibility, how much flexibility will be given to the agency to set loan terms, and who will coordinate the entire program.

The handling of these responsibilities depends on the nature of the program. For example, for loan programs of a continuing nature, setting up a loan office in the agency may be efficient. One example of this arrangement is MarAd's Office of Ship Financing which has about 10 full-time loan examiners who are conversant with the institutional aspects of financing ships with loan guarantees. On the other hand, if only a few loans will be processed by an agency, it may be more efficient to contract out the loan evaluation function to someone with loan officer experience and whose loyalties would be to the agency rather than to the lending institution or the loan recipient. The Department of Energy anticipates making a small number of loan guarantees to firms to experiment with alternative energy production technologies. These loans, because they are not expected to be a continuing function of Energy, may be good candidates for evaluations by a contractor. 1/

Another possibility is to centralize the administration of Federal credit programs in a new agency. The processing agency would have to work closely with the agency guaranteeing the loans to make sure that evaluation and monitoring of loans is done in a manner consistent with the program's goals. However, duplication among agencies in maintaining loan processing expertise would be eliminated.

For a guaranteed loan, the consequence of putting the risk analysis and monitoring function in the hands of the agency rather than the lending institution is that the lending institution serves little useful purpose. In addition, as discussed earlier (see p. 26), the guaranteed loan is a less efficient form of subsidy than a direct loan. The result is that direct loans are a preferable form of credit assistance. Guaranteed loans merely direct business to the lending institution at the borrower's expense.

1/Morrison, Richard, "A Comparative Study of Selected Federal Government Guarantee Programs," Office of Commercialization, Energy Research and Development Administration, Dec. 1976.

GAO Guideline

In general, the agency that bears responsibility for a program should be responsible for risk analysis and risk monitoring. In cases where it is impractical or inefficient to undertake these jobs in-house, the agency can either contract out these functions or a central government loan facility could be set up for these agencies.

In general, direct loans are preferable to guaranteed loans from an economic viewpoint because the lending institution performs essentially the same function as the Government agency, but at a higher cost to the borrower.

ADMINISTRATIVE GUIDELINES

The obligational authority made available in advance to the agency should be adequate to provide the reserves necessary to carry out the planned level of guarantees. The budget should be subject to full disclosure and to executive and congressional review. One method for systematically disclosing the relationship of revenues, expenses, and subsidy provided by the Government in such programs is to establish a revolving fund for each program. All receipts and all payments, including loan repayments and reimbursement for administrative expenses, would be handled by the fund. The fund would be established with a capital appropriation and would be interest-bearing. It is important, however, to assure that the revolving fund is subject to effective scrutiny and control. 1/

Provision in the legislative authority should also be made for allocating credit when the demand for guarantees exceeds the available authority. From the standpoint of program effectiveness, an essential criterion is obviously compatibility with long-run objectives of the program. Alternative bases for choosing borrowers include need, risk, first-come-first-served, random, or a market mechanism.

For example, the statutory rationale for the maritime loan guarantees is, in part, maintenance of an emergency

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1/"Revolving Funds: Full Disclosure Needed for Better Congressional Control," GAO report (PAD-77-25), Aug. 30, 1977.

fleet. If loans are made according to a criterion of minimizing losses, then some loans would go to relatively safe projects, such as river barges and oil-drilling rigs, rather than to financially riskier projects more clearly related to emergency needs.

The market mechanism of credit allocation often provides appropriate and efficient incentives and should receive careful consideration. By the market mechanism, we mean allowing the price for the guarantee to be established in a "market for guarantees," thus linking the cost of the guarantees to their value to the recipient. For example, guarantees could be granted based on competitive bidding on certain features, such as equity participation by the firm, the guarantee fee, the amount of the assets pledged as collateral in case of default, or the portion of the loan that is guaranteed. By making prospective borrowers compete for terms, the Government can reduce its expected cost and risk. Furthermore, by increasing the equity participation of the firm and by leaving part of the loan uninsured, it can give both the borrower and the lender a greater incentive to manage the venture efficiently so as to avoid default. Such competition would result in a higher equity-to-debt ratio for the borrower, which reduces risks to the Government. Another advantage of the market mechanism is that it forces the private sector potential recipients of credit to evaluate the project's risk and, as a result, eliminates the risk-assessment burden from the Government. However, this mechanism will best serve those recipients who need Government backing least; that is, the winner of such an auction will tend to be financially sound and able to incorporate some risk.

Finally, if possible, some mechanism could be built into guarantee programs to encourage investment during recessionary periods when economic stimulus is needed. This provision would help avoid conflict between program goals and the macroeconomic goals of stabilization.

GAO Guideline

The administrative practices that should be considered during a program's formative stages include:

--Obligational authority.

--Disbursement procedures.

--Allocation of credit when demand exceeds the available authority.

--Encouragement of investment during recessionary periods.

APPENDIX I

LENDER RISK REDUCTION

Federal credit programs shift risk from a commercial lender to the Government. This shift results in lower interest rates to the borrower. In addition, the riskier the firm or the project, the greater the interest-rate reduction.

Analysis

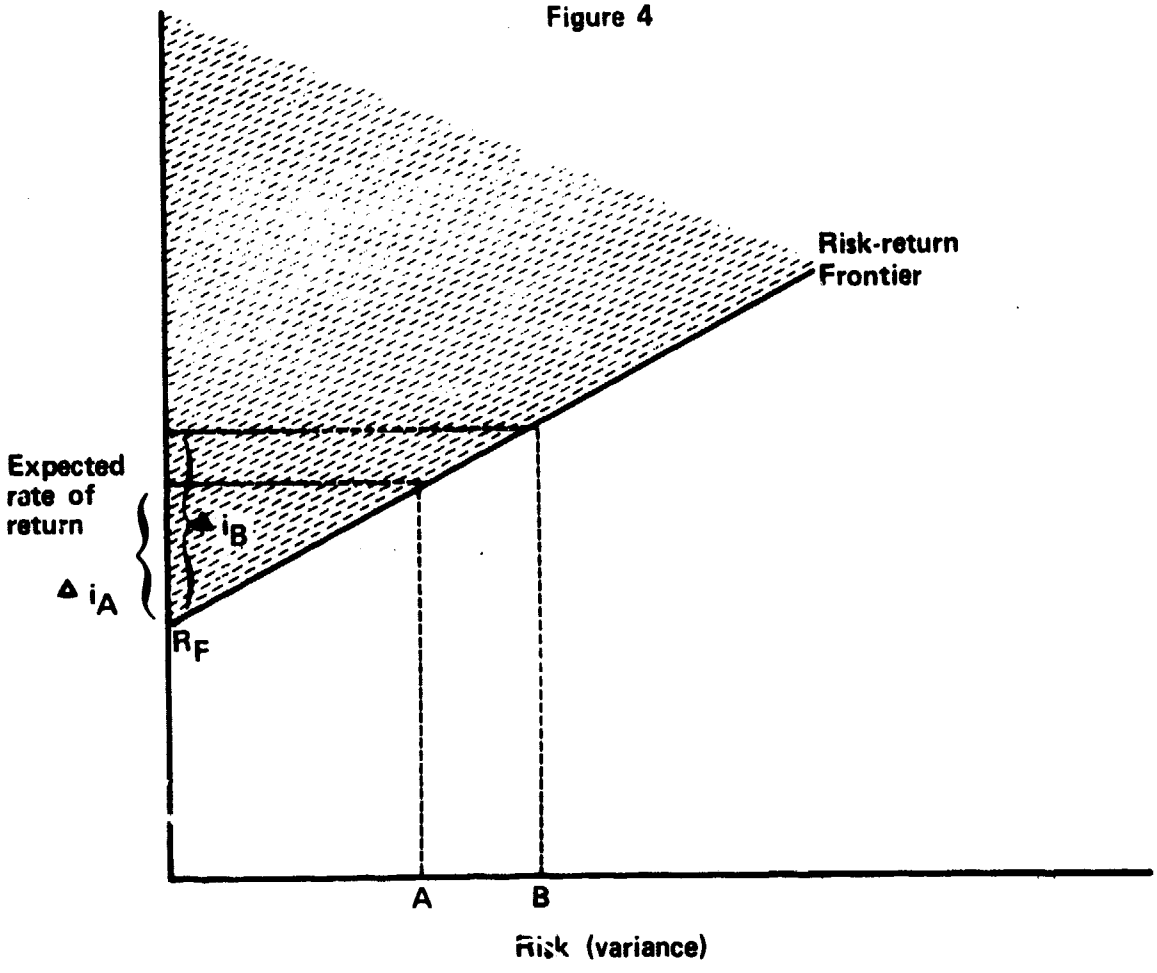
The reason for the risk-reduction effect is illustrated in figure 4. The commercial lender varies interest rates charged according to the perceived risk involved in a loan. For example, in figure 4, combinations of risk and return that are above the risk-return frontier are acceptable to the borrower. The level of risk is measured by the variance of the potential returns. In a competitive market with perfect information, borrowers will not accept loans above the risk-return frontier. GAO has estimated that in the market for bonds each additional unit of variance in the returns results in a .015 increase in the required return to the lender measured in percentage points. That is, the slope of risk-return frontier is .015.

The value to the firm of borrower risk reduction is reflected by the change in interest rates that the firm pays. For example, a 100-percent guaranteed loan would induce the borrower to charge a risk-free interest rate, R_f, in figure 4. If the risk of the project is at point A in figure 4, then the interest rate saving is Δi_A. The amount Δi_A consists of two parts--the change in expected returns because there is no longer any possibility of default and a value for the reduction in the variation in possible returns because the lower returns have been deleted. The cost to the Government of guaranteeing consists only of the first part.

We illustrate our point with an example. Suppose a lending institution is considering a 1-year loan on an investment with stated return r percent, but the probability that the firm making the loan will default the whole value of the loan is p. Assume that there is no possibility of partial default. Then at the end of the year, the possible outcomes of this loan are:

APPENDIX I

Figure 4



Lender Risk Reduction

Risk-Return combinations
that are acceptable to
borrowers are in shaded region

APPENDIX I

Return (percent)	Probability
0	p
100 + r	1-p

It can be shown that this loan has an expected return of $(100 + r)(1-p)$ and variance of $(100 + r)^2 p(1-p)$. The guaranteed loan has a return of $100 + R_f$ with certainty where R_f is the risk-free rate of return. The value of the change in variance to the lender is $.015(100 + r)^2 p(1-p)$, and the change in expected return is $100 + R_f - (100 + r)(1-p)$. On the other hand, after guaranteeing the loan the possible outcomes for the Government are:

Return (percent)	Probability
$-(100 + R_f)$	p
0	1-p

Assuming that variance of the returns to the Government does not have a negative value to the Government, the only cost to the Government is the expected losses on defaults $-(100 + R_f)p$.

The effect on the borrower of the lower interest rates achieved through lender risk-reduction is to decrease the borrower's interest payments and increase his expected cash flow on a project. In this case, the riskier the project and the firm, the greater the interest-rate reduction. For example, in figure 4, the interest-rate reduction on a loan with risk B greater than A is Δi_B, which is greater than Δi_A. That is, risky firms and projects receive larger interest subsidies than stable firms and projects. The benefit to the firm of reduced interest rates is almost always higher than the expected cost to the Government of guaranteeing the loans.

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