
CAPITAL SUBSIDIES IMPLICIT IN CONCESSIONAL FINANCE

How to Make Them More Transparent and Better Targeted

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Abstract

Multilateral Development Banks (MDBs) finance a significant share of developing country water sector investments. Much of this financing is concessional and often on-lent by national governments, at similar concessional terms, to water utilities. This concessionality carries an implicit subsidy, i.e., the difference between MDB financing terms and commercial financing terms priced more in line with the underlying credit risks. As such concessional financing is most often used for capital investment projects, the implicit subsidy can be considered a capital subsidy.

This working paper asks whether there is an opportunity to increase the value of concessional financing for water sector investments by making implicit capital subsidies more explicit and targeting them to a clearly defined public policy

objective. Specifically, the paper (i) considers the extent to which implicit subsidies exist in MDB lending for the water sector; (ii) identifies a possible approach to quantify the amount of subsidies involved; (iii) outlines an emerging framework to make subsidies more explicit as a basis for improved targeting; and (iv) discusses operational implications. By investigating these issues, the paper intends to be a first step for governments and donors to evaluate how best to use the implicit capital subsidies provided by concessional financing in the water sector. The paper also suggests areas of future research.

While the focus of the paper is on the water sector, the issues and approaches discussed in the paper are generally applicable to concessional lending for infrastructure projects.

1. Introduction

Multilateral Development Banks (MDBs) finance water and wastewater infrastructure in developing countries to a significant extent with concessional loans. For example, between 2000 and 2010 the World Bank provided approximately US\$ 9.4 billion in loans to borrowers for water and sanitation through its highly concessional International Development Association (IDA) arm.¹ Even in some developed countries, concessional financing still assists utilities in meeting specific government policies and objectives, for example, in the construction of wastewater facilities. In addition, many developed country service providers have benefited from concessional finance in the past to allow them to build up their comprehensive infrastructure stock.

Thus, concessional financing plays an essential role in the expansion and improvement of water and sanitation services. However, sources of concessional finance are finite and governments and donors therefore need to determine how to use these limited funds for maximum benefit. Unfortunately, such a rigorous determination is rare. Governments typically on-lend concessional funds to water utilities, on similarly concessional terms, without overtly assessing either the value of the subsidy or its targeting. One reason is that such concessional on-lending “hides” the value of the subsidy that is implicit in the lending terms passed on to the service provider. If that subsidy were made explicit (i.e. transparent), it could trigger a debate amongst policy makers on whether such a subsidy was appropriate both in terms of its amount and its targeting.

Concessional financing is a capital subsidy made available to service providers for investments to expand or improve their assets. A capital subsidy reduces the final cost of service for customers by lowering the debt service component of a cost-recovering tariff. There are, however, only a limited number of studies on capital subsidies—whether assessing

the value of the subsidy, the appropriate subsidy level, or its targeting. This contrasts with the extensive literature available on revenue subsidies, which considers the targeting of subsidies for customer user fees through tariff designs.

In reality, these two types of subsidies are complementary and in the longer term will need to be considered as a package. Capital subsidies should be designed to meet broad national policy goals such as access and service quality, within constraints of available public funds and general affordability. Revenue subsidies are specifically intended to ensure service affordability at the household level within any particular service provider. The different objectives of the two types of subsidies are also reflected in the sources of the subsidies. Central or state governments, or international donors, tend to provide capital subsidies, while revenue subsidies tend to come from other customers (e.g. cross subsidy between different categories of users), or from local governments (e.g. direct payments towards the water bills of low-income households).

This working paper on capital subsidies also provides a timely contribution to an evolving debate within the World Bank. A report recently completed by the Independent Evaluation Group (IEG) on “Water and Development” (2010) highlighted that the Bank appeared to have moved away from “full cost recovery” but did not identify how any deficit between “full cost recovery” and “actual cost recovery” was being fi-

¹ Data source: World Bank Data. This paper draws primarily upon examples from IDA lending, but the methodologies and conceptual frameworks presented could also apply to the International Bank of Reconstruction and Development (IBRD) lending arm. IBRD typically provides loans to middle-income countries at near-market terms with longer repayment periods. However, the amount of subsidy would be lower.

nanced. There are, of course, many definitional terms to be considered but if user fees should at least recover operation and maintenance (O&M) costs and debt service, then the differences highlighted by IEG may derive partly from the concessionality of the loan made to the service provider—thereby making the capital subsidy part of the balancing factor.² This, coupled with the fact that concessional loans will continue to play an important role in financing the water sector in developing countries, means that making subsidies transparent and improving their targeting could help achieve the best value from this public money. Thus, a better understanding of the issue may improve the sector overall and lead to a more informed policy within the World Bank as well as with its client countries.

The authors acknowledge that significant work remains to understand capital subsidies fully—whether their amount or their targeting. However, this topic needs to be approached more methodically and this paper represents a first step in that direction.

This paper does not discuss capital subsidies *per se*, given their pervasiveness in the sector, but instead focuses on

making explicit the actual value of implicit subsidies that are typically provided to borrowers through concessional on-lending terms. Section 2 of the paper defines implicit subsidies, shows how the amount of implicit subsidy can be quantified, and considers the opportunity cost of a lack of transparency and poor targeting. Section 3 presents an emerging framework for better capital subsidy design and the targeting of such subsidies while section 4 highlights operational implications of the framework. Section 5 reflects on the results of the study and suggests possible future work to enhance further the sector's understanding of capital subsidies.³

² Alongside sub-optimal operating expenditures (typically resulting in deferred maintenance) and periodic cash transfers from government to support financially stressed service providers.

³ This paper is based on policy dialogue and project experience gained by the World Bank in South East Asia during 2008 and 2009. Since then, governments have further refined some of the outlined approaches evaluated in this study. However, despite the subsequent changes, these approaches remain relevant as valuable examples that clearly illustrate the concepts presented in the paper.

2. Concessional Finance and Implicit Capital Subsidies

Concessional loans are, by definition, loans below market terms and which therefore contain implicit subsidies. This section describes how the implicit subsidies in concessional lending can be quantified and highlights the opportunity cost associated with those implicit subsidies. Opportunity costs arise from a lack of transparency on the amount of subsidy provided which can limit a more informed debate about their optimal use and targeting.

2.1 Quantifying Implicit Subsidies in the Water Sector

Concessional loans from MDBs are often on-lent by finance ministries to water utilities on terms that are more generous than would be available to those utilities in the commercial market. It is possible to calculate the subsidy implicit in governments' concessional lending by comparing the concessional on-lending terms to the commercial terms. A simple formula can be used to quantify the implicit subsidy.

The first step is to identify a benchmark that represents the terms on which the utility could borrow commercially. After selecting a benchmark loan, the present value of the sub-

sidy implicit in concessional lending—commonly referred to as the level of concessionality—for a given dollar value of a loan can be calculated as the difference between the present value of the concessional and benchmark loan principal and interest payments.⁴

The amount of implicit subsidy can be illustrated by an example from Vietnam based on the model that was in use there until 2010. In Vietnam, where approximately 85 percent of investment in the water sector was financed with concessional Overseas Development Assistance (ODA) loans, the government set on-lending terms based on the size of the city benefiting from the loan. Cities were grouped in five categories according to population size. Category One was the largest and included cities with a population of more than 500,000 while Category Five, the smallest, included cities with a population less than 50,000. A typical loan to benefit a Category Five city would have a maturity of 20 years, a grace period of eight years and an interest rate of four percent. A loan that would have benefited a Category One to Category Four city would have a maturity of 20 years, a grace period of three years and an interest rate of 6.7 percent.

At the same time, some water utilities were also able to borrow from commercial banks, on commercial terms. One utility in Vietnam,⁵ in addition to mobilizing ODA funds on-lent by the Ministry of Finance, borrowed from several commercial sources, including the equivalent of US\$ 520,000 from the Bank for Investment and Development of Vietnam

Present Value (PV) subsidy = PV of concessional loan principal and interest payments – PV of benchmark loan principal and interest payments

Where:

PV indicates a present value calculation of the debt service payments on the loan, discounted at the interest rate of the benchmark loan.

⁴ This calculation follows the principles used to calculate the level of concessionality of IDA credits at the country level.

⁵ This example refers to the Binh Duong Water Supply Company, located outside Ho Chi Min City, which was analyzed in the study: *Developing a New Financing Framework for the Urban Water Sector in Vietnam: Final Report to World Bank*. Castalia (December 2008).

Table 1: Loan Terms for a Representative Water Utility in Vietnam

Source	Interest Rate (percent)	Maturity	Grace Period
BIDV (Commercial)	10.2%	5 years	0 years
Ministry of Finance	4.0%	20 years	8 years

Source: WSC accounts. As reported in "Developing a New Financing Framework for the Urban Water Sector in Vietnam: Final Report to World Bank". Castalia (December 2008).

(BIDV). Table 1 compares the lending terms from BIDV with the concessional ODA on-lending terms offered by the Ministry of Finance.

Clearly, the Ministry of Finance terms are more generous than the commercial terms, as it is willing to bear more risk, for lower return, than a commercial bank. By agreeing to lend and bear risk without a compensating return, the Ministry of Finance is providing an implicit subsidy to the water utility—and all other utilities to which it lends at concessional terms. Applying the above equation—with the subsidy expressed in percentage terms—shows that the concessional loan terms from the Ministry of Finance to the water utility imply a subsidy equivalent to 66.3 percent of the loan's total value. Only a few utilities, however, are able to borrow from commercial banks, or if so, only for a fraction of their required investment needs. Nevertheless, if utilities are able to borrow money from commercial banks as well as concessional financing sources, this approach can quantify the subsidy element implicit in ODA loans.

Selecting a benchmark loan

However, it can be difficult to select an appropriate risk-equivalent benchmark loan, especially in the water sector where very little "true" private sector commercial lending reflects full-risk premiums. Also, in the example of the Vietnamese water utility, it is likely that the lending terms from BIDV are a lower bound estimate of true private sector commercial financing as BIDV is a state owned commercial bank which may under-price some of the underlying credit risks.⁶

The choice of benchmark loan is important, because it has a significant effect on the estimate of the implicit subsidy. For example, if the Vietnamese water utility took another commercial loan with a five-year maturity, no grace period, and an interest rate of 13 percent, the benchmark from this loan would show a much higher level of implicit subsidy when compared with the implicit subsidy calculated using the commercial loan with a 10.2 percent interest

rate. The concessional loan with a five-year maturity and 13 percent interest rate would result in an implicit subsidy of 75.6 percent as opposed to 66.3 percent—a significant difference. This comparison highlights why it is important to choose an appropriate benchmark loan. In the water sector, finding the most suitable benchmark loan is likely to remain problematic, as there are few private sector commercial lenders. Nevertheless, despite these challenges, subsidies implicit in concessional finance can still be made explicit.

Implicit subsidy calculations are not only sensitive to the adopted benchmark loan but also to the interest rate and grace period of the concessional loan. Box 1 provides further discussion of the sensitivity of the implicit subsidy calculations to the assumptions used in calculating the subsidy component.

2.2 Opportunity Cost of Implicit Subsidies

Implicit subsidies are, by definition, non-transparent and this can make them difficult to target. If governments direct subsidies in a way that cannot be easily analyzed or debated, the subsidies are likely to be less successful in serving the desired public policy objectives. There is an opportunity cost if the subsidy element in concessional lending is not effectively targeted—the additional benefit that could have been achieved had the subsidy been explicit and well-targeted.

Concessional loans can both target and support public policy objectives. For example, a concessional loan dedicated to small towns or to increasing access in under-served areas supports a clearly defined objective. However, because the

⁶ An attempt was made to use the World Bank and IFC's Municipal Fund pricing as benchmarks for private sector commercial lending in Vietnam's water sector. However, the Municipal Fund had not, at that time, completed a water sector investment in Vietnam.

Box 1: Sensitivity of Implicit Subsidy Calculations

Variations in the repayment terms, including maturity, grace period and interest rate of a loan can have a significant effect on the level of implicit subsidy. The following table shows the sensitivity of implicit subsidy calculations to changes in these terms of a concessional loan.

The implicit subsidy amounts were calculated by setting the present value (PV) of the grant plus a 10-year government bond* (assuming a bond yield of 15 percent and no grace period) equal to the PV of the loan under the relevant concessional on-lending terms.

Concessional interest rate	Repayment period (years)	Grace period (years)	0			
			3	5	8	
6.7%	10	Implicit subsidy (as a percentage of loan):	27.7	49.1	59.3	70.7
	15		33.9	54.3	64.1	74.7
	20		38.2	57.8	67.2	77.3
4.0%	10	Implicit subsidy (as a percentage of loan):	36.5	53.8	62.3	71.8
	15		44.8	60.7	68.5	77.0
	20		50.4	65.3	72.5	80.5

This table illustrates the sensitivity of implicit subsidy calculations to different loan terms. Based on the calculations above, differences in the grace periods of loans cause the most significant variations. For example, a loan with a concessional interest rate of 6.7 percent, and a repayment period of 10 years could have an implicit subsidy component that ranges from 27.7 percent with no grace period to 70.7 percent with an 8-year grace period.

**Note:* This example is based on the general approach adopted in Vietnam up until 2010 to illustrate the effect of different choices in relation to interest rates, grace periods and repayment periods.
Source: Authors' calculations

subsidies contained within the loan are often not quantified the amount of subsidy may not be clear, i.e., the exact amount per additional connection. This lack of clarity may hinder a more informed and structured policy debate about alternative uses of public funds.

To be well-targeted, a subsidy should be both directed toward a defined policy objective, and paid in a way that promotes that objective. Yet this is not always easy to achieve, as illustrated by the following examples.

The government of Vietnam’s policy, as promulgated through Decision 181⁷ on-lending terms, seemed to promote investment in the water sector in general, and in smaller Category Five cities in particular. This should have resulted in a constant degree of subsidy for all Category One through Category Four cities, along with a constant preference (in the form of a higher degree of subsidy) for Category Five cities. However, studies indicate that this has not occurred.

Further, as shown in table 2, the AFD and World Bank programs subsidize all categories of cities, and have prefer-

ential terms for smaller cities. However, the level of subsidy, and the extent of the preference for Category Five cities, arbitrarily differs between programs—a Category Five city that borrows under the AFD program receives only a five percentage point preference over a Category One city, while the differential under Decision 181 would be about 13 percentage points. Similarly, when Decision 181 targets a subsidy of 57.8 percent of total loan value for larger towns and cities, the World Bank program offers these towns and cities a larger subsidy amount, equivalent to 69.7 percent of the total loan value. These discrepancies illustrate how difficult it is to create a scheme that targets public resources effectively toward government objectives when subsidies remain implicit.

⁷ At the time of this study, Decision 181 was the government regulation establishing what the on-lending terms should be and it intended that subsidies should vary between the categories of city. This Decision has since been superseded by a new approach, which continues to develop the sector’s on-lending mechanism.

Table 2: Implicit Subsidies in Concessional Loans to the Water Sector in Vietnam

Loan Source	Town sizes	Repayment period (years)	Grace Period (years)	Interest Rate (percent)	Present Value (percent)	Subsidy Component (percent)
Decision 181	Category Five Cities ¹	20	8	4.0	19.5	80.5
	Category One to Four Cities ¹	20	3	6.7	42.2	57.8
Agence Française de Développement (AFD) for Vietnam Development Bank (VDB)-managed water revolving fund	Category Five Cities	25 ³	8 ²	0.0	11.6	88.4
	Category One to Four Cities	25 ³	8 ²	5.0	18.7	81.4
World Bank in Vietnam Urban Water Supply Project I	Category Four and Five Cities	20	3	3.0	31.9	68.1
	Urban Centers, including Category One to Four Cities	20	5	5.4	30.3	69.7
	Bond (Benchmark) ³	10	0	15.0	100.0	0.0

Notes:

¹The specified lending rate was 33.3 percent * L (the current state investment credit rate for VND-denominated loans—which at 5 November 2008 was set at 12 percent) for Category 5 cities, and 55.5 percent * L for Category 1 to 4 cities. However, Decision 181 did not specify the repayment period or grace period for either group of cities. For both groups, the authors have assumed a repayment period of 20 years, which is the cap, as well as a grace period of 3 years for Category 1–4 cities, reflecting the construction period for new water facilities, and 8 years for Category 5 cities, reflecting their need for greater concessionality.

²These are maximum values.

³The 10-year government bonds (at November 2008) were issued by Vietnam Development Bank (VDB) at 100,000 dong, and have an interest rate of 15 percent per annum. The government bond was chosen as a benchmark because it was difficult to select a risk-equivalent commercial loan. Arguably, a more sophisticated methodology would show an actual rate for each borrower or a class of borrowers, but this would be highly complex.

2.3 Implicit Subsidies are Widespread

Concessional finance of water infrastructure is common in both developed and developing countries. Concessional-ity takes different forms ranging from subsidized ODA on-lending to financing via tax-exempt municipal bonds. The following examples illustrate how concessionality prevents the subsidy element from being transparent, thereby making it more difficult to target the subsidy to a clearly defined policy objective (see also Table 3).

In the Philippines, the Local Water Utility Administration (LWUA), a specialized lending institution that supports water investments, typically offers concessional loans with 25-year maturities and a four-year grace period on both interest and principle. The government and the recipients are aware of the concession rates of the financing, but not its exact value. Any local water district utility formed according to LWUA's rules with an eligible project can receive a loan. This means that LWUA's lending is targeted toward encouraging local water utilities to corporatize and follow LWUA's rules. However, the subsidies are not well-targeted to other government objectives, such as expanding access or serving poor households and the exact value of the subsidy is not known.

In the United States, revolving funds set up at the state level provide concessional lending to local water and sanitation service providers. States receive matching federal grants for fund capitalization. Interest rates on loans to providers are typically 50 percent of market rates, though this varies by state. States provide an explicit grant component that is transparent, and a concessional loan component, the subsidy element of which is not transparent. States are required to disclose information to the public about their programs and the projects that they intend to fund.

As all states which establish a revolving fund are eligible to receive federal funding, and all water companies willing to undertake an eligible project in a state can receive funding from the revolving fund, the subsidy is not well targeted to a specific group of beneficiaries—all projects that expand access

⁸ Output-based subsidies have a cost—they increase the cost of financing, as well as the cost administration in relation to upfront subsidies. Capital investments need to be financed (most likely with a loan) until the date in which the subsidy is paid. The delivery of outputs needs to be verified by an independent agent, thereby increasing subsidy administration costs.

Table 3: Examples of Concessional Finance in the Water Sector

Program	Key Water Sector Financing Instrument	Is the subsidy transparent?	Is the subsidy well-targeted?
Vietnam	The Ministry of Financing in Vietnam on-lends loans from MDBs at highly concessional rates for water sector investments.	No	Partially but not explicitly
Philippines	The Local Water Utility Administration (LWUA) provides concessional loans for water sector investments	No	Partially but not explicitly
U.S. State Revolving Funds	Revolving funds set up at the state level provide concessional lending to local water and sanitation service providers.	Partially	Partially but not explicitly
U.S. Tax-exempt Municipal Bonds	Tax exempt municipal bonds used to financing infrastructure, including for water projects.	No	No

to good quality sustainable water service are eligible for the subsidy. States develop a ranking system for projects to determine funding priority and give priority to projects that serve poor communities or address specific public health concerns.

In addition, municipalities in the United States are allowed to sell municipal bonds to finance local projects, including water projects. Interest paid on the bonds is exempt from federal tax (and from state income tax in the state where the bond was issued). The level of the subsidy in the tax exemption can be quantified, but is not disclosed and consequently is not transparent. The tax exemption represents a subsidy from the federal and state governments that is not tied to a

specific sector objective nor targeted to any specific set of beneficiaries other than those that seek to fund public projects through bond issuance.

In all of these cases policy makers appear to have made an underlying, but not explicit, assumption that a subsidy is warranted—to encourage expansion of access to water services, or because poorer communities need more support than richer ones, or to encourage formation of corporate entities on the premise they will provide better service than non-corporatized entities—and that the political process will result in public investments that maximize positive externalities to communities.

3. How to Make Better Use of Implicit Capital Subsidies

Governments could achieve more of their policy objectives with the same level of public resources if implicit subsidies were more transparent, and targeted better. This section provides an overview of an emerging conceptual framework to improve subsidy design and presents a step-by-step approach to apply the framework to an implicit subsidy scheme. The framework is based on the premise that an implicit subsidy exists, and that the government wants to make this subsidy explicit and better targeted. It consists of four basic steps:

- Step 1: Quantify the amount of the subsidy
- Step 2: Disclose the subsidy
- Step 3: Define policy objectives
- Step 4: Design a subsidy mechanism to achieve policy objectives including:
 - a: Eligibility criteria
 - b: Payment mechanism
 - c: Subsidy amount per recipient

A summary of the framework is provided in figure 1 and the specific steps described in greater detail below.

Step 1: Quantify the Total Amount of the Subsidy

The starting point for reform is to establish the value of the implicit subsidies currently provided. The subsidy can be quantified using the methodology described in section 2.1—comparing the present value of debt service on a concessional loan with the present value of debt service of

a benchmark commercial loan (using the benchmark loan interest rate as the discount rate in both cases).

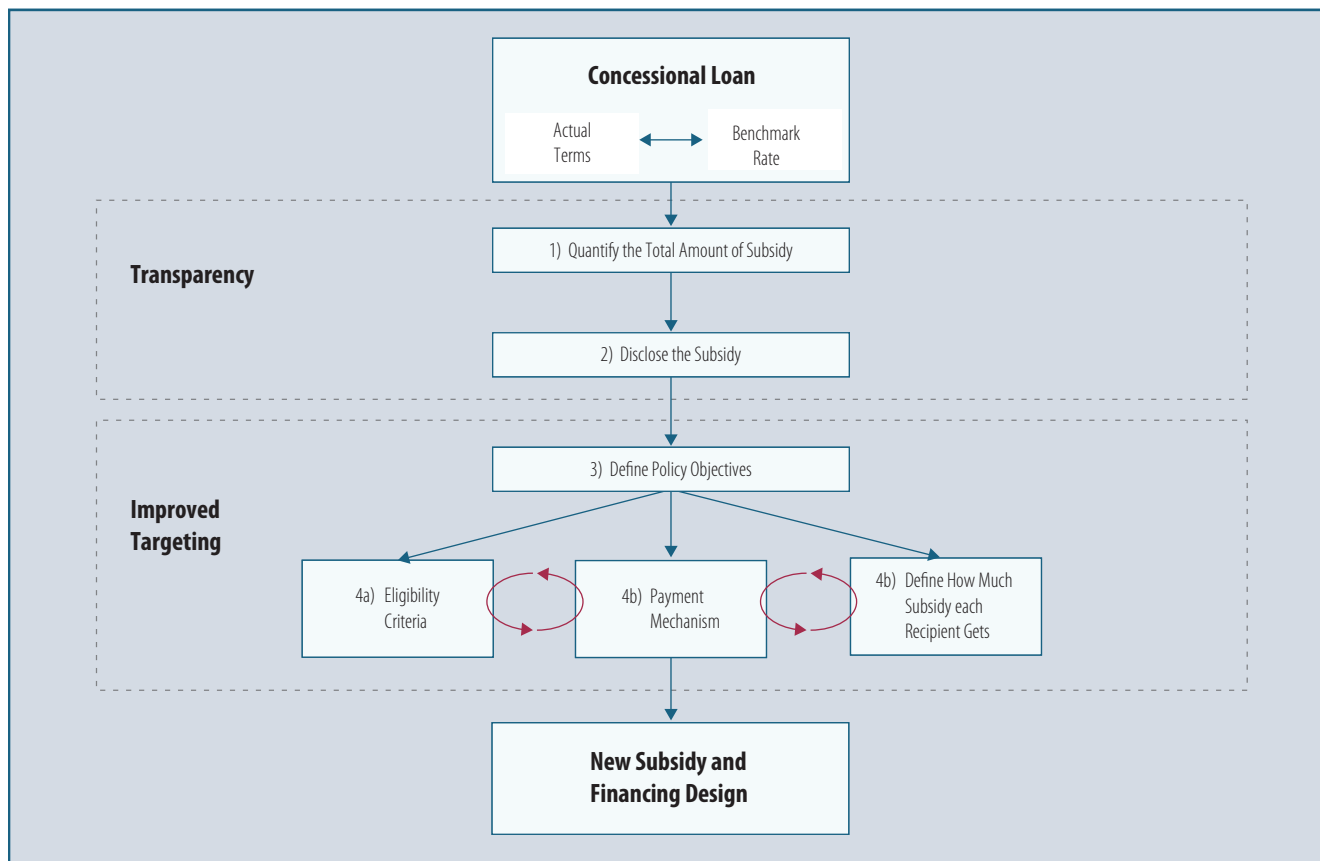
Step 2: Disclose the Subsidy

If policy makers disclose the subsidies they can encourage debate among officials, politicians and the public about whether these subsidies are in the public interest, or whether they should be changed. Simply knowing how much subsidy exists provides clear value added for more informed policy debates. A key question relates to the best method to disclose the subsidy. There are essentially two options. The first option is for a government to disclose the value of the subsidy by “administratively” indicating on a concessional loan agreement the equivalent grant amount that the borrower is effectively receiving by taking the loan on concessional rather than commercial terms. The second option is for a government to actually separate the concessional loan into two components—a commercial loan and subsidy element. The different operational implications between the two options are discussed in section 4.

Step 3: Define Policy Objectives

After changing the implicit subsidy to an explicit subsidy, policy makers can then determine the most appropriate way to target the subsidy in order to achieve policy objectives. Policy makers should first define the policy objectives that the subsidy will target, and then determine whether a subsidy is necessary to meet these objectives. While policy makers will need to determine their own objectives given the

Figure 1: Improved Capital Subsidy Design



specific country context, some common objectives in the water sector include expanding access, improving services, and enhancing efficiency.

Step 4: Decide on Subsidy Allocation through Three Interrelated Design Criteria

Step 4a: Eligibility criteria—Who will be eligible for the subsidy

After the government has defined its policy objectives, it needs to take three interrelated steps to improve the targeting of subsidies. The first is to define those eligible to receive the subsidy—targeting recipients that are consistent with the policy objectives. The following criteria can be used to define eligibility:

- *Location*—the government may want to target rural areas or less developed regions of the country

- *Income*—the government may want to target low income households
- *Utility Performance*—the government may want to encourage and invest in utilities that are financially viable, technically efficient, or well-governed.

Selecting eligibility criteria almost always involves a compromise. Often the best performing utilities are in the richest and most developed regions of the country, creating a trade-off between rewarding performance and helping disadvantaged regions. How the government resolves this dilemma depends on the policy objectives and their relative importance.

Step 4b: Payment mechanism—What the subsidy is for, and how it will be paid

Governments need to determine the most appropriate payment mechanism—what the subsidy is actually paid for. There are three broad types of payment mechanisms for subsidies:

- a subsidy for inputs, particularly for capital expenditure on new infrastructure;
- a subsidy for outputs, such as new connections installed; and
- a subsidy for performance, such as meeting certain financial, technical, or governance targets.

Traditional concessional loan schemes are essentially subsidies for inputs because concessional loans are usually provided to finance new capital expenditure. Governments may continue to provide a subsidy for capital expenditure, even after making the implicit subsidy explicit. However, once the implicit subsidy has been made an explicit subsidy, the subsidy element can then be separated from the loan element. It is then possible to pay the subsidy for reasons other than simply capital expenditure, for example, on an output basis (see below). When governments find that subsidizing capital expenditure is not the optimum method to improve services—for example because the infrastructure is poorly planned, or is not maintained and so fails to deliver as expected—they may choose to switch from subsidizing inputs, and instead subsidize outputs.

Governments are increasingly using output-based subsidies to ensure that the subsidy delivers the desired results. Output-based subsidies could be given for installing new working connections, or as a specified contribution toward the cost of water delivered to low-income customers. If the subsidy payment is based on the value of the output, and not the cost of the inputs, then output-based subsidies not only encourage results, but also provide incentives for efficiency.⁸

Step 4c: *The subsidy amount per recipient and how the amount should be calculated*

Once the government has made the implicit subsidies explicit, defined the policy objectives and chosen the preferred payment mechanism, it needs to decide the amount of subsidy each recipient will receive. In principle, this amount should be based on the social value of the output created.

Some objectives, however, are more difficult to value in monetary terms—for example the value to society of a household receiving a new water connection—but there are a number of common ways to determine the level of subsidy.

- Subsidize a percentage of the capital cost.
- Determine the subsidy needed on a case-by-case basis to cover the difference between the cost of the service (including full capital cost recovery) and the tariffs paid by end-users.
- Set a fixed subsidy for each unit of output and allow utilities to decide if this fixed subsidy is sufficient to cover their net costs of expanding service.
- Establish a challenge fund in which utilities compete based on the amount of subsidy they require, and award the subsidy to the utilities that require the least subsidy.

4. Operationalizing Improved Capital Subsidy Designs

Governments might be able to achieve more of their policy objectives with the same level of public resources if the preceding emerging framework is implemented—thereby providing an opportunity to increase the value of concessional financing from MDBs for water sector investments by making implicit capital subsidies more explicit and targeting them to more clearly defined public policy objectives.

If policy makers adopt this emerging framework, or a similar one, they will probably encounter some practical implementation issues when it is applied. Although these will be very situation specific, this study has identified a number of generic issues that are likely to be relevant. This section outlines four of them.

Section 4.1 discusses how to make the implicit subsidy explicit. Section 4.2 highlights the changes in a borrower’s cash flow that may result from converting a concessional loan into a commercial loan and a grant. Section 4.3 explores which government entity is best placed to administer an explicit subsidy. Section 4.4 outlines how the amount of the subsidy could be determined while section 4.5 considers how the capital subsidy framework, once established, can evolve.

4.1 How to Make an Implicit Subsidy Explicit

There are several ways to make implicit subsidies explicit, and each has different advantages and disadvantages (see table 4). This section considers the advantages and disadvantages of two possible approaches which can be used once the subsidy amount has been determined using the formula presented in section 2. These are:

Disclosing the concessional loan in terms of its constituent parts. This means disclosing the equivalent values of a loan on commercial terms and a capital subsidy component (“disclosing”)

Separating the concessional loan into a loan on commercial terms and a subsidy (“separating”).

While the disclosure option begins a process of raising sector awareness about the value and cost of the implicit subsidies inherent in concessional loans, it is a weak signal which does not fundamentally change the financing arrangements or incentives in the sector. It represents the business-as-usual

Table 4: Comparison of Options for Making Capital Subsidies Explicit

Option	Advantages	Disadvantages
Disclosing	<ul style="list-style-type: none"> Simple implementation Makes the subsidy element explicit and starts to change awareness in the sector 	<ul style="list-style-type: none"> Limited opportunity to use subsidy to create incentives for borrower to achieve outputs Sends weak signals to the sector on financing issues
Separating	<ul style="list-style-type: none"> Explicit subsidy could be used to create incentives to borrower to achieve results Clear signal to borrower of cost of commercial funds First step towards transparent sector financing that will facilitate the entry of domestic capital into the sector. 	<ul style="list-style-type: none"> More complex to implement because it will require borrower to be creditworthy on commercial loan component, and introduces more risks to borrower by bringing forward loan repayments and delaying subsidy disbursements.

Source: Authors.

approach, albeit with greater transparency on the subsidy amount.

Governments and policy makers have sound reasons to progress from disclosing the capital subsidy to a more explicit separation of the components. If the concessional loan is separated into a loan on commercial terms and an explicit subsidy component this provides the clearest distinction between the amounts of the commercial loan and subsidy components. Importantly, a clearly separated subsidy component will create the opportunity for other financial institutions to provide the loan component. This will allow, and encourage, a gradual development of local private sector financing for the water and wastewater sector. This should be a long-term sector goal of any government in a developing country as it will release donor funds for other purposes and introduce greater accountability and sustainability into the sector.

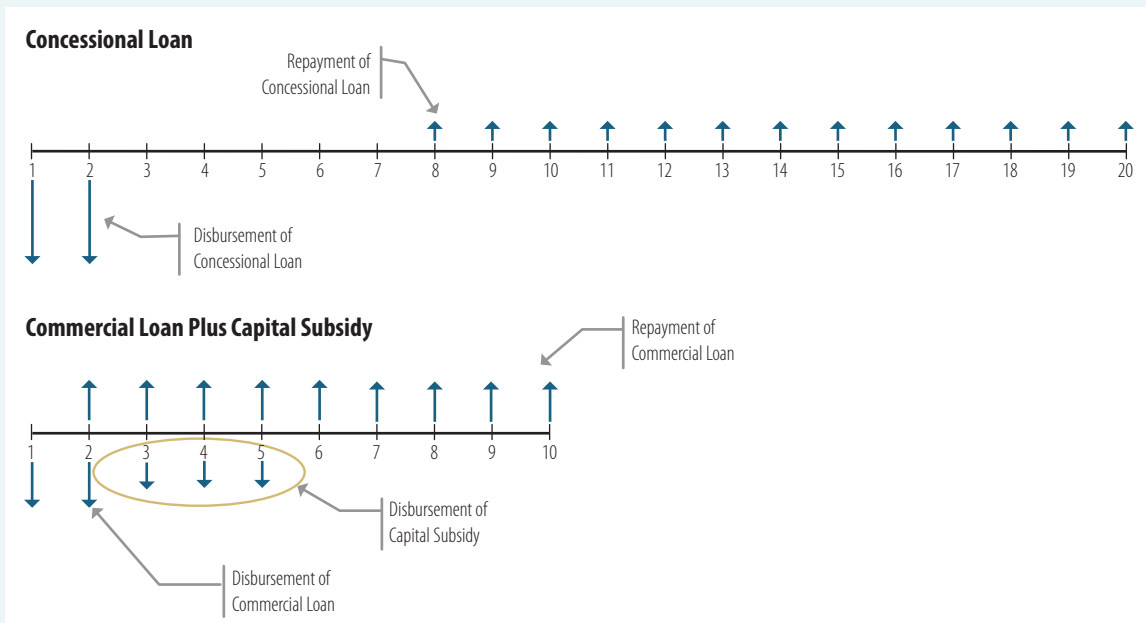
There are, however, some disadvantages if the concessional loan is separated into a loan on commercial terms and a grant component. It would certainly be more complex for a government to implement than simply disclosing the subsidy. Also, moving from a concessional loan to a commercial loan combined with a grant can affect the borrower's cash flow (see section 4.2). However, if implemented carefully and gradually, this approach offers a solid foundation for the long-term financing of the sector.

4.2 Cash Flow Impact of Converting to a Loan on Commercial Terms and a Grant

If an existing concessional loan is separated into a loan on commercial terms and a grant it may have a significant impact on the cash flow of the borrower, even if the net present

Box 3: Impact on Cash Flow of Concessional Loan versus Separate Commercial Loan and Capital Subsidy

The concessional loan in the first figure below has a maturity of 20 years and a grace period of eight years. The loan is disbursed in full to the borrower in the first two years, and repayment of the concessional loan begins in year eight. The second figure shows the disbursement and repayment of a loan on commercial terms and an explicit output-based subsidy component. The loan depicted has a maturity of ten years with no grace period and is disbursed in full in the first two years of the loan. Repayment of the loan begins after the loan is disbursed in year two and is completed in year ten. The explicit capital subsidy is disbursed based on achievement of outputs in the third, fourth and fifth years of the agreement. This approach illustrates a longer term model where the incentivizing potential of the separation model is maximized. In the short-term the capital subsidy would be paid in year one, along with the loan.



value of the debt service remains the same. The loan may originate from the government, but it may also come from a commercial lending institution and this has implications for commercial banking relationships, as the change in cash flow is likely to change the risk profile of the borrower in the view of potential commercial lenders.

The borrower's cash flow from loan proceeds will change because the amount of the commercial loan is less than the concessional loan, but with a higher interest rate and shorter grace period. Further, if the disbursement of the capital subsidy is tied to the borrower achieving certain outputs, the likelihood and timing of the disbursement of the subsidy may also change.

The indicative cash flows for the concessional loan (with implicit subsidy) and the loan on commercial terms with an explicit, output based, capital subsidy are presented in the two figures in box 3 with the disbursements of the loans and subsidies represented by downward arrows, and the repayments of the loan represented by upward arrows.

The change in the borrower's cash flow with the separation model may make potential lenders more cautious about the borrower's ability to repay the loan component. Without the substantial grace period and lengthy maturity of the concessional loan, borrowers will need to pay back more of the loan earlier than under the concessional on-lending scheme. As a result, when evaluating whether to provide the borrower with a loan, the lender is likely to require the borrower to have more cash available to cover the earlier repayment of the loan.

Cash flow considerations highlight the need to consider a planned and gradual roll out of any separation model. Therefore, governments may need to continue to provide concessional loans to weaker service providers under a "disclosure model", while moving stronger service providers into a separation model.

4.3 Define Who Administers the Subsidy

If the government separates the concessional loan into a loan on commercial terms and an explicit capital subsidy, it will need to decide how to administer the subsidy component. Concessional loans from development banks are typi-

cally on-lent by recipient countries' ministries of finance. The government would also need to decide whether the ministry of finance is the appropriate administrator of the subsidy, or if other institutions are better placed to be the subsidy administrator.

In defining who will administer the subsidy, the government should consider whether there are institutions already performing this function, if they are performing it well, and if the institutions are independent of any banks that might provide the commercial loan. This independence from commercial lenders is important to ensure that subsidy approvals are not distorted by banks' commercial interests if they are providing the loan component.

These criteria give the government several options. One possibility is that a finance ministry continues to be responsible for the administration of both the lending component, on commercial terms, and the grant component. Alternatively, the ministry could channel the commercial loan component through a commercial bank, and channel the grant component through a separate grant-making facility. This facility could be housed within an existing institution—such as a state development bank—and could provide grants to utilities that borrow at commercial rates from the commercial bank. Clearly, many other combinations and permutations are possible and these would be determined on a case-by-case basis.

4.4 Determining the Subsidy Amount—the Benchmark Loan

Section 2 presented a methodology to calculate the value of the subsidy contained in a concessional loan. This illustrated how the variables of interest rate, grace period and repayment period affected the value of the subsidy amount. The calculation assumes the existence of a benchmark loan (i.e. a loan from a commercial institution offering terms appropriate to the assessed riskiness of the borrowing water company), with the default proposal being the rates from a long-term government bond in the absence of material commercial lending into the sector.

In developing countries the commercial benchmark loan may not exist, or its terms may be highly volatile (thus affecting the value of the subsidy between one period and the next). Consequently, a benchmark that is more stable, readily

understood, and adequate for the purpose is required. That benchmark is likely to vary from country to country but its selection should follow these criteria.

It is important to note that this working paper does not necessarily attempt to develop the best or most intellectually satisfying subsidy model, but aims to improve understanding about the amounts and targeting of subsidies. It will be sufficient if the benchmark loan is viewed by sector professionals as a productive new way to consider subsidies. Later, as the sophistication of the sector increases and more commercial lending occurs, policy makers can take a more nuanced approach to setting the benchmark loan.

4.5 Evolution of Subsidy Design

When governments take initial steps to make implicit subsidies explicit, they are likely to select a simplified approach

to ease implementation. Therefore, they may choose to start with the “disclosure model” for the implicit subsidy, provide the funds as payments for inputs, and continue with eligibility criteria similar to those in the existing concessional finance scheme.

Periodically the design of the subsidy may be reevaluated, and if needed, improved to meet the government’s policy objectives more fully. This could mean that:

- The method of making the subsidy explicit evolves from the “disclosure model” to the “separation model”
- The payment mechanism evolves from payment for inputs to payment for outputs
- The eligibility criteria evolve to allow more effective targeting of the subsidy
- Within the sector, the focus of the subsidy will shift from water supply and toward wastewater (see box 4).

Box 4: Subsidy Design Should Evolve from Water Supply to Wastewater

Subsidies for the water sector are commonplace. Policy makers in developing countries have frequently chosen to provide subsidies for the water sector, and have used concessional finance to do so. Often, the water sector choice is subsidized at the expense of wastewater services. Consequently, many developing countries have larger, more advanced water sectors and smaller, less-developed wastewater sectors that receive comparatively smaller subsidies in dollar value terms.

As the water sector matures—for example, as a region becomes more developed, levels of access to water services may increase, and higher incomes enable people to begin paying more for services—policy objectives may change. Governments may then reduce the level of subsidy to the water sector and instead target that subsidy to more appropriate policy objectives, perhaps by increasing the subsidy for wastewater services—where there are good public considerations, significant negative externalities, and a low willingness to pay by consumers.

Therefore, the subsidy may gradually evolve a dual focus with a smaller, poverty alleviation targeted subsidy for water supply services, and a majority of the subsidy focused on improving wastewater services.

Source: Authors

5. The Way Ahead

Concessional finance for the water sector involves implicit capital subsidies that are generally not transparent and often not well-targeted. This lack of transparency and targeting means that the implicit subsidies have a significant opportunity cost. There is, therefore, an opportunity to obtain better value from existing concessional finance sources by making implicit subsidies more transparent and then targeting them more effectively to agreed policy objectives.

This working paper outlined an emerging framework on how to make capital subsidies more transparent and provide a basis for better targeting. Specifically, the paper suggested:

1. Quantifying the implicit subsidy
2. Disclosing the subsidy
3. Defining policy objectives
4. Designing the subsidy mechanisms to achieve policy objectives

The shift from concept to reality will inevitably result in many practical challenges. This paper highlights some examples of these, particularly when concessional finance is fully separated into an equivalent loan on commercial terms and grant components. However, the separation model provides the greatest opportunities to use the subsidies in the best long-term interests of the sector. This model allows the introduc-

tion of stronger incentives (e.g. by making the subsidy payments output based) and facilitates increasing amounts of local private sector financing (e.g. by encouraging the commercial component to be sourced in part or wholly from local capital). In addition, the model can be actively managed to allow a planned and gradual evolution of sector financing in a meaningful way (e.g. by changing the level and targeting of the subsidy component).

However, despite the potential benefits of improved transparency and better targeting of capital subsidies, a significant amount of conceptual work remains, particularly in two areas. First, it will be necessary to identify a suitable benchmark rate to calculate subsidies—on which the suggested framework to improved capital subsidy design depends. Second, it will be equally necessary to identify the best institutional mechanisms of transmitting the subsidy and loan on commercial terms.

Finally, this paper does not argue that all concessional finance programs need to be redesigned. However, given the importance of the policy goals, and the amount of implicit capital subsidies currently being deployed, it is evident that disclosing the subsidies and ascertaining how well they are aligned with policy goals would be a beneficial development for concessional financing in the water sector.

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