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The Programmatic and Financial Integration of Grants and Loans Within the State Revolving Funds

Prepared for

The Council of Infrastructure Financing Authorities

by

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FOREWORD

The Clean Air Act and the Safe Drinking Water Act establish the State Revolving Fund (SRF) programs as the primary tools for water and wastewater infrastructure financing in the country. By any reasonable measure, the programs are outstanding successes in terms of strengthening the Federal – State partnership to meet the nation's clean and safe water needs and producing impressive numbers of successfully completed projects.

The heightened focus on national water infrastructure needs is fostering renewed interest in the level of Federal resources available, the setting of priorities for assistance, and the mechanisms for providing financing. The relevant committees in Congress are studying these issues and there is an expectation that legislative proposals will be forthcoming. A fundamental consideration in this policy discussion is the continued role of the State Revolving Funds as the core program for funding water infrastructure.

This Monograph is a timely and informative contribution to the developing debate. Prepared by Dr. Paul K. Marchetti, Executive Director, PENNVEST, it is a persuasive analysis of the underlying value and capacity of the SRF model.

Rick Farrell
Executive Director, CIFA

THE PROGRAMMATIC AND FINANCIAL INTERGRATION OF GRANTS AND LOANS WITHIN THE STATE REVOLVING FUNDS

Grants and loans are two distinct mechanisms by which the federal and state governments provide financial subsidies to local communities for the construction of infrastructure projects. Wastewater and drinking water projects are two categories of such infrastructure projects which have received, and continue to receive, federal financial assistance, some of which is disbursed directly to local governments and some of which is allocated to states for their distribution to local governments.

The distinction between grants and loans as subsidy mechanisms often, but not always, has a parallel in the programmatic structures established to convey these subsidies to local communities. One example is the substitution of the Clean Water State Revolving Fund (CWSRF) program for the Construction Grants program that was occasioned by the Water Quality Act of 1987. The latter program provided partial (55 to 75 percent) grants to local communities for the eligible costs of constructing wastewater collection and treatment facilities while under the CWSRF subsidized loans are provided for this purpose, albeit for a broader range of costs.

The discussion that follows makes two fundamental points about the programmatic and financial distinction between grants and loans, particularly with regard to the State Revolving Funds (SRF's). The focus of this discussion is the funding that is already provided by these programs for wastewater and drinking water projects.

- Programmatically, it makes most sense to provide all infrastructure construction subsidies, be they in the form of grants or subsidized loans, through the structure that is already established and has been successfully functioning in all the states since 1988, i.e. the existing SRF structure.

- Financially, it also makes most sense to provide infrastructure construction subsidies to local communities through the SRF programs since they can provide this assistance more efficiently than can independent grant programs. Efficiency gains achieved by the SRF programs translate into more infrastructure construction than can be achieved by comparable grant programs.

These points are discussed in the context of future infrastructure funding proposals that may be considered in the drinking water and wastewater areas. A number of such proposals are being debated as of this writing and more are likely to arise in the future. The discussion presented here is intended to frame this consideration of such proposals, particularly for the Congressional committees who authorize and fund them and the administrative agencies that oversee their implementation.

THE DELIVERY MECHANISM FOR INFRASTRUCTURE CONSTRUCTION SUBSIDIES SHOULD BE THE SRF'S

It is imperative that the existing SRF programs established in each state have the responsibility for accepting and disbursing future wastewater and drinking water infrastructure construction financing that the federal government makes available through the Environmental Protection Agency (EPA). This is true whether the funds made available are intended to be disbursed as grants or as subsidized loans.

Since its creation by the Water Quality Act of 1987, the CWSRF program has been the primary vehicle for financing wastewater infrastructure projects. It represents a departure from and improvement upon the Construction Grants program that it displaced. Since it was created, the CWSRF program has provided $30 billion in low interest loans for 9,500 wastewater projects. Similarly, since its creation by the Safe Drinking Water Act amendments of 1996, the DWSRF has provided $3.2 billion in low interest loans for 1,500 drinking water projects. These programs demonstrate a very successful partnership between the federal and state governments.

This partnership and the success that it has created would be severely threatened by the creation of independent grant programs for drinking water and wastewater projects, for the following reasons:

- Undermining the SRF's - A separate grant program would compete with the SRF programs for funding drinking water and wastewater projects. This would severely restrict applications to SRF programs for similar funding since even the hope of obtaining a grant all but eliminates the desire of most communities to apply for a loan. This is particularly true of the economically distressed communities who are typically targeted by these subsidy programs.

- Wasteful Duplication - The SRF programs already have the structure in place to accept funds from EPA, disburse these funds to recipients and account for their appropriate use. Creating a new administrative structure to perform these same functions, either at the federal or state level, would be an unnecessarily costly duplication of effort and would serve only to reduce the amount of funds available for financial assistance to local communities.

- Confusion for Local Communities - A corollary effect of creating another program to finance projects that are already eligible under the SRF's would be confusion on the part of communities as to which agency to apply to for funding. Communities with either drinking water or wastewater problems would have a more complicated process to deal with, both for application purposes as well as during project development, than they would if all of this funding were simply housed within the existing SRF's. This confusion for small, distressed communities would only be multiplied if other proposed funding programs were to be created in competition with the SRF's.

- Consistent Affordability Approach - Affordability is an important consideration in determining the amount and allocation of infrastructure construction subsidies. Given the critical importance of the affordability concept to such funding programs, it is equally important that the SRF programs be designated as the entities responsible for allocating these subsidies:

    - Many if not all SRF programs already use affordability considerations in determining the terms of the financial assistance that they offer to communities.

    - Since the allocation of grants should be coordinated with SRF loans (a point that is more fully developed in the next section), it is important that the same affordability methodology be used for both types of assistance. It only makes sense that this be done by the SRF programs.

The SRF programs have been established as the water infrastructure financing programs by both Congress and EPA and it is critical that this successful funding partnership continue to be affirmed at the federal level. To refrain from doing this would run the risk of seriously and perhaps irreparably undermining a program that both the federal government and the states have successfully worked together to create over the past fourteen years.

GRANTS NOT TIED TO SRF LOANS ARE INEFFICIENT SUBSIDY MECHANISMS – PARTICULARLY FOR FINANCIALLY DISTRESSED COMMUNITIES

It is financially imperative that any additional subsidies beyond those currently achievable by the SRF programs also be provided through these SRF programs. In particular, the creation of an independent grant program outside of the SRF structure would be fiscally unsound and a public policy mistake. The following discussion explains why this is the case.

The goal of making expensive infrastructure construction projects affordable to distressed communities is one that the SRF programs embrace and already accomplish through adjustments to the terms of the loans that they offer communities. These adjustments are interest rate reductions and extended loan terms. By use of these adjustments, the SRF programs already provide subsidies to their borrowers that are the financial equivalent of grants.

This equivalence hinges on one central assumption, that grant recipients must borrow funds on the open market to finance that share of project costs that are not covered by the grant. This was what occurred under the Construction Grants program and is often the case with other independent grants that are provided for infrastructure projects. Under these grant programs, only a portion of eligible costs are financed by the grant and, at that, eligibility definitions restrict the range of project costs that are covered by the grant. SRF loan recipients, on the other hand, receive the entire amount of project costs from the loan and do not have to borrow from any outside sources.

The other critical element to the following analysis is the relative borrowing costs of the government program providing the assistance (the SRF's in this case) compared with the borrowing costs of the local community receiving the subsidy. It will be demonstrated below that when the interest rate paid by the local community exceeds that paid by the SRF, a subsidized loan program is more financially efficient that is an independent grant program that only provides part of a project's total construction costs. In essence, the SRF program is able to pass along its interest rate savings to the local community.

The examples below demonstrate the following attributes of the SRF program:

- SRF loans already can create subsidies equivalent to grants. Even under the existing authority of the SRF's these subsidies can be as great as those that were provided under the Construction Grants program and can be made even larger by a simple extension of authority to the CWSRF program.

- The subsidies created by SRF loans increase as the local community's borrowing costs increase. As a consequence, these subsidies are greater for the very distressed communities that infrastructure construction subsidy programs are intended to help.

- SRF loans are a more efficient subsidy mechanism than are grants that create equivalent subsidy levels. A given amount of expenditure by the government will translate into a larger amount of infrastructure construction activity if the subsidy is conveyed by an SRF loan rather than by a partial grant.

SRF LOANS CREATE SUBSIDIES THAT ARE EQUIVALENT TO GRANTS

Suppose that a community needs to finance a $1 million water infrastructure project and applies to its state SRF program for assistance. Suppose further that the community is a good credit risk and can borrow on the open market at a AAA rate, say 5.25 percent. If the SRF program provides the community with a $1 million loan an interest rate of 2.0 percent for 20 years, which is typical for SRF programs nationally, this is the financial equivalent to the community of receiving a grant of $253,752 and having to borrow the rest of the project's costs on the open market.

The potential for SRF loans to create subsidies for distressed communities is actually much more dramatic than this. In order to make a project affordable to a distressed community, an SRF program can make its lending even more affordable than this example indicates. In the extreme, a CWSRF program has the ability to lend money at zero percent interest for as long as thirty years. Assuming that such a loan would be made to a distressed community whose open market borrowing costs are 6.50 percent, the $1 million SRF loan would be equivalent to a grant of $632,659, or 63.3 percent.

The Construction Grants program provided grants for at least 55 percent of eligible construction costs, with larger grants, up to 75 percent, available in some cases, presumably for the most financially distressed communities. CWSRF loans can already be structured to create subsidies greater than 55 percent grants. If even greater subsidies than these are desired for financially distressed communities, then these would also be possible within the CWSRF framework if these programs were simply given the authority to forgive a portion of the principal owed on the loans that they make. For a 30 year loan to a distressed community, the principal forgiveness needed to achieve the equivalent of a 75 percent grant would be comparable to a negative interest rate of minus 2.3 percent.

The authority for principal forgiveness already exits under the DWSRF and extending this principal forgiveness authority to the CWSRF programs in order for them to be better able to meet the funding needs of distressed communities has long been a CIFA recommendation and is one that we advance again here.

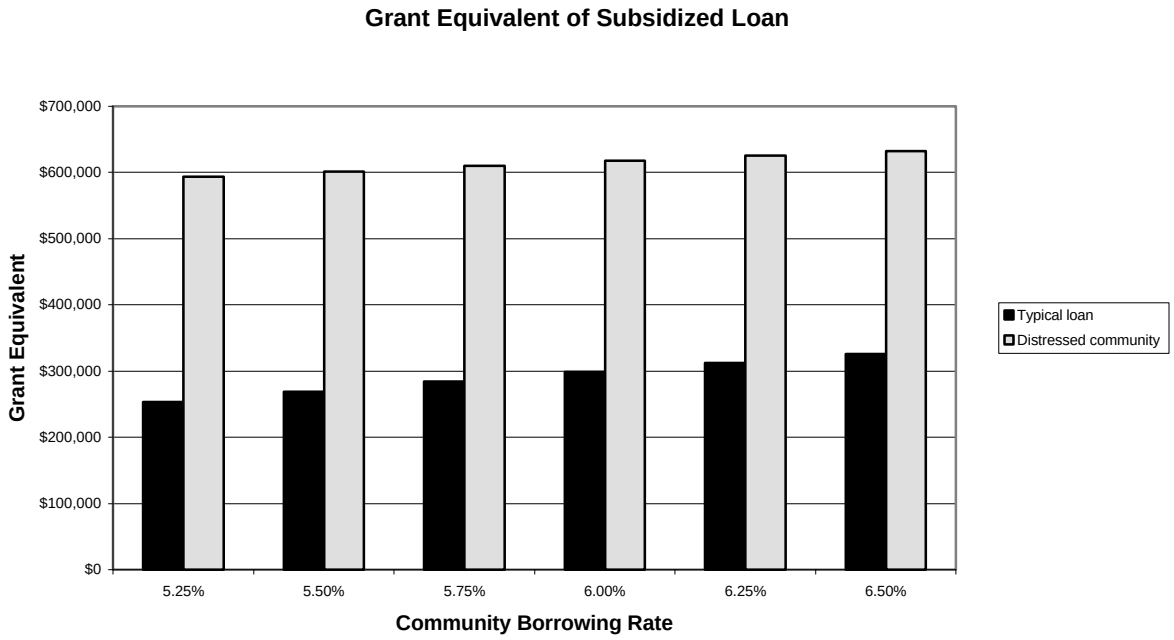
SUBSIDIES CREATED BY SRF PROGRAMS ARE GREATER FOR DISTRESSED COMMUNITIES

Not only are SRF loans able to provide subsidies that are the financial equivalents of grants, but these subsidies are greater for the very communities that infrastructure construction subsidy programs are designed to help, i.e. financially distressed communities.

In the first example above, the value of a $1 million SRF loan to a higher rated community made for 20 years at an interest rate of 2.0 percent was shown to be the equivalent of a $253,752 grant. If, however, the recipient of the SRF loan were a distressed community with a higher open market borrowing rate (i.e. it is a relatively poor credit risk), then the value of this same loan is even greater to that community. For example, if the community's open market interest rate were 6.50 percent, then the same SRF loan would be equivalent to a grant of $326,144. This almost 30 percent increase in the value of the SRF loan's interest rate subsidy

derives completely from the fact that the distressed community must pay more in interest on the open market for that portion of its project's costs that would not be covered by a grant.

The following chart shows the grant equivalent of two $1 million SRF loans for borrowers who pay different interest rates for open market borrowing. The "typical" loan is the 2.0 percent, 20 year loan described above, while the distressed community loan carries a 0.0 percent interest rate and a 30 year term.



Two things are evident from this chart:

- The distressed community loan is significantly more valuable to all recipients than is the typical loan
- The value to the recipient community of both types of loans increases as the community's borrowing costs increase (i.e. as the community becomes more financially distressed).

SRF LOANS ARE MORE EFFICIENT THAN ARE FINANCIALLY EQUIVALENT GRANTS

Because grant recipients must borrow on the open market to pay for the portion of project costs not covered by the grant, SRF loans can actually create more construction than can grants that are equally valuable to the recipient community. This effect is more pronounced the greater is the subsidy created by the SRF loan. This can be demonstrated by example.

Take the case described in the last section – a $1 million SRF loan for 20 years at an interest rate of 2.0 percent. As stated above, this is equivalent, from a distressed community's perspective, to a grant of $326,144, with the community borrowing the difference at 6.50 percent interest. What is helpful to know is the cost of each of these subsidy alternatives to the government entity that creates them. For discussion purposes, this government entity is assumed to be the SRF.

- The cost of the grant option to the SRF is straightforward, it is the amount of the grant that is given away.
- The cost of the subsidized loan is a little more complicated since the loan creates debt service income for the SRF. The net cost of the loan option to the SRF is the amount loaned out minus the income that is earned over time. This income is an asset that the SRF can use to finance additional projects. If the SRF borrows against this income stream to the maximum extent possible, so that there is nothing left at the end of the debt service period, then the amount of new project construction that can be funded from this income stream is simply the present value of this income stream discounted at the SRF's cost of borrowing.[*]

[*] It could be argued that the present value of this income stream should be offset by probable defaults in the SRF program. While there is some validity to this argument, its practical effect is minimal for the following reasons:

- Due to risk pooling and the diverse nature of SRF loan pools, there is a net savings in interest costs to SRF programs that they can pass along to their borrowers, even after the expected value of defaults is taken into account.
- SRF programs are, in fact, extremely safe portfolios. They historically have very low default rates, and can take advantage of state-level credit supervision and enhancement to minimize losses in their portfolios and to enhance market acceptance.

Take the example of the distressed community assistance described above, where a $1 million loan is offered at an interest rate of 2.0% for 20 years and the community's cost of borrowing on the open market is 6.50%. The cost of each subsidy alternative in this case is, respectively:

- Grant: $326,144
- Loan: $253,752 (the $1,000,000 loan minus $746,248 – the present value of the future income from the loan, discounted at the SRF's assumed cost of borrowing: 5.25%).

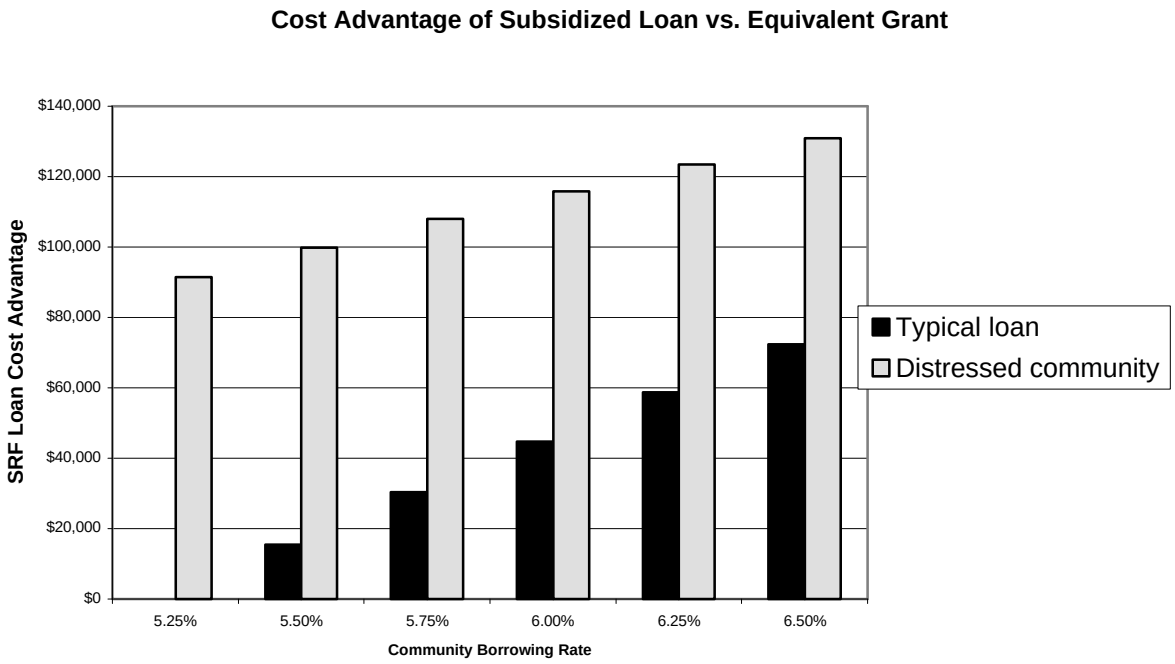
The loan subsidy is $72,392 less expensive to the SRF than is the grant. This is true even though the recipient community is just as well off under each subsidy alternative. Consequently, the loan subsidy is more cost effective than is an equally valuable grant. The savings to the SRF can be used to finance additional project construction that would simply not exist under the grant option.

The relative efficiency of the loan subsidy mechanism is even more pronounced as the benefits to the community created by the loan subsidy increase. Take, for example, the subsidized loan for the distressed community described earlier, i.e. a $1 million loan at a zero interest rate for 30 years. Again, the community's cost of borrowing on the open market is 6.50%. In this case the respective costs to the SRF of the loan and a grant that is equally beneficial to the recipient community are:

- Grant: $593,196
- Loan: $462,329

In this case, the loan subsidy saves the SRF $130,867 in costs that can be used to finance additional projects that would not occur under the grant subsidy mechanism.

The following chart shows the construction that would be created by a $1 million SRF loan, in comparison to a grant that is financially equivalent to the recipient communities. Again, this is shown for communities that face different interest rates on the open market.



Taking the case of a distressed community receiving a distressed community loan, this chart shows that the cost savings that an SRF program would realize by offering a $1 million loan of this type rather than a grant that would be financially equivalent to the local community would be about $130,000. This is a 13 percent savings that could be translated into that much more construction activity by the SRF program.*

What these examples demonstrate is that the loan subsidy mechanism is not just more cost-effective for the SRF than is an equally beneficial grant subsidy but, further, that this relative advantage of the loan subsidy approach actually increases as the SRF creates greater loan subsidies for the financially distressed communities that infrastructure construction subsidy programs typically are intended to help.

* This is actually a minimal estimate of the financial advantage of a subsidized loan compared with a financially equivalent grant. For a more complete discussion of the relative advantage of the subsidized loan option, see section 4 of the appendix.

CONCLUSION

There are a number of programmatic reasons why the creation of separate grant programs outside of the SRF structure would not be a sensible approach to providing added subsidies to local communities for the construction of infrastructure projects. If grants are to be included as a separate and distinct infrastructure subsidy tool, then they should be awarded through the SRF programs. An even better approach, however, would be to simply broaden the authority for principal forgiveness to the CWSRF program. Principal forgiveness achieves all of the objectives of grants and can achieve these objectives more simply within the loan structure of the SRF's.

In no case, however, should separate grants be awarded under any venue that is outside of the SRF's. Separate grants, such as those that were awarded under the Construction Grants program, are inefficient and reduce the amount of infrastructure construction that can be supported by the government's subsidy program. Providing the same level of subsidies through the SRF programs can realize cost savings to the government in the range of 10 to 15 percent. Given the demand for drinking water and wastewater infrastructure funding and the limited amount of federal assistance available for these purposes, wasting these resources by the creation of grant programs independent of the SRF's would be fiscally irresponsible and unsound public policy.

APPENDIX

Section 1 - Definitions

In the following, principal subsidies (i.e. grants) and interest rate subsidies are evaluated on the basis of their impacts on the annual debt service costs borne by the community receiving financing from the SRF. This annual debt service is calculated by multiplying the principal borrowed (P) by a factor that is defined by the interest rate and term of the borrowing. These factors are calculated for both the subsidized loan from the SRF and the unsubsidized market rate loan that the community would need to supplement a grant. These factors, $f(I_s)$ and $f(I_u)$ respectively, are defined as follows:

$$f(I_s) = \frac{I_s}{(1 + I_s)^t - 1} + I_s$$

I_s is the subsidized interest rate paid by the local community on the SRF loan

t is the term, in years, of the SRF loan

$$f(I_u) = \frac{I_u}{(1 + I_u)^t - 1} + I_u$$

I_u is the unsubsidized interest rate paid by the local community on the market rate loan.

t is the term, in years, of the market rate loan

The two types of subsidies being considered are defined as follows:

Principal subsidy (PS)

$PS = PMT_u - PMT_s$

Where: PMT_u is the unsubsidized debt service payment

PMT_s is the subsidized debt service payment

$PS = f(I_u)P_u - f(I_u)P_s$

Where: P_u is the unsubsidized principal amount paid by the local community in the absence of a principal subsidy. This is equal to both the cost of the project being constructed and the amount of the SRF loan.

P_s is the subsidized principal amount paid by the local community with a principal subsidy. This is equal to the amount that the local community must borrow on the open market to supplement a grant.

So, the grant equals $P_u - P_s$

Interest rate subsidy (IRS)

$IRS = PMT_u - PMT_s$

$IRS = f(I_u)P_u - f(I_s)P_u$

Where: I_u is the unsubsidized interest rate paid by the local community on the market rate loan.

I_s is the subsidized interest rate paid by the local community on the SRF loan.

All other variables are as defined above

So, the interest rate subsidy equals $I_u - I_s$

Section 2 - Comparative Subsidy Analysis

Whether a principal subsidy (grant) or interest rate subsidy is worth more to a local community depends upon the principal amounts and interest rates that the recipient would pay with and without the subsidy in the following manner.

$$PS \gtreqless IRS$$

$$f(I_u)P_u - f(I_u)P_s \gtreqless f(I_u)P_u - f(I_s)P_u$$

$$-f(I_u)P_s \gtreqless -f(I_s)P_u$$

$$f(I_u)P_s \lesseqgtr f(I_s)P_u$$

$$\frac{P_s}{P_u} \lesseqgtr \frac{f(I_s)}{f(I_u)}$$

So

$$PS \gtreqless IRS$$

as

$$R_P \lesseqgtr R_I$$

Where: R_x is the ratio of the subsidized value of the subsidy type (principal or interest) to the unsubsidized value.

Section 3 - Comparative cost-effectiveness of principal (grant) and interest discount subsidies from federal government perspective

As was pointed out in the text, the stream of loan repayments accruing from a loan subsidy program has a value to the governmental entity making the loan (the SRF in this case) equal to the present value of these payments, discounted at the government's cost of borrowing. For expository purposes, we also make the following underlying assumptions:

- the SRF borrows funds at 5.25%
- the SRF offers loans to local communities at 2.0%, i.e. $I_S = 2.0\%$
- the term on the SRF loan is the same as that for the local community's market borrowing, i.e. 20 years

Given these assumptions, the cost-effectiveness comparison between the subsidy mechanisms involves finding the amount of local project construction (measured in dollars) that will be supported by each subsidy mechanism (grant or loan) , with the proviso that the local community must be financially indifferent between the two subsidy mechanisms. The relative amounts of construction that will be supported by the alternative subsidy mechanisms will vary depending upon the subsidy recipient's costs of borrowing on the open market (I_U).

Case #1 - Local borrowing rate equals government borrowing rate

i.e. $I_u = 5.25\%$

Define R_P^* as the critical R_P that equalizes the principal subsidy and interest rate subsidy for the local community.

$$R_P^* = \frac{f(I_S)}{f(I_u)} = \frac{f(2.0)}{f(5.25)}$$

In this case, $R_p^* = .746248$

This translates into an SRF grant share of $253,752. In other words, as presented in the text, this loan has the same value for this local community as does a grant of $253,752. This would also be the cost of the grant option to the SRF. Also as stated in the text, the cost to the SRF of the loan subsidy mechanism is the amount of the loan itself, minus the present value of the debt service repayments on the loan. Using the government's borrowing cost of 5.25% as the discount rate, the present value of $1 million loan carrying a 2.0 percent interest rate for 20 years is $746,248. Subtracting this amount from the $1 million loan amount yields a net cost to the SRF of $253,752.

Thus, when the local recipient's unsubsidized borrowing costs equals the SRF program's borrowing costs, principal and interest subsidies that are equally costly to the SRF program, and are equally valuable to the local recipients, support equal amounts of construction activity, $1 million in this case.

Case #2 - Local borrowing rate is greater than the government borrowing rate

Assume $I_u = 6.50\%$

$$R_p^* = \frac{f(I_s)}{f(I_u)} = \frac{f(2.0)}{f(6.50)}$$

$$R_p^* = .673856$$

This translates into an SRF grant share of $326,144. In this instance, the cost to the SRF of providing a grant subsidy is $326,144. Alternatively, the SRF could provide a subsidized loan at an interest rate of 2.0 percent for twenty years that would be equally valuable to the local community. As shown in case #1, the net cost of this loan to the SRF is $253,752. Thus, the SRF can provide the same benefit to the local community by using a subsidized loan rather than a grant and save the difference in the costs of these alternative subsidy mechanisms, $72,392 in this example.

What these cases demonstrate is that the relative cost-effectiveness of the principal and interest rate subsidy mechanisms varies with the ratio of local borrowing costs to SRF borrowing costs. When the interest rate paid by a local community exceeds that paid by the SRF, as is the case

with distressed communities, the interest rate subsidy is the more cost effective subsidy delivery mechanism, compared with a grant that is equally beneficial to the local community. The greater the disparity between the SRF's and the local community's borrowing costs, the greater is the cost effectiveness advantage of the loan subsidy in comparison to the grant subsidy mechanism.

Section 4 – Relative advantage of subsidized loans vs. grants extended

The discussion in the previous section and the text does not account for the full relative advantage of subsidized loans, compared with grants, when both options are evaluated on the basis of the amount of construction that they can support. This is because only the present value of the income from the SRF loan itself was counted in the examples presented above and in the text. This was the amount that was subtracted from the loan amount to derive the net cost of the SRF loan to the government.

What were ignored in this calculation were the successive rounds of funding that the SRF program could derive from the original loan. Just as the original loan creates an income stream that can be evaluated at its present value, this amount itself can be loaned out to create a second income stream that has its own (but smaller) present value. This lending process can, in principle, be continued in successively smaller and smaller increments until the additional funds generated by these loans are exhausted.

The theoretical maximum amount of lending, and therefore construction, that can be generated from a subsidized loan can be many times the amount projected in the above examples and the text. It can be calculated as follows:

$$MC = \frac{(L_{SRF})^2}{(L_{SRF} - PV_{SRFL})}$$

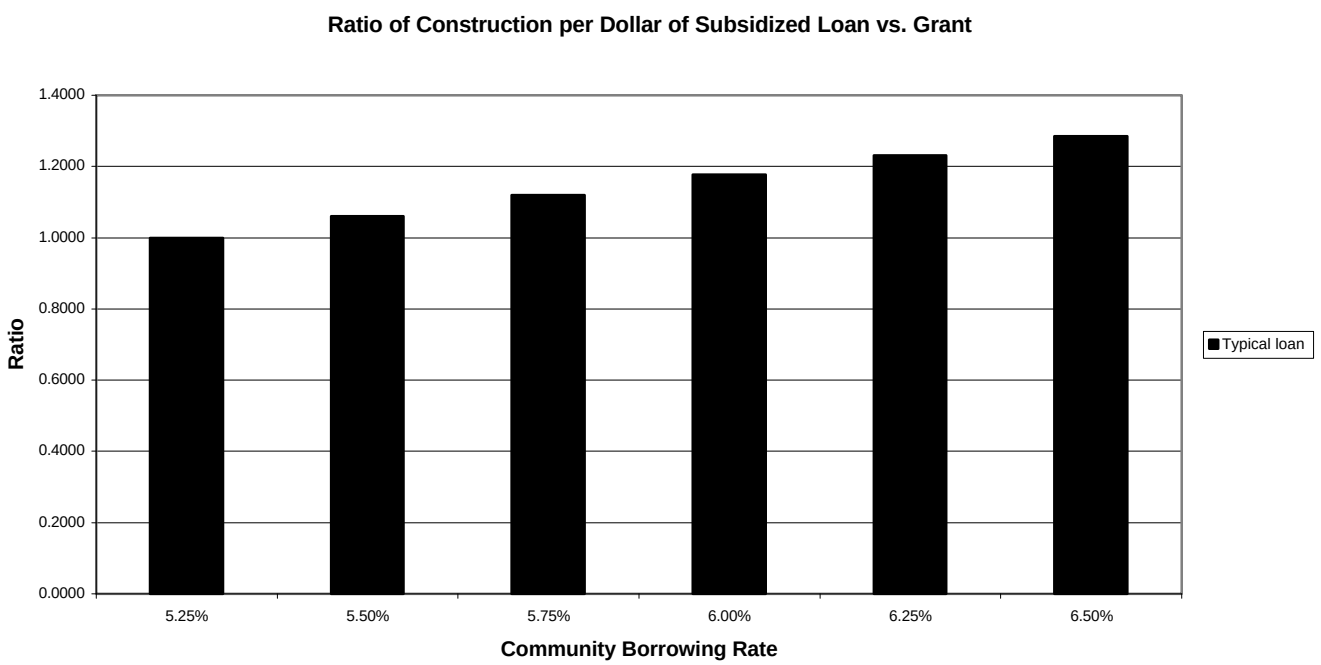
Where: MC Is the maximum amount of construction that can be generated

L_{SRF} is the amount of the SRF loan

PV_{SRFL} is the present value of the SRF loan

The net amount of additional construction that can be generated by the SRF loan mechanism, absent the SRF loan itself is, of course, simply the above calculated amount minus the amount of the SRF loan.

For a typical 2.0 percent, 20 year loan, the theoretical maximum amount of funding that it could ultimately generate is over three times that described in the examples and the text. The following chart compares subsidized loans and grants by displaying the ratio of construction that could ultimately be generated by a "typical" SRF loan compared with the construction that could be generated by a financially equivalent grant. As with previous such comparisons, the relative advantage of the SRF loan increases with the community's cost of borrowing on the open market.



ABOUT CIFA

The Council of Infrastructure Financing Authorities (CIFA) is a national, non-profit organization of state and local authorities providing financial assistance to meet infrastructure needs. CIFA seeks to: (1) encourage the exchange of information on infrastructure financing among and between the States, the national government and the private sector; (2) conduct research on issues, trends and events in the area of public finance; and (3) advocate sound public policies advancing infrastructure financing. The CIFA monograph series is intended to provide a national platform for the presentation of new ideas and analyses of issues affecting federal, state and local infrastructure programs. For additional information on CIFA and the monograph series, contact Rick Farrell at (202) 371-9694.

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