

Capital Financing for Municipal Infrastructure: Choices as Viewed by the Enterprise and the Investor¹

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INTRODUCTION

It has become commonplace to estimate the demand for capital to finance infrastructure investments in emerging market countries, and to note that the traditional sources of infrastructure investment capital in these markets – central government budgets and multilateral development agencies – are not adequate to meet the demand. This paper takes as given several starting points:

- the demand for capital to finance urban environmental infrastructure services exceeds the capacity of traditional sources of capital;
- private capital markets, both domestic and international, one way or another will become the major source of investment capital for urban environmental services.

The menu of financing choices that municipal governments and municipal enterprises is rapidly expanding, but there has been relatively little said so far about how to make selections from that expanding menu. Service suppliers (municipal governments, local enterprises such as water authorities) may be able to access private capital markets through a variety of mechanisms - issuing bonds, borrowing from an intermediate financial institution such as a municipal development fund or municipal bank, and securing equity investments in a variety of ways from private investors. But how do the municipal service providers choose from the menu? And how do central governments and local governments, acting together, develop the policy framework to encourage the expansion of this menu of choices?

This paper examines choices among different mechanisms for accessing investment capital. We view these choices from two distinct viewpoints:

- That of the individual service enterprise: which is more attractive to the enterprise, and under what circumstances?
 - debt or equity investment;

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- for sources of debt, borrowing from an intermediary such as a bank or municipal development fund, or direct issuance of bonds?
- That of the investor: what makes debt and equity investments relatively more attractive, or unattractive, from the investor's point of view?

The aim of this examination is to encourage policy makers to consider the decisions they make on policy, and on technical assistance and training, as setting the framework within which municipal governments, municipal enterprises and the capital markets will conduct the transactions that will produce the infrastructure so badly needed. The progression of ideas in this paper begins with the municipal service enterprise facing choices about the amount of financing it needs and choices among different financing methods. The second section then considers how the capital market might react to enterprises that present different financial and operating characteristics. The last section of the paper then introduces the current market realities in emerging market and developing countries, recognizing that there still are intermediate steps to a fully functioning market system for financing urban infrastructure.

THE SERVICE DELIVERY ENTERPRISE

For service delivery providers in Asian urban areas – municipal governments and municipal enterprises – the number one issue is rate of growth. Less than 100% population coverage and service population growth rates should be driving utility managers to focus most of their attention on how to increase the level of services -- how to finance growth. What is the “best” rate of growth an enterprise should strive to achieve? Grow too slowly (a growth rate less than the financial and management capacity of the utility) and several adverse consequences occur:

- Potential customers are needlessly delayed in getting service;
- Ultimately the city may lose competitive economic advantage to other urban areas that are more successfully meeting customer service demands;
- Utility managers may be replaced by others who can leverage the utility’s resources to grow at faster, but sustainable rates.

Grow too quickly (a growth rate that exceeds the utility’s financial and management capability) and several different adverse consequences may occur:

- The utility may be unable to meet its debt service requirements, or be unable to generate an adequate return on investments sufficient to attract investors;
- The utility may be unable to devote enough attention to operations and maintenance issues, causing deterioration of the physical asset base.

- The utility may pay too much for capital.

What are realistic growth possibilities? To grow at the optimal rate, the utility needs to optimize its use of different financing options. Service delivery utilities such as solid waste, water and wastewater, public transportation systems, and so forth have four basic sources of capital to manage in order to sustain growth:

- Retained earnings (the excess of revenues over operating costs after taxes)³;
- Debt (borrowed capital);
- Equity (owners' capital); and
- Contributed capital (grants, gifts)

One useful way to evaluate the choices among these four sources is to calculate what some strategy consultants call the *sustainable growth rate*.⁴ What is the growth rate the utility can sustain over a long period of time without suffering the adverse consequences of growing too quickly or not growing quickly enough?

Sustainable Growth Rate

Strategic financial planning consultants have invented a variety of formulations that help conceptualize, and measure, the maximum rate of growth a business can sustain – the *sustainable growth rate under defined conditions*. This notion basically says that your sustainable growth rate depends upon:

- Your current profit percentage (your ability to use profits to purchase new assets);
- Your interest and dividend payouts;
- Your access to more debt; and
- Your access to more equity

These concepts can be represented in the simple formula:

$$G_{rowth} = r_{etained\ earning\ rate}[R_{eturn\ on\ capital} + d_{ebt\ to\ equity\ ratio}(R - i_{nterest\ on\ debt})] \text{ where}$$

r retained earnings rate is 1.00 minus the percentage of profit paid out in dividends

³ Some countries tax profits earned by publicly owned, municipal enterprises.

⁴ We use the formulation from Levin, Richard. *Strategy in a Nutshell* (Prentice Hall, Englewood Cliffs, NJ, 1992) which is a variation on the Boston Consulting Group's formulation.

(in other words, the percentage of profits *not* paid out)

R is the after tax return on total capital (net revenue/total capital)

d is the ratio of outstanding debt to equity

i is the interest rate paid on current debt

The sustainable growth rate formula expresses how fast the utility can grow, if *none* of those variables change. It says:

- “*if* your current profit percentage (return on sales) doesn’t change, and
- *if* you don’t increase your leverage (borrow more money), and
- *if* you don’t change the percent of after-tax profits you pay out as dividends, and
- *if* the interest rate on your current debt doesn’t change, and
- *if* your asset turns (total sales/total assets) ratio doesn’t change, then

there is a maximum rate at which you can grow without coming apart financially.”⁵

Table 1 following illustrates computations with two water utility examples -- Davao, Philippines and the Surabaya, Indonesia water authority (PDAM) -- the latter under two circumstances, one in which the utility retains its net income without paying a dividend to the city of Surabaya, and one in which the PDAM pays half of its net income to the city, retaining the other half for investment (see row 11, net income retention rate).

Additional information, other than sustainable growth rate data, enables us to consider what some of the alternatives are for these utilities to increase their growth rates. For Davao and Surabaya, under the assumption that they have no dividend payouts (all net income can be retained by the utility for investment), without making any changes, the maximum sustainable growth rate is approximately 13% and 14% respectively. In other words, if none of the variables change, these two utilities can grow at only 13% and 14% annually.⁶ In contrast, if the city of Surabaya insists on the PDAM paying half its net income to the city, then the water utility can grow at just under 7% per year. How would these utilities grow at a considerably faster rate? Basically, there are four choices:

- increase profits (and hence retained earnings)
- borrow (increase leverage)

⁵ *Strategy in a Nutshell*, p. 111.

⁶ Growth is measured as revenue growth.

- get more sales out of existing assets (improve asset turnover)
- increase equity (while reducing the dividend rate)

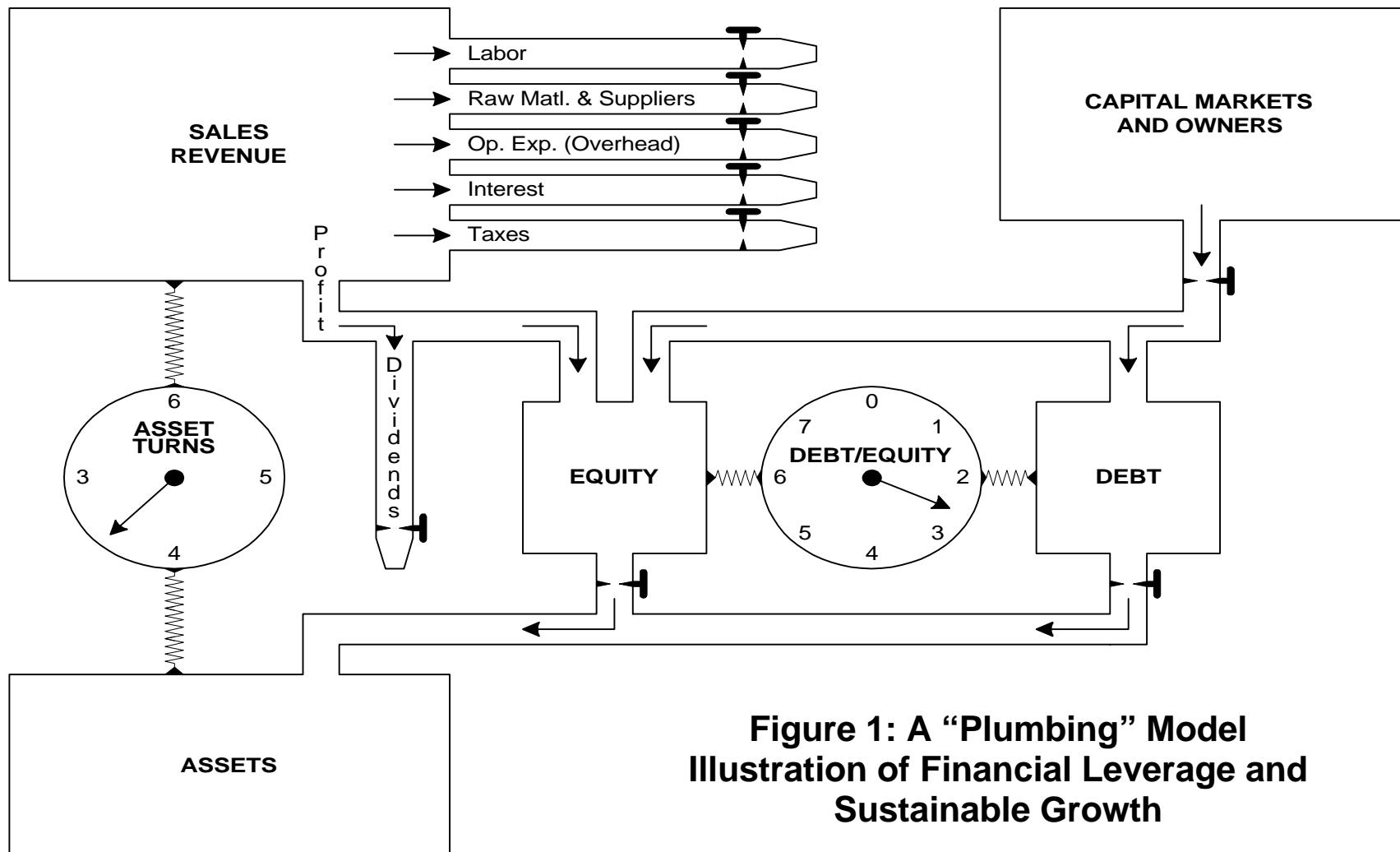
Table 1: Illustrative Sustainable Growth Rate Calculations
(all figures are in local currency-- Philippine Pesos and Indonesian Rupiahs)

		Davao	Surabaya	Surabaya
		1	2	
1	Debt	136,462	23,268	23,268
2	Equity	72,336	64,002	64,002
3	Total Sales (revenue)	170,152	40,394	40,394
4	Total Capitalization	208,798	87,270	87,270
5	Total Assets	240,558	99,458	99,458
6	Interest Rate on Current Debt	12.00%	7.75%	7.75%
7	Net Income before Taxes	25,669	13,550	13,550
8	Net Income after Taxes	25,669	10,626	10,626
9	Return on Assets	10.67%	13.62%	13.62%
10	Return on Equity	35.49%	21.17%	21.17%
11	Net Income Retention Rate	1.00	1.00	0.50
12	Debt/equity ratio	1.89	0.36	0.36
13	After Tax Return on Capitalization	12.29%	12.18%	12.18%
14	Return on Sales	15.09%	26.31%	26.31%
15	Asset Turns (sales/assets)	70.73%	40.61%	40.61%
	Sustainable growth rate	12.85%	13.79%	6.89%
	11*(13+12*(13-6))			

Financial Leverage: A “Plumbing” Model of How Leverage Works

Using the data from Table 1 and a basic financial model of an enterprise, we can illustrate the choices enterprises might make among financing alternatives. The concept of a sustainable growth rate and the factors that affect it introduce a simple way to characterize the financial operations of an enterprise, such as a public service delivery enterprise, while focusing on the growth objective. On the following page, these different components are illustrated in an analogue diagram of a utility operation. Figure 1 helps focus on the leverage points available to the enterprise.

At the bottom left of the diagram is the *objective* – increase assets in order to increase the delivery of services to a potential customer base that at present is not completely serviced and is growing rapidly. Assets can be increased only through increased debt or increased equity investments. Increased equity in turn is a function of retained earnings (after tax profits that are not paid out in dividends) and owners’ (present and new) investments. Presumably, owners



invest with the expectation of a return on their equity, although we also can think in the case of public service enterprises of contributed capital from government with no expectation of return as an equity investment (such as a grant from central government).

The other elements in the diagram illustrate the relationships among the utility's operations and the components of capital financing. Additional assets, which mean serving more customers, mean additional sales. The efficiency with which those assets produce service delivery, and produce the capital necessary for future operations, is illustrated in the upper left side of the diagram. If the utility can improve the efficiency of its operations, by reducing the costs of labor, materials and supplies, indirect operating costs such as administrative overhead, then greater operating income is possible which in turn yields equity capital and/or dividends. The critical efficiency relationships in Figure 1 are the asset turns (how much sales can you generate from existing assets?) and operating expense outflows.

The relationships between capital financing sources (capital markets and owners) is reflected in the debt to equity "gauge," which is a key measure of the extent to which the utility can undertake more leverage through debt, and the relationship between dividends and equity, which illustrates how attractive the utility is to equity investors.

Consider the data from Table 1 for Davao and two different scenarios for Surabaya water enterprises. Where do these enterprises have leverage, and how can they exploit that leverage?

Increase profits. Profitability, measured as return on sales, is high for both utilities, but especially high for Surabaya, at over 26%, which might cause us to question if any additional profits could be squeezed out of the utility. Since Indonesian utilities may be required to turn over to the municipality a portion of profits, an increase in profits may lead to insistence on that. The second illustration of Surabaya, which assumes that half the net income is paid over to the city, shows a dramatic impact on the utility's ability to grow. Further, an increase in profitability is likely to have a negative impact on these utilities' attempts to raise water rates.

Increase leverage. Both utilities have very low debt to equity ratios, indicating that there is considerable room for each of them to increase their capital financing through borrowing. From these two utilities point of view, increased debt is a highly attractive alternative since their financial condition should be evaluated quite positively by any potential lender.

Increase asset turnover rate. The asset turnover rate is a fancy word for how much sales revenue you can generate from your asset base, which in the case of capital intensive infrastructure services consists primarily of fixed assets. Neither Davao nor Surabaya show an exceptionally high asset turnover rate, although for public utility operations both are acceptable. Increasing sales for the existing assets means increasing revenues through tariff increases or decreasing operating costs through more efficient operations. Either of those measures in turn generates higher retained earnings, or enables the utility to meet higher debt service costs without reducing retained earnings. For water utilities, reducing unaccounted for water losses is the quickest way to increasing the asset turnover rate.

Increase equity. Increasing equity is the final option. Both utilities presently are exhibiting excellent returns on equity, with Davao an unusual 35% return, although Surabaya's return on equity in excess of 20% also is exceptional for water utilities. One suspects that this may be a reflection of the methods of accounting for equity since both are public water authorities with no equity owners in the conventional sense of equity investors expecting to earn a return on their shares. If either utility were to undertake raising equity, such as either through privatization (sale of assets) or through a joint venture with a private party to acquire new assets (such as a build-operate-transfer facility), the utility of course then would be paying out dividends to those investors. Assuming the utility could generate the same return on equity investment that it is now, Davao particularly could undertake to raise equity, pay a handsome return that is nevertheless less than the current 35% return, and still have a healthy balance of retained earnings for additional investment and/or capital reserve.

More generally, for most municipal enterprises in emerging market economies, debt financing is the most attractive capital source as long as the cost of debt is less than the return on equity that would be required by owner/investors. In addition, lenders exercise considerably less control over operations than equity investors. The situation that most emerging market utilities are in favors debt, first because debt is generally available at less than the market cost of capital, and second because of the scarcity of equity investors. Public sector loan funds from such institutions as municipal loan agencies typically are at below market rates of interest. Private investors, on the other hand, view a utility investment in light of other opportunities which will return a market rate of return. If the utility does not pay a risk adjusted rate of return equal to other private opportunities, then equity capital generally will not be available to the utility. Hence, under current conditions, most utilities will prefer debt financing.

Under what circumstances will a utility prefer equity over debt financing? In principle, as an enterprise becomes more highly leveraged with debt (illustrated by an increasing debt to equity ratio and increasing debt service costs as a proportion of operating expenses), the costs of debt to the enterprise will increase since the risk of delayed payments or failure to pay increases. In practice, however, public service enterprises in emerging markets are eligible for the same cost of debt capital regardless of their financial condition, as long as public sector lending institutions have sufficient capital. Municipal development funds, for example, charge the same interest rate for all borrowers, although in some countries different sectors have different interest rates, but uniform across all borrowers within a sector. There is some rationale for implicit subsidies in the loan rates charged by these funds, especially when the subsidy is the central government's assumption of exchange risk brought on the fact that the domestic capital market is not yet deep enough to supply domestic capital. However, over time, either public sector lending institutions will have to raise their own capital in the market, and hence pay market costs, or service utilities will have to raise their own capital directly, such as borrowing from banks or issuing bonds.

Figure 2 illustrates the hypothetical relationship between the cost of debt and the cost of equity. For a firm with low leverage (low debt to equity ratio), the total cost of capital can be lowered by increasing debt relative to equity. At some point, which varies by type of

industry/market, the debt to equity ratio threatens the probability of debt repayment, which causes lenders to charge a higher premium for additional debt. In that region, it is generally preferable for the enterprise to substitute more equity for debt. For most emerging market public utilities, however, financial leverage strongly favors debt financing.

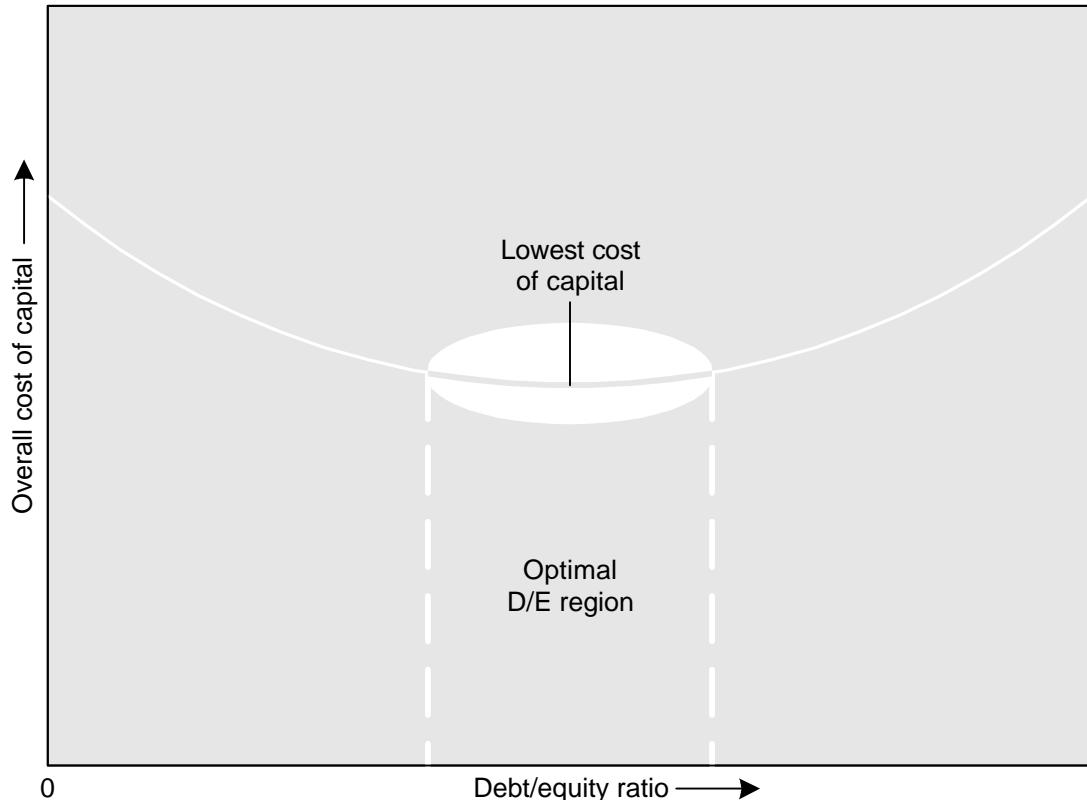


Figure 2: Optimal Debt-to-Equity Region for an Organization

Source: Herbert T. Spiro, *Finance for the Nonfinancial Manager*, 3rd ed., 1988.

Technology and Management Leverage

Although the focus of this paper is on financing alternatives, it is important to remember that two other elements may influence the choice of debt versus equity. To the extent that private equity investment also brings new technology and new management tools to the utility's operations, the impact on operations cost and hence profits which may be reinvested, or paid in dividends, may offset the likely higher cost of equity financing. Recall from Figure 1 that the flow of revenue from sales into equity and dividends is affected by the efficiency with which assets produce sales. If private capital investment such as in the form of concession contracts brings with it management and/or technology improvements, the proportion of sales revenues that are operating expenses will decrease, and the flow of profit to dividends and equity will increase.

THE CAPITAL MARKET POINT OF VIEW

The preceding section focused on the points of leverage that affect a service delivery enterprise's preferences for debt versus equity financing. In this section, we flip the observation point of view to the investors. How does the market view the enterprise? Whether debt or equity, investors expect a return on their investment commensurate with risk and the various opportunities the market presents for their investments. Generally, there are two basic types of risk – business and financial. An investor looking at a public service enterprise, such as a water utility, has to evaluate the risks the utility faces in its business environment and the internal risks posed by that utility's financial condition.

In general, business risk for utilities is lower than for many other industries. That is, changing economic conditions do not significantly affect the consumption of a water utility's services, and the price per unit of service is generally not a large proportion of the consumer's household or enterprise budget, and hence customers will generally be able to pay under adverse as well as under favorable economic conditions. Investors therefore generally evaluate a utility's business risk as lower than other enterprises whose situation is much more volatile under varying market conditions.

Ratio Analysis of Financial Characteristics

Financial conditions of utilities, however, can vary greatly, and thus investors, unless they are government agencies that charge the same cost of capital to all borrowers regardless of their financial condition, will vary the costs of capital considerably. We can illustrate the type of analysis of financial and operating conditions that investors will look at with four different water utilities from the Philippines. In research conducted for USAID/Philippines, we collected financial data on four water utilities to assess the extent to which water districts can convince private sector lenders and investors that reasonable returns on investments in water or wastewater projects can be had, without promising returns that would ultimately damage the financial health of the utilities involved or lead to exorbitant profits for the private sector at the public's expense.⁷

We used a series of ratios to structure and display information obtained from audited financial statements and other documents supplied by the utilities.⁸ The ratios describe the financial and operational health of these utilities, help assess the feasibility of the utility's current capital financing plans, and provide basic guidance in selecting among different types and sources of private sector financing that seem most appropriate for each utility. In and of themselves, quantitative data on a utility's revenues, expenses, or debt mean very little. The data start to become informative when they are compared with other data from the utility, in the form of ratios, when changes in ratios over time are examined, and when ratios are compared with those of other

⁷ Johnson, Ronald, James Leigland and Stephen Pereira, "Stimulating Additional Financing: Philippines Water and Wastewater Projects," Final Report to U.S. Agency for International Development, February 1996.

⁸ Note that some of the ratios for Davao in the following analysis differ from those in the preceding section. The sustainable growth rate model uses a debt to equity ratio, whereas in the Philippines water utility study, we used another common ratio, also referred to as debt to equity which is the proportion of debt in the total of debt and equity.

utilities. In countries with highly developed capital markets, median ratios for entire populations of various types of business, including utilities, are used by investors to gauge financial and operational health of individual utilities and to rate their credit-worthiness.

Table 2 displays the 12 ratios used in this study; it also shows averages for the four water districts examined and comparison points from other countries. These particular ratios have been tested in other countries by investors and international donor agencies, and used recently in Indonesia, where private sector financing of water and wastewater operations are also under consideration. Many of these ratios are commonly used in countries with highly developed capital markets. The ratios included the following:

- **Debt Management Ratios:** These ratios assess the debt burden carried by a utility. They are probably the indicators most widely used by investors of all types, but are of particular importance to new lenders (international donors, commercial banks, bond buyers) who are concerned with determining the continuing creditworthiness of a utility -- its ability to make timely debt service payments over the lifetime of new loans or debt issues.
 - Debt to Equity is one way of appraising the ability of an enterprise to take on new long-term financing--the higher the percentage of long-term debt in the total capitalization of the enterprise, (long term debt, retained earnings, reserves, and contributed capital) the more highly leveraged is an enterprise, and the less flexibility it has in servicing new debt.
 - Debt Coverage is the most widely used indicator of creditworthiness--the higher the coverage of annual debt service (principal plus interest) by annual system net revenues, the better the credit quality.
 - Interest Share of Operating Income is another measure of how spending flexibility is affected by outstanding debt--this time the focus is on interest obligations alone.

Table 2: FINANCIAL AND OPERATING RATIO INDICATORS

NAME	DEFINITION	PHILIPPINE SAMPLE AVERAGES*	INDONESIAN SAMPLE AVERAGES**	LATIN AMERICA SAMPLE***
DEBT RATIOS:				
1. Debt to Equity	Long-Term Debt/ Total Capitalization (L-T Debt +Eq.)	65%	43%	64%
2. Debt Coverage	Net Operating Income/ Annual Debt Service	1.6	2.1	1.5
3. Interest Share of Operating Income	Interest Payments/ Operating Income	20%	7%	N/A
EFFICIENCY RATIOS:				
4. Revenues per Cubic Meter Sold	Operating Income/ Cubic Meters of Water Sold	\$0.32	\$0.24	\$ 0.25
5. Accounts Receivable Turnover	Accounts Receivable/ Average Daily Sales	68 days	131 days	60 days
6. Expenditure per Cubic Meter Sold	Operating Expenses/ Cubic Meters of Water Sold	\$0.25	\$0.22	N/A
7. Working Ratio	Operating Expenses (before Depreciation)/ Operating Income	66%	59%	62%
8. Employees per 1000 Connections	No. of Employees/ 1000's of Connections	9	11	6.8
9. Unaccounted for Water	Metered Prod. - Met. Sales/ Metered Production	33%	22%	20%
10. Current Ratio	Current Assets/ Current Liabilities	2	2.5	3.4
PROFITABILITY RATIOS:				
11. Return on Sales	Net Income (after taxes)/ Operating Income	9%	22%	N/A
12. Return on Assets	Income (before int. & taxes)/ Total Assets	10%	10%	N/A

* 1992-94 averages from the four Water Districts visited as part of this study.

** 1990 averages for 4 well run utilities (PDAMs) in Indonesia.

*** 1990 averages of a sample of well run utilities in Latin America.

- **Operating Efficiency Ratios:** These ratios are indicators of management quality, particularly the ability of managers to control costs and collect receivables. As such they may signal requirements for funds that might not be obvious in standard analysis of balance sheets and income statements, or suggest opportunities for increasing profitability.
 - Revenues per Cubic Meter Sold should remain at least constant in real terms or increase in nominal terms as a system expands. If not, problems with collections and billings or tariffs may be to blame.
 - Accounts Receivable Turnover indicates the average number of days required to convert receivables to cash. As such, it reflects management's efficiency in collecting receivables and in applying the utility's credit policy.
 - Expenditures per Cubic Meter Sold is a rough measure of production costs and reflects the degree of spending flexibility available to the utility to respond to changing economic and social conditions. The closer this ratio is to Revenues per Cubic Meter Sold (see above), and the faster it increases above inflation rates, the less productivity and spending flexibility is possessed by the utility. "Operating margin" is the term used to refer to the difference between revenues and expenditures per cubic meter of water sold.
 - Working Ratio essentially expresses the comfort margin between annually recurring costs and revenues. A utility that must rely on non-recurring, non-operating revenues is a potentially weak credit subject.
 - Employees per 1000 Connections is a straightforward indicator of labor productivity as well as the quality of personnel management.
 - Unaccounted for Water is difficult to measure accurately, for many reasons, but is an important indicator of metering errors, leaks, and unauthorized use. Non-revenue water, the percentage of water for which revenues are not collected, is easier to measure and often substituted, but it mixes together water lost through physical leakage and theft, water billed but not collected, and water deliberately provided for no revenue such as for fire hydrants.
 - Current Ratio (also known as the Liquidity Ratio) is a common measure of short-run solvency, the ability of an enterprise to meet day-to-day operating and maintenance expenses.
- **Profitability Ratios:** These ratios provide a basis on which to make judgments about the probable long-term financial value of these enterprises, particularly their ability to generate funds for reinvestment and growth and/or owners' dividends.

- Return on Sales indicates the size of the operating margin the utility has on the volume of water sold (after all non-operating as well as operating costs have been deducted), and thus suggests the volume of sales that must be achieved in order to gain an adequate return on investment.
- Return on Assets indicates the earning power of a utility's assets, and serves as a rough approximation of the rate of return concept used in the economic analysis of projects.

Shrewd investors and analysts examine all of these ratios, and more, but they pay different degrees of attention to different types of ratios depending on what kinds of participation they are contemplating. Consequently, types of ratio profiles are more or less consistent with specific types of private sector involvement in water district financing activities. For example, potential creditors of all kinds would begin by analyzing debt ratios to assess the capacity of the enterprise to carry additional debt. Commercial bankers, more likely interested in making short-term loans to utilities, would also look carefully at short-term cash flow indicators, such as the Current Ratio, to try to gauge the current ability of a utility to meet debt obligations. Potential bondholders would also look at the debt ratios and debt coverage to gauge the ability of a utility to meet debt obligations over the long term.

For potential equity investors, on the other hand, the critical consideration would be profitability, with secondary consideration given to debt utilization and liquidity. In cases where private investors are considering minority ownership shares in enterprises, in which government ownership maintains majority control, they would certainly focus on profitability, but would also look for a manageable debt burden and reasonably strong management efficiency. In cases where investors are considering majority ownership, perhaps through direct acquisition of assets, they might be attracted by opportunities to improve profitability by increasing management efficiency, but would be wary of inheriting heavy debt burdens.

From the perspective of utilities with acute capital investment needs, choices based on their own ratio profiles are relatively straightforward. If debt burdens are low, utilities are usually interested in additional borrowing. This is especially true if capital can be borrowed at terms that match the lifetimes of the facilities to be constructed. Long-term bonds are of course ideal for this purpose, and typically less expensive overall than private participation arrangements. Where debt burdens are already high, or where the technical and managerial requirements of planning, building, and maintaining the improvement are beyond the capabilities of the utility, more expensive kinds of private participation, such as BOT arrangements, are warranted.

Annex 1 provides three years information on these ratios for four Philippine water utilities. Davao's is replicated here to illustrate the investors' uses of these ratios in thinking about debt and equity investments.

Debt Management. DWD's debt indicators are exceptionally strong. Debt has made up a low, and decreasing, percentage of total capitalization. Operating income substantially "covers" debt service costs, and the interest share of operating income is by far the lowest among the utilities visited. All of these indicators easily meet rules of thumb for desirable performance, as used by multi-lateral funding agencies such as the World Bank. The utility's performance is in part the result of a formal debt management policy that aims at exceptional prudence: debt service payments are required by the policy not to exceed 20% of operating revenues.

Operational Efficiency. DWD's efficiency indicators are also exceptionally strong. The operating margin between revenues and expenditures per cubic meter of water sold is small but steady, and more than sufficient to meet low debt service requirements. The average period required for accounts receivable turnover is the shortest among the districts visited, suggesting strong billing and collection procedures and policies. The high, and increasing, working ratio suggests that O&M expenses are climbing, which is a cause for some concern. However, the utility seems to be using intensified maintenance activity to address unaccounted for water issues. If this is the case, then the trade-off between higher O&M costs and exceptionally low rates of unaccounted for water is producing large benefits for the water district and its customers. The low number of employees per connection suggests a sound approach to personnel management. Finally, the current ratio has more than doubled since 1992, reflecting the utility's growing health, but also reflecting perhaps the need to adopt more sophisticated cash management procedures to identify appropriate uses for the utility's high liquidity.

Profitability. DWD's profitability indicators are moderately strong. Its return on sales is acceptable and consistent with the ratios discussed above, but recent declines here raise the question of whether or not the utility is pursuing rate increases sufficient to keep future capital costs to a minimum. Similarly, return on assets is acceptable, but also declining. Shrewd investors would focus on the utility's willingness and ability to keep rates at reasonable levels.

Table 3: Water District Davao

INDICATORS	1994	1993	1992
	UNAUDITED	AUDITED	AUDITED
I. DEBT STRUCTURE			
1. DEBT EQUITY RATIO	57%	59%	65%
2. DEBT SERVICE COVERAGE RATIO	1.8	1.7	2.1
3. INTEREST SHARE OF OP. INCOME	8%	9%	11%
II. EFFICIENCY			
1. OPERATING REVENUES PER M3	6	6	6
2. ACCOUNTS RECEIVABLE TURNOVER RATIO	54	59	42
3. OPERATING EXPENDITURES PER M3	5	5	5
4. WORKING RATIO	73%	65%	61%
5. EMPLOYEES PER 1000 CONNECTIONS	7	7	6
6. UNACCOUNTED FOR WATER	20%	20%	25%
7. CURRENT RATIO OR LIQUIDITY	5.2	2.3	2.1
III. PROFITABILITY			
1. RETURN ON SALES	11.66%	10.27%	15.09%
2. RETURN ON ASSETS	12.84%	12.07%	16.03%

Conclusions. DWD's extensive debt carrying capacity and solid efficiency indicators make a compelling argument for using additional debt financing to meet its capital improvement needs.

The utility would undoubtedly be attractive to a variety of lenders and investors, and is in a position to choose from among the least expensive alternatives. However, equity investors might be less attracted to a utility that has only moderate profitability indicators despite such low debt and strong efficiency indicators. There appears to be little room here for a quick return on equity investment via management improvements. But since borrowing is typically less costly than various forms of public private partnership, at least for relatively unsophisticated projects such as water supply facilities, DWD would probably not be advised to enter into BOT arrangements, or other forms of privatization, regardless of investor interest. In a fully developed capital market, where subsidized loan funds were not available, DWD would be a likely issuer of long-term revenue bonds. Some of the other utilities, analyzed in Annex 1, show promise of

rapid profit improvement possibilities through management changes, and thus might be more attractive to equity investors.

Capital Market Conditions

The preceding discussion treats Davao Water District under the assumption that the capital market is well established and there are no artificial circumstances, such as a subsidized loan program competing with private capital market possibilities. Circumstances today in the emerging market countries of course do not include fully functioning capital markets, and there are various programs that have been established to finance long term investments that may, or may not be compatible with the development of capital market mechanisms. In the specific instance of Davao, for example, the Local Water Utilities Administration, a Philippine central lending institution for water districts, in 1995 offered Davao Water District a Pesos 700 million loan to meet its capital financing needs, according to some observers in order to discourage Davao from looking at private capital market debt and/or equity alternatives.

Table 4 summarizes issues that currently affect the ability of private capital markets in most emerging market countries to be the main source of debt and equity financing for urban infrastructure services. These issues are categorized as *general capital markets* issues and *investor specific* issues. Some of them are specific problems for either investors or borrowers, and some are features that, were they present in the capital market, would make long-term debt and equity investments in projects like water and wastewater, solid waste, and public transportation easier and more attractive.

Debt Instruments. At this stage of development in most of the capital markets in this region, few long term debt instruments of any kind exist. Central governments issue short term treasury bills, and are gradually lengthening the term; five year T-bills have recently been issued in some countries, and up to ten may be issued soon. Banks and other financial institutions invest in these central debt instruments. In addition, banks and other financial institutions issue lines of credit, extend loans for periods up to seven years, and government finance institutions extend some loans for up to ten years. There are increasing numbers of corporate bonds and other commercial paper being traded on the markets in the region.

There also are the beginnings of municipal bond issues by water utilities. In the Philippines there has been one municipal bond issue, a Cebu provincial issue, that provided seven year financing for a commercial facility (shopping center); that bond is convertible to shares in the commercial property, which is valued at several times greater than the face value of the bond. Several other Philippine local governments are in various stages of preparing bond issues to finance facilities such as transport terminals and markets. Water utilities in Indonesia are negotiating with underwriters for the first municipal bond issues in that market. Generally, however, there are few debt instruments of any type, and no existing long-term (fifteen or more years) debt instruments in the capital market.

Table 4: Constraints and obstacles in the private capital markets

	Capital Markets Issues	Investor Issues
Lack of suitable long term debt instruments	✓	✓
Lack of sufficient underwriting or other institutions to create debt instruments, to securitize, or otherwise package long-term debt	✓	
Lack of long-term government debt or other benchmarks	✓	
Lack of secondary market facilities	✓	
Lack of suitable credit rating or other credit-worthiness information	✓	✓
Lack of knowledge or understanding of the water and wastewater sector		✓
Lack of prior experience with recourse mechanisms and other risk management strategies for long-term, revenue-backed debt		✓

This lack of suitable long-term debt instruments is both a general capital markets development issue and a specific issue to potential investors. Investors who may have funds they are willing to invest in longer-term debt find few mechanisms available. This puts the investor in the position of evaluating single, large projects as possible long-term financial investments, which potentially puts too much of an investor's capital into only one or a few investments. An investor such as an insurance company cannot commit significant portions of their funds to single projects. Similarly, banks issuing longer-term notes to borrowers, corporate or public, have little or no choice but to hold those notes since there are no ready instruments or means by which the asset represented by the borrower's repayment obligation can be converted into a tradable instrument. That constrains municipal governments and enterprises' ability to raise capital to finance large, long-term projects. With few precedents from either the corporate or public sectors, municipalities and investors wishing to issue debt instruments backed either by pledged revenue streams from the project or by the general revenue resources of the municipality have no examples on which to rely.

Underwriting, Securitization. Closely related to the lack of suitable existing debt instruments is the limited involvement of financial institutions in underwriting large, long-term debt, or in performing other forms of securitizing long-term debt. A large, visible project, such as

the concession contracts being discussed for the Metropolitan Manila Water system and the Jakarta water system (in two parts) and some projects contemplated in India and Thailand, or perhaps a water source development project for Cebu, Philippines, may be successful in attracting large financial institutions from within domestic capital markets to play an underwriting role through essentially private placements. However, these same projects are of a size sufficient also to attract more experienced financial institutions from other countries. For example, although few details are available, it appears that there are at least two serious consortia interested in the Cebu water source development project, both from Malaysia, and that these two investment groups would be arranging their own, offshore financing.

Benchmarks and Secondary Market Facilities. The last two general capital markets issues are the lack of other types of long-term debt such as long-term government bonds to serve as benchmarks for other long-term debt issuers (and investors) and the lack of secondary market facilities through which investors in long-term debt can buy and sell such debt. In highly developed capital markets, long-term government debt, such as U.S. 30 year treasury bonds, serve as a benchmark indicator of the value at any point in time investors place on long-term debt. The yield on a long-term, “safe”⁹ investment such as a long-term central government bond gives issuers of new debt a benchmark against which to price the new debt issue and investors a benchmark against which to evaluate the new issue versus an existing option. Closely related is the ability of existing investors to sell long-term debt they are holding in a secondary market.

There is some argument as to the necessity of developing long-term central government debt instruments to serve as a benchmark versus the potential for a large private capital market participant to “make the market” by pricing and purchasing a sufficiently large quantity of long-term debt that a benchmark in effect is created. So far, the current state of capital markets in this region is that there is no one private party willing or able to play a market-making role. The only existing benchmarks, therefore, are the long-term loans issued by central government agencies such as the Local Water Utility Administration in the Philippines and the Regional Development Account in Indonesia. However, neither of these two serve as adequate benchmarks since in the case of LWUA loans the “price” (interest rate) is influenced by the practice of mixing the Administration’s equity capital and concessionary financing from some agencies such as OECF with other capital to loan at concessionary prices. RDA loans are also concessionary in that the primary source of capital, external donor loans, carry a foreign exchange risk component which the central government absorbs and the business and financial risks of borrowers are largely ignored in RDA loan pricing.

Credit Ratings, Credit Worthiness. Many water districts and some cities in the region have some experience with debt and thus have credit histories. To some extent, this existing credit history can serve as some evidence of the borrower’s ability to manage debt. However, no formal system of credit ratings or other standard mechanisms which use a common methodology to establish the credit worthiness of a municipal borrower exist. This in itself does not preclude evaluating the credit risk of a potential borrower, but it does mean that each potential investor or

⁹Safe, meaning very little or no risk premium is attached to the debt by the investor.

investment group has to develop its own credit information requirements and standards for assigning risk, which increases the cost of debt capital.

In work with the Philippines water utility information, we observed that the audited financial statements and other information readily available on water districts provide adequate disclosure to enable analysis of financial and operations quality and credit risk. However, this is more the exception than the rule. Considerable work on improving the financial statements for municipal governments and enterprises is necessary. In many emerging market countries, there still are no uniform reporting and disclosure requirements that are aimed specifically at revealing the financial position of the entity on which investors could rely. This lack of standard credit rating information and/or a credit rating agency or service increases the cost of borrowing in that the work that investors have to do on an ad hoc basis to assess the credit risk in a particular borrowing is passed on to the borrower.

Understanding of Municipal Services and Experience with Risk Management. Private capital market participants in this region, lacking experience in water and wastewater projects and other municipal projects, naturally are more reluctant to consider long-term lending for those projects than for more familiar, and shorter-term, commercial ventures. Water supply and distribution projects, under the supervision and control of water districts in most cases, depend entirely on the revenue stream from the project for the source of funds to repay investors. Commercial debt is secured by the borrower, and there typically are capital assets pledged by the borrower as security.¹⁰ Wastewater projects, which are few, typically do not generate by themselves sufficient revenue to pay the costs of financing and operations.

CONCLUSIONS

An increasing number of local government revenue producing enterprises in emerging market countries are attractive to private debt and equity investors. Capital market conditions in most of the countries, however, are still immature. Central government sponsored credit institutions such as municipal development funds and banks offer hope of stimulating both a broader and deeper capital market. However, to achieve the “market making” effects of these funds and banks, they should increase their own application of market principles in their lending decisions. So far these loan funds and development banks do not differentiate among borrowers the same way private debt and equity investors would. The same cost of capital, usually with little or no risk premium, is charged to all borrowers. This underprices investment capital and makes it difficult for interested private investors to enter the market. Further, those municipal enterprises that would be most attractive to private investors typically are the first targets of central

¹⁰In both mature and emerging capital markets, there is a growing volume in securitizing revenue streams such as receivables (e.g., the revenue stream from credit card debt) as the collateral against a debt financing. As these securitizations of revenue streams become more common, and therefore more familiar, the securitization of revenue streams from water supply and other revenue producing enterprises will seem less novel.

government loan programs. To help make a market in municipal infrastructure investments, central government loan funds will have to apply market discipline to their operations and will have to secure their own financing from the private capital market.

**Annex 1: Illustrations of Financial and Operating
Ratio Analyses of Water Enterprises**

WATER DISTRICT DAVAO			
INDICATORS	1994	1993	1992
	UNAUDITED	AUDITED	AUDITED
I. DEBT STRUCTURE			
1. DEBT EQUITY RATIO	57%	59%	65%
2. DEPT SERVICE COVERAGE RATIO	1.8	1.7	2.1
3. INTEREST SHARE OF OP. INCOME	8%	9%	11%
II. EFFICIENCY			
1. OPERATING REVENUES PER M3	6	6	6
2. ACCOUNTS RECEIVABLE TURNOVER RATIO	54	59	42
3. EXPENDITURES PER CUBIC METER	5	5	5
4. WORKING RATIO	73%	65%	61%
5. EMPLOYEES PER 1000 CONNECTIONS	7	7	6
6. UNACCOUNTED FOR WATER	20%	20%	25%
7. CURRENT RATIO OR LIQUIDITY	5.2	2.3	2.1
III. PROFITABILITY			
1. RETURN ON SALES	11.66%	10.27%	15.09%
2. RETURN ON ASSETS	12.84%	12.07%	16.03%

WATER DISTRICT CAGAYAN DE ORO			
INDICATORS	1994	1993	1992
	UNAUDITED	AUDITED	AUDITED
I. DEBT STRUCTURE			
1. DEBT EQUITY RATIO	61%	61%	70%
2. DEBT SERVICE COVERAGE RATIO	2.0	1.4	1.4
3. INTEREST SHARE OF OP. INCOME	13%	19%	23%
II. EFFICIENCY			
1. OPERATING REVENUES PER M3	7	6	5
2. ACCOUNTS RECEIVABLE TURNOVER RATIO	95	73	107
3. EXPENDITURES PER CUBIC METER	5	4	4
4. WORKING RATIO	67%	69%	69%
5. EMPLOYEES PER 1000 CONNECTIONS	8	7	7
6. UNACCOUNTED FOR WATER	33%	33%	26%
7. CURRENT RATIO OR LIQUIDITY	3.4	2.5	2.1
III. PROFITABILITY			
1. RETURN ON SALES	20.10%	11.63%	12.81%
2. RETURN ON ASSETS	16.05%	13.03%	13.78%

WATER DISTRICT ZAMBOANGA			
INDICATORS	1994	1993	1992
	AUDITED	AUDITED	AUDITED
I. DEBT STRUCTURE			
1. DEBT EQUITY RATIO	74%	75%	76%
2. DEBT SERVICE COVERAGE RATIO	1.5	1.3	1.8
3. INTEREST SHARE OF OP. INCOME	27%	31%	23%
II. EFFICIENCY			
1. OPERATING REVENUES PER M3	6	6	6
2. ACCOUNTS RECEIVABLE TURNOVER RATIO	90	66	66
3. EXPENDITURES PER CUBIC METER	5	4	4
4. WORKING RATIO	77%	74%	67%
5. EMPLOYEES PER 1000 CONNECTIONS	11	11	13
6. UNACCOUNTED FOR WATER	44%	43%	45%
7. CURRENT RATIO OR LIQUIDITY	1.1	1.3	1.8
III. PROFITABILITY			
1. RETURN ON SALES	9.68%	10.27%	9.91%
2. RETURN ON ASSETS	2.73%	3.27%	12.70%

WATER DISTRICT CEBU			
INDICATORS	1994	1993	1992
	AUDITED	AUDITED	AUDITED
I. DEBT STRUCTURE			
1. DEBT EQUITY RATION	60%	60%	56%
2. DEBT SERVICE COVERAGE RATIO	0.7	0.4	2.8
3. INTEREST SHARE OF OP. INCOME	34%	36%	9%
II. EFFICIENCY			
1. OPERATING REVENUES PER M3	14	14	14
2. ACCOUNTS RECEIVABLE TURNOVER RATIO	59	60	48
3. EXPENDITURES PER CUBIC METER	11	12	10
4. WORKING RATIO	67%	55%	50%
5. EMPLOYEES PER 1000 CONNECTIONS	10	12	13
6. UNACCOUNTED FOR WATER	41%	39%	31%
7. CURRENT RATIO OR LIQUIDITY	0.6	0.8	0.8
III. PROFITABILITY			
1. RETURN ON SALES	-7.40%	-18.19%	22.81%
2. RETURN ON ASSETS	5.16%	3.16%	5.41%