

THE ALLOCATIONAL AND WELFARE EFFECTS OF FEDERAL CREDIT PROGRAMS:

A SUMMARY

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Abstract

Federal credit activity is large, diverse, and pervasive. The purpose of this research is to develop a framework for the analysis of the allocational and welfare effects of credit policy. Theoretical analysis and numerical simulation provide the basis for a variety of policy implications. Although there is a potentially useful role for federal credit, current subsidies and budgetary practices are seriously misguided.

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The Allocational and Welfare Effects of Federal Credit Programs:

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I. Introduction

Extensive federal lending activity is a generally unrecognized feature of modern credit markets. Since 1980, the government has subsidized, guaranteed, or extended \$1,129 billion of net credit.^{1/} By comparison, over the same period, federal borrowing from the public was \$1,101 billion. In 1986, subsidized credit accounted for 42% of all non-federal borrowing.

The government supplies or reallocates credit through the provision of direct loans, loan guarantees, interest subsidies, tax-exempt status, and a variety of Government-Sponsored Enterprises and quasi-public organizations. Summary data are presented in Table 1. The figures indicate a sizable and sustained federal presence as a lender. Although tax-exempt financing accounts for a large share of the recent increase in federal credit, direct and guaranteed lending continue to play important roles in certain sectors.

Credit programs assist virtually every sector of the economy in an extensive array of programs. Hardin and Denzau [1981] report the existence of more than 350 credit programs. Principal ongoing lending policies assist borrowers in the housing, farm, student, small business, and state and local government sectors.^{2/}

In recent years, credit programs have been employed (with varying degrees of success) to attain a variety of policy goals, including the

Table 1

Federal Lending and Domestic Credit Markets

(Dollar Amounts in Billions)

| Fiscal Year | 1975 | 1980 | 1983 | 1986 |
|---|-------|-------|-------|-------|
| (1) Net Credit Advanced in Non-Financial Credit Markets | 178.0 | 354.5 | 512.6 | 889.1 |
| (2) Net Federal Lending | 38.4 | 109.9 | 146.7 | 272.9 |
| Direct Loans | 12.8 | 24.2 | 15.3 | 11.2 |
| Loan Guarantees | 8.6 | 31.6 | 34.1 | 34.6 |
| GSE | 5.6 | 24.1 | 37.1 | 83.3 |
| Tax-Exempt Financing | 11.4 | 30.0 | 60.2 | 143.8 |
| (3) Federal Borrowing from the Public | 50.9 | 70.5 | 212.3 | 236.3 |
| (4) Federal Lending as a Percentage of Net Credit | 22 | 31 | 29 | 31 |
| (5) Federal Lending as a Percentage of Non- Federal Borrowing | 30 | 39 | 49 | 42 |

Sources: Special Analysis F, Special Analyses: Budget of the United States Government, various years; Flow of Funds Accounts, various years.

redistribution of wealth, correction of a capital market imperfection, or promotion of competition. Because lending has proven to be such a flexible policy tool, subsidies are often proposed as solutions to sectoral or national problems, such as energy development and industrial policy. In addition, federal budgetary analysis creates a bias in favor of credit interventions by not recording their costs properly.

Despite the potential importance of federal credit activity, there exists little systematic analysis of and even less agreement on the effects and appropriate role of the government as a lender.^{3/} Therefore, the purpose of the research summarized here is to develop and apply a framework that addresses the allocational and welfare effects of federal credit programs.

Principal conclusions are as follows. The effects of credit subsidies depend on the size of the subsidy and the elasticities of supply and demand. Notably, credit volume is not important in determining the net effects. Lending programs exert important effects in the markets for student, agricultural, small business, and tax-exempt credit. Although the largest programs target the housing sector, their effects appear to be relatively small due to the small subsidy they provide. Interactions among credit programs can serve to offset some or all of the direct benefits.

Most of the direct welfare gains of credit subsidies accrue to borrowers who would have received funds without public assistance. Current programs for groups that would have been excluded from private markets, such as students and small businesses, have proven very costly. Therefore, they require the existence of large external gains to be welfare-improving.

The most important policy imperative is improvement of budgetary and administrative procedures. Budgetary analysis should focus on the present

value of the costs of current credit policy actions, rather than on credit volume, as is currently the case. Although resale of loan assets and reinsurance of loan guarantees are potential models for budgetary practice in the long run, liquidation of the government's loan portfolio under current conditions is likely to raise the cost of credit programs.

Programs with conflicting goals should be separated into two or more programs, each with its own objective. Decoupling would serve several objectives. It would clarify the purpose, and therefore define criteria for success or failure, for existing programs. In addition, decoupling would serve to emphasize that subsidizing credit is usually a costly and ill-suited way to redistribute income or to encourage a preferred activity.

Government has attempted to resolve myriad social problems through the use of credit subsidies. The proper role of public credit, however, is more limited. Specifically, credit policy should focus on improving the organization and operation of credit markets, by reducing administrative costs, pooling risks, or reducing incentives to default. Although there is a useful role for the government in this regard, current policies are seriously misguided.

Section II describes the underlying model. Sections III and IV analyze the allocational and welfare effects of credit subsidies. Section V provides a more detailed discussion of the policy implications listed above.

II. A Model of the Credit Market

The underlying framework for the analysis is derived from the modern credit market literature. Informational constraints generate the possibility of equilibria characterized by market clearing, "redlining" (the complete exclusion of one or more identifiable groups), or rationing.^{4/}

Thus, credit policies may be examined in each regime. The model examines lending policies in the context of the credit market as a whole, fully integrates the government's costs, and allows for both the diversity of credit instruments and the simultaneous enactment of several policies.

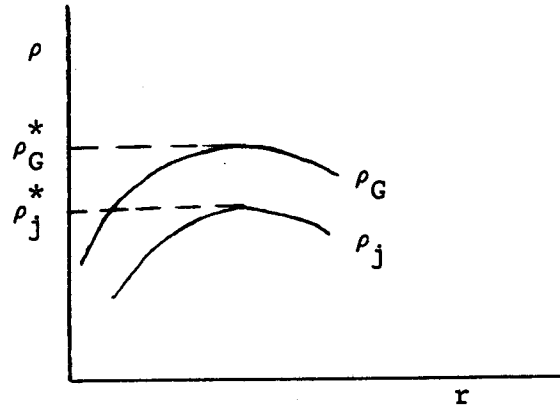
The credit market is assumed to consist of government and many borrowers, banks, and depositors. All agents are risk-neutral. There is no aggregate risk. Depositors supply funds (S) as a function of the rate of return on bank deposits (ρ), where $S(\rho)$ is assumed to be positive and nondecreasing.^{5/} Banking is subject to free entry and constant returns to scale.

Borrowers may be divided into $N+1$ groups: N target groups for credit policy and one general group.^{6/} The borrower groups are observationally distinguishable by banks. However, within each group, individual borrowers know more about their own riskiness than banks do. Therefore, because of adverse selection, there is the possibility, but not the necessity, that equilibrium will be characterized by rationing (see Stiglitz and Weiss [1981], for example). The expected return to the bank of lending to borrower group j at interest rate r_j is given by $\rho_j(r_j)$, and is depicted in Figure 1. I assume that the maximum bank return on general loans is greater than that available on target loans: $\rho_G^* > \rho_j^*$, $j=1, \dots, N$. This assumption is necessary and sufficient to imply that situations exist in which the general market clears, while target groups are rationed or redlined.^{7/} Borrowers apply for loans of fixed size.

The government borrows to fund its credit programs, and pays back depositors with program revenues first and general revenues thereafter. This assumption forces explicit recognition of the costs of the programs. The government has the same information and borrowing costs as banks.

Figure 1

Expected Bank Return on Loans to Various Borrower Groups



Equilibrium is characterized by equalization of banks' rate of return across all loans and deposits (a zero profit condition), and the equalization of supply of funds with the sum of effective borrower demand and government demand (no idle funds). Effective borrower demand refers to demand by groups to whom banks are willing to lend, given the cost of funds. For example, in Figure 1, if the equilibrium cost of funds is greater than ρ_j^* , banks will not consider making loans to group j, since such loans would generate negative expected profits. Aggregate effective demand is shown in Figure 2. The equilibrium conditions are summarized in equations (1) and (2) below:

$$(1) \quad \rho = \rho_i(r_i) \quad \text{for all } i \text{ with } L_i > 0,$$

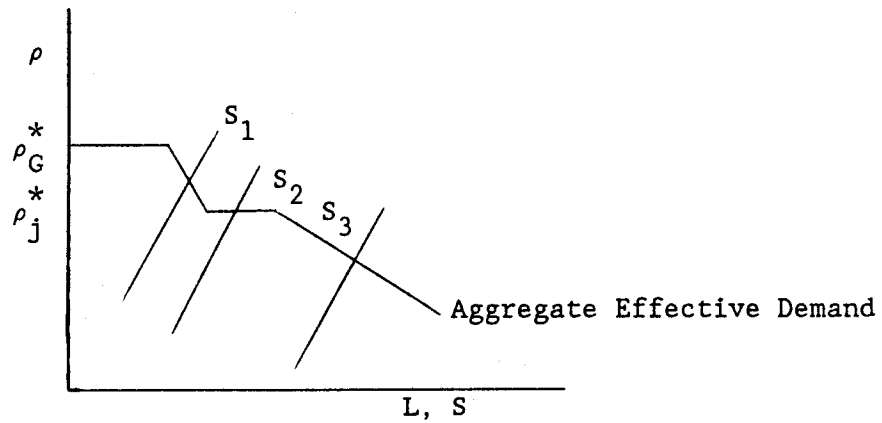
$$(2) \quad S(\rho) = \sum_i (L_i(r_i, C_i) + G_i(r_i, C_i)),$$

where L_i is the effective demand for group i, C_i (which may be a vector) represents credit policy for group i, and G_i is government borrowing to fund credit programs for group i.

In equilibrium, banks order borrower groups by their maximum rate of return and serve them sequentially. If the equilibrium rate of return is ρ^* , then all groups j with $\rho_j^* > \rho^*$ have clearing credit markets, all those with $\rho_j^* = \rho^*$ are rationed^{8/}, and all those with $\rho_j^* < \rho^*$ are redlined. As shown in Figure 2, in equilibrium the market for target group loans may clear (S_3), be rationed (S_2), or be redlined (S_1).

Target groups are the residual groups in the market. Therefore, because banks serve borrower groups sequentially, the marginal effects of changes in the supply or demand for funds are felt disproportionately by the target groups. For example, in the rationing equilibrium, a small reduction in the supply of funds is matched by an equivalent drop in target group

Figure 2
Types of Equilibria



borrowing; general borrowing is left unaffected, and interest rates do not change.

The specification of federal lending policies is potentially very complex, due to the extremely large number and diversity of credit programs. Lending policies are modelled here by several key parameters: a direct loan program is defined by loan volume and the subsidy (government cost) per loan; guaranteed loans are characterized by their guarantee rate, fee, who pays the fee, and the subsidy inherent in other features of the guarantee (such as, for student loans, the deferment of principal and interest payments until graduation).^{9/}

III. The Allocation of Credit

The analysis distinguishes between self-financing credit programs and all others. A program is self-financing if the expected receipts collected through the program are sufficient to pay the expected costs. Self-financing direct loan programs are shown to be neutral with respect to credit allocation and interest rates. The provision of public funds is simply offset by reduced private supply to the target group. If banks pay the fees, self-financing loan guarantees are also neutral. The programs act as break-even insurance contracts, which do not affect the behavior of risk-neutral banks. However, if borrowers pay the fees, self-financing loan guarantees crowd in target group investment and crowd out non-targeted investment.

Under very general conditions, all other subsidies and guarantees crowd in investment by targeted groups and crowd out investment by others. The extent of credit reallocation depends positively on the magnitude of the

effective subsidy, the elasticity of the supply of funds, and the elasticity of target group demand. Reallocation depends negatively on the responsiveness of demand by unsubsidized sectors.

Numerical simulations indicate that these effects can be important. The simulations model the effects of five major types of credit programs: mortgage guarantees, subsidized farm lending, guaranteed small business loans, guaranteed student loans and tax-exempt financing.^{10/} In 1986, these instrument-sector combinations accounted for 75% of all new direct loan obligations and 90% of all new guaranteed loan commitments. The subsidies in these programs accounted for approximately 75% of all subsidies extended through loan guarantees and 50% of all subsidies extended through direct loans other than military sales credit.^{11/} Credit allocations were based on Flow of Funds data; supply and demand elasticities were taken from the existing empirical literature; default rates were estimated by a variety of means.^{12/}

Aggregate credit market figures, with and without lending policies, are given in Table 2.^{13/} The table is based on the assumption that all markets clear with existing credit programs, and that farmers would be rationed, and students and small businesses redlined, without credit programs.^{14/}

The simulation results indicate that credit programs, in aggregate, raise interest rates by about 1.2 percentage points. The crowding out of general (non-targeted) borrowers is estimated at \$6 billion, or approximately 1% of their net investment. The sectoral effects of credit policies vary significantly. Central estimates indicate that lending programs raise mortgage credit by approximately 1%, farm credit by approximately 90%, and state and local government borrowing by 17%.^{15/} Investment by all subsidized groups rises by 12%. Excluding the mortgage market, investment in subsidized sectors rises 34%. Overall, investment

Table 2

Basic Simulation Results

| Sector | Case* | Funds Received or Supplied | Interest Rate | Q** | Direct Surplus*** |
|--|-------|-------------------------------|------------------|-----|----------------------|
| Housing | (a) | 100.0 | .100 | .01 | 33.4 |
| | (b) | 98.9 | .099 | 0 | 32.5 |
| Farm | (a) | 10.0 | .158 | .25 | 4.2 |
| | (b) | 5.2 | .145 | 0 | 1.7 |
| Student | (a) | 3.0 | .100 | .42 | 1.5 |
| | (b) | 0 | - | 0 | 0 |
| Small Business | (a) | 1.0 | .134 | .12 | 0.4 |
| | (b) | 0 | - | 0 | 0 |
| Tax-Exempt | (a) | 50.0 | .100 | .19 | 24.5 |
| | (b) | 42.6 | .088 | 0 | 15.4 |
| Total, Target Borrowers | (a) | 164.0 | - | - | 64.0 |
| | (b) | 146.7 | - | - | 49.6 |
| General Borrowers | (a) | 682.6 | .100 | - | 240.3 |
| | (b) | 688.9 | .088 | - | 247.7 |
| Total Investment | (a) | 847.6 | - | - | 304.3 |
| | (b) | 835.6 | - | - | 297.3 |
| Govt Borrowing for Credit Programs | (a) | 17.4 | .10 | - | -19.1 |
| | (b) | 0 | - | - | 0 |
| Suppliers | (a) | 864.0 | .100 | - | 237.6 |
| | (b) | 835.6 | .088 | - | 228.3 |
| Total | (a) | - | - | - | 522.8 |
| | (b) | - | - | - | 525.5 |

*Cases: (a) Existing credit policies; all markets clear. (b) No credit subsidies; farmers are rationed; students and small businesses are redlined.

**Q represents the percentage reduction in the present discounted value of loan payments attributable to the credit program.

***Direct surplus is the standard measure of producer's or consumer's surplus. External effects are excluded.

risers by approximately 1% in response to credit policies.

A credit program that subsidizes one group will necessarily raise interest rates for other borrowers. Therefore, the direct benefits of any credit program are offset at least partially by the existence of other programs. Consequently, to some extent, government programs compete against each other in the allocation of credit. This is especially important because the target groups are the residual claimants to funds. Thus, the government may be simply rearranging credit among target groups.^{16/} For most programs, the offset induced by other credit activity is small. However, for housing programs, approximately 50% of the original benefit is offset by other credit policies, because the direct subsidy in housing is very small.

Furthermore, if any group is rationed in equilibrium, other federal credit policies reduce its credit allocation substantially. Since banks serve borrower groups sequentially, any rationed group is serviced last among groups that do receive funds. A subsidy that shifts the status of a group from redlined to market clearing moves the subsidized group ahead of the rationed group in order of service. Under these circumstances, the allocation of funds to the rationed group is diminished by a large percentage. Therefore, in the presence of rationing, the inadvertent effect of credit policies on other sectors can be severe.

IV. Welfare Analysis

Credit subsidies can raise welfare if they encourage investment in projects with higher than average social returns or positive externalities, and if welfare is defined in a utilitarian framework.^{17/} Notably, because

the programs serve primarily to redistribute resources rather than to increase the overall level of wealth, credit subsidies are rarely Pareto-improving.^{18/} Although it is extremely difficult to account for all the factors that enter social welfare, several interesting and useful welfare results emerge.

First, with the notable exception of mortgage programs, credit policy is successful in raising the consumer surplus of targeted groups. However, most of the gains accrue to borrowers who would have received funds without public assistance. For these borrowers, the subsidy is a pure windfall gain, and does not affect their investment behavior. For tax-exempt borrowers and farm credit programs, approximately 90% of the welfare gains accrue to inframarginal borrowers, for housing programs nearly 100%. In the absence of external effects, credit policies reduce the welfare of non-targeted borrowers and of non-borrowers as a group.

If both the financial costs of the programs and the resource cost of raising revenue in a distortionary manner are considered (see Ballard, Shoven, and Whalley [1984]), the programs generally need to produce external benefits on the order of 50-100% as large as the change in target group investment to raise welfare. It is possible that the programs, collectively or individually, satisfy this condition. However, in the absence of convincing evidence that such benefits exist, these estimates serve primarily to emphasize the direct losses in consumers' and producers' surplus.

Finally, imperfect or missing credit markets offer the government an opportunity to intervene and possibly raise welfare. However, the simulations suggest that, even if students or small businesses would be excluded from credit markets without public assistance, current programs for those groups do not necessarily raise overall welfare. Programs that

promote the efficient operation of credit markets are more likely to generate direct welfare gains. One such example is the Preferred Lenders' Program run by the Small Business Administration, which is discussed further below.

V. Policy Implications

The Effects of Program Reform

The largest federal credit programs target the housing and mortgage markets. However, the programs contain very small subsidies. Consequently, the elimination or other proposed modifications of these programs would have very small effects.

The cost of farm subsidies has increased rapidly in recent years. Halving the effective subsidy rate on farm loans reduces government costs by approximately 60% and reduces farm credit by 17%.

Student loan programs have been criticized for their high default rates. However, the principal costs and benefits of the program reside in the stipulation that principal and interest payments may be deferred until graduation. Eliminating this provision would raise students' borrowing costs by 86%. Conversion of the program to fair insurance would raise students' costs by an even greater amount. Small reductions in the guarantee rate have relatively minor effects as long as students remain in the market. However, under certain conditions, a small change in the guarantee rate can force students out of the credit market.

The effects of small business loan guarantees exhibit similar sensitivity to credit policies. Conversion to fair insurance would raise borrowers' costs by 30%. In the experimental Preferred Lenders' Program,

the Small Business Administration offers banks greater flexibility in making loans and reduced administrative requirements in exchange for a reduction in the guarantee rate to 75% from 90%. The program is an effort to make small business lending more attractive to banks and to give banks better incentives to screen applicants carefully. Although the numbers are somewhat speculative, the simulations indicate that full-scale adoption of this program could generate welfare gains to small business borrowers while simultaneously reducing the government's costs of running the program.

Credit as an Instrument of Policy

Careful analysis suggests the existence of several problems in the implementation of credit programs. In many cases, the benefits accrue to borrowers who would have received credit without public assistance.^{19/} Therefore, although the government targets the group it intended, inframarginal members of the group receive the benefit. Because of the large number of inframarginal borrowers, credit programs are, in general, costly relative to the marginal credit they provide.

Credit programs, especially loan guarantees, can create a variety of complex incentives. If designed or implemented poorly, the policies will be counterproductive. Finally, the fungibility of subsidized credit may induce borrowers to substitute debt for equity or capital for labor, without changing their output at all. In many cases, the borrower could use the funds for a completely unintended purpose. Thus, changes in the allocation of credit may not induce similar changes in economic activity.

Budgetary and Management Reform

The single most important direction for credit policy involves the reform of administrative and budgetary procedures, rather than any specific program reform. Budgetary analysis should focus on the costs of current credit decisions, in place of the current emphasis on loan volume and net

cash outflow. Cost figures may be generated by government estimates or by resales and reinsurance of public credit. The latter method is likely to generate higher government cost due to several features of federal credit: lack of standardization, discretionary forbearance, and a web of regulations concerning foreclosure and other features. These features could cause federal credit to sell at a steep discount, relative to government's discounted earnings from holding the asset.

Moreover, asset sales are an inappropriate method of measuring the cost to government in instances where the motivation of the program is to correct an externality.^{20/} Proponents of resales point to previous, seemingly successful loan asset sales. However, the loans resold in previous years featured none of the problems listed above. In addition, the earlier resales featured highly collateralized loans that had the explicit or implicit backing of the federal government.

Therefore, although they provide good incentives for federal credit management at the agency level, resales and reinsurance are likely to raise the costs of credit programs. That is, the government could likely incur lower costs by retaining the assets. A further danger is that asset sales will be used as a highly misleading and inappropriate method of reducing budget deficits. Under a system in which asset resales and reinsurance did not affect deficit figures and in which federal credit had features more suitable for private agents, resales and reinsurance would provide appropriate incentives and clear and immediate cost estimates. Budget practice should quickly evolve toward estimates of the (presented discounted value of the) costs of current credit programs and, when federal credit has been modified appropriately, move towards divestiture of large portions of the government's portfolio of loans and loan guarantees.

A second important administrative initiative concerns the decoupling of policy goals. Much of the controversy surrounding credit policy is created by poorly articulated or conflicting goals. Clear statements of purpose are useful in judging the success of a program and in deciding whether credit is the most appropriate instrument. Programs with competing goals are rarely, if ever, successful at both, and often at neither.

For example, student loans correct a capital market imperfection and provide a subsidy to college attendance. Even if both goals are accepted as legitimate, the confounding of objectives in a single program leads to costly and controversial policies. The program appears to be an unnecessarily expensive way to correct the imperfection and an inefficient way to target a subsidy. A more natural set of policies would be to provide government-backed student loans at minimum cost to the government and provide direct subsidies to students, where needed.^{21/} The alternative set of programs could cost more, less, or the same as current policy. The advantages of decoupling are that it improves the target-effectiveness of the program in reaching both of its goals, and it makes analysis of the success of the program easier.

Finally, further understanding of federal credit is hindered by ineffective and sloppy record keeping by federal agencies. A clear and consistent accounting and administrative system would generate valuable information for the analysis of credit policy.

The Role of Government as a Lender

The federal government is the largest financial intermediary in the country. In recent years, the government has attempted to solve myriad social problems through credit programs. The appropriate role of government in credit markets, however, is more limited.

Successful and cost-efficient credit programs are typically

characterized by clear and consistent goals, narrow objectives, visible costs, and definable benchmarks of success. Programs that focus on improving the operation of capital markets have tended to be most successful, the primary and secondary mortgage guarantee programs in particular. However, other loan guarantees, for students and small businesses, have proven to be expensive and in some cases ineffectual. The differences may be traced to many factors, including those mentioned above, poor incentives and administration, and the use of credit in situations where other subsidy forms would be more appropriate.

Given the comparative advantage of private financial institutions in screening customers and servicing and collecting debts, direct loan programs should aim to complement the private market rather than replace it. Providing a subsidy through a direct loan is an inefficient and illogical method of subsidizing a preferred activity. The largest direct loan programs supply highly subsidized funds to the agricultural sector. Public provision of funds may be defended in this case as a second-best response to a shortage of local bank credit in rural areas due to costly monitoring and interstate banking regulations. However, such reasoning does not justify the large subsidies inherent in current farm credit.

In addition to direct and guaranteed lending, the federal government also implicitly backs the obligations of Government Sponsored Enterprises. The ambiguities thus created could be resolved easily by the government making the relationship explicit, either by purchasing the GSEs, requiring explicit insurance, or passing a law prohibiting public assistance to the GSEs.

In recent years, some analysts have called for massive direct federal intervention under the rubric of "industrial policy." Industrial policy

typically refers to a broad set of government programs - including credit subsidies, trade protection, tax subsidies, and other tools - designed to address structural and transitional issues in the economy, particularly in the manufacturing sector. The principal element in many proposals is the creation of a public financial institution with broad powers to provide credit subsidies for assisting growth industries and restructuring declining industries. The analysis above suggests that policies fail precisely when they are vague or open-ended. Industrial policy proposals often do no more than give license to the proposed bank to find projects it deems worthy - by one of two very broad criteria - and subsidize them. Nothing in the history or analysis of credit policy suggests that government would be successful in such a broadly defined task.^{22/}

Currently, credit subsidies attempt to solve a variety of policy goals. In many cases, and in the most controversial ones, credit subsidies are an inefficient way to achieve the desired goal. Credit policy should return to its original goals: to improve the operation of capital markets, by reducing administrative costs, pooling risks, or providing incentives that reduce default costs. Although large portions of the capital markets appear to be well-organized, the more marginal sectors served by credit subsidies can still benefit by appropriate federal intervention.

FOOTNOTES

1. This figure includes direct loans, loan guarantees, loans of Government-Sponsored Enterprises, and tax-exempt financing. If tax-exempts are excluded, net federal credit still exceeds \$650 billion.
2. On several occasions, the government has provided emergency financial relief in form of loan guarantees, most notably for Chrysler in the early 1980's. The adverse incentives created by these special interventions are analyzed by Chaney and Thakor [1985].
3. Recent research on federal credit policy includes a very informative book by Bosworth, Carron, and Rhyne [1987], and papers by Mankiw [1986], Boskin and Barham [1984], and Smith [1983]. Earlier research includes that by Penner and Silber [1973].
4. The rationing concept employed is that of Stiglitz and Weiss [1981, pp. 394-5]: rationing exists if "either (a) among loan applicants who appear to be identical some receive a loan and others do not and rejected applicants would not receive a loan even if they offered to pay a higher interest rate; or (b) there are identifiable groups or individuals in the population who, with a given supply of credit, are unable to obtain credit, even though with a larger supply of credit they would" receive loans.
5. The supply of funds can easily accomodate an open economy.
6. Additional non-targeted groups may be introduced without changing the results.
7. This assumption can be reversed without any analytical problems. The motivation for the assumption is to avoid situations where, say, students can obtain private loans and IBM can not.
8. There is an infinitesimal chance that the market for loans for these groups clears or vanishes.
9. A pure interest subsidy (e. g. tax-exempt financing) is modelled as a subsidized loan where the government provides only the subsidy, not the loan principal.
10. Additional programs may be analyzed with no new problems.
11. Special Analysis F, Budget of the United States, Fiscal Year 1988, Tables F-11, F-12, F-18, F-19.
12. Estimation methods are described in detail in Chapter 4 of Gale [1987].
13. The base numbers are meant to be representative of recent years, rather than exact replica of any given year. For further details, see Gale [1987], chapter 4.
14. The results for other groups are affected only slightly by the assumptions concerning the status of loans to farmers, students and small businesses.

15. The effect of credit policy for farmers, students, and small businesses depends on the status of their credit market. For example, if each market cleared without credit subsidies, then the introduction of existing policies would raise farmers' credit allocation by 40%, students' by 63%, and small business' by 22%.

16. This result may be especially important for lending programs run by state governments. If the programs succeed in relocating firms, one state's gain is another state's loss.

17. Some of the results derived here are similar to those in Mankiw [1986].

18. However, for an exception to this statement in an alternative model, see Appendix C of Gale [1987].

19. The exception occurs when the target group is redlined without government assistance. I believe that only the student loan market satisfies this condition.

20. This holds because a loan sale provides a measure of the private valuation of the income stream, which is an inappropriate measure of the social cost when an externality exists.

21. Bosworth, Carron, and Rhyne [1987] discuss a similar proposal in chapter 6.

22. See Schultze [1983] for a further discussion of industrial policy.

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