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FINANCING MECHANISMS FOR CAPITAL IMPROVEMENTS FOR REGULATED WATER UTILITIES

Patrick C. Mann, Ph.D.
NRRI Institute Associate
and
Professor of Economics
West Virginia University

The National Regulatory Research Institute
The Ohio State University
1080 Carmack Road
Columbus, Ohio 43210-1002
(614) 292-9404
www.nrri.ohio-state.edu

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EXECUTIVE SUMMARY

Due to factors that include the needed replacement in many parts of the United States of an aging water distribution infrastructure, compliance with the amended Safe Drinking Water Act, and growing water demands associated with economic development and urban growth, the magnitude of required capital improvements in water supply industry is increasing. Regulated water utilities as well as their regulators face challenges in meeting future capital financing needs. In this context, it is important that regulated water utilities and state regulatory commissions pursue and implement effective financing strategies. The failure to obtain adequate as well as timely capital financing may have a detrimental effect on the overall financial viability of a water utility as well as impede compliance with environmental legislation and impede satisfaction of changing water customer needs. There are many ways to finance capital improvements for water utilities. Two especially interesting ones are system availability charges and system development charges.

This report explores the implications for the financing of capital improvements created by recent trends in the water industry. These trends include the increased emphasis on conservation, the emerging potential for competition in the water industry, increased system bypass, privatization, and consolidation or regionalization. There is also an examination of the equity or fairness issues associated with the capital financing of water supply. Several conclusions can be drawn from this research:

- Regulated water utilities should consider exploring and evaluating alternative financing mechanisms, such as availability charges and system development charges, even though there are serious impediments to adopting these financing mechanisms.

- Several recent trends in the water industry, such as system bypass, wholesale competition, and conservation have important implications for the capital financing of water utilities.

- Regulatory commissions can play an important role in addressing the capital financing problems of regulated water utilities; the commission role can involve both regulatory oversight and the ratemaking process.

In brief, regulators can consider alternative financing methods, while at the same time remain vigilant regarding their application.

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FOREWORD

Water utilities face important challenges in meeting future capital financing needs making it essential that regulated water utilities and their commissions pursue and implement effective financing strategies. This report discusses some financing mechanisms for capital improvements, impediments to effective financing of water supply, regulatory strategies for overcoming these financing impediments, and the role of regulatory oversight in capital financing. The report also examines the implications for capital financing created by recent trends in the water industry. This report should be a valuable resource for commissioners and staff in considering financing options for capital improvements for water utilities under their jurisdiction.

Raymond W. Lawton, Ph.D.
Director
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Introduction to Capital Financing

Due to factors that include the needed replacement in many parts of the United States of an aging delivery or distribution infrastructure, compliance with the amended Safe Drinking Water Act, and growing water use associated with economic development and urban growth, the magnitude of required capital improvements in water supply is increasing. Given the increasing costs of capital improvements, many regulated water utilities face challenges in the financing of system expansion.

As observed by Amatetti, both investor-owned and publicly owned water utilities face uncertain times in meeting future capital needs.[1] The financial challenges are a function of the increasing demand for capital financing by water utilities at a time when the flow of capital from conventional sources of capital financing may be decreasing. Under these circumstances, it is important that water utilities and regulators combine efforts in developing and implementing effective capital financing strategies.[2]

The large investor-owned utilities have little difficulty in obtaining financing. In contrast, small investor-owned utilities have more difficulty but can obtain financing if they are creditworthy and are willing to pay the effective financing rates. Given the different sources of financing available, the issue is more one of intergenerational equity (that is, who pays the financing costs) than one of obtaining financing. The small investor-owned utilities can always obtain financing at a particular capital cost or interest rate; very few investor-owned utilities are completely precluded from the capital markets.

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[1] Edward J. Amatetti, *Meeting Future Financing Needs of Water Utilities* (Denver, Colorado: American Water Works Association Research Foundation, 1993).

[2] American Water Works Association, *Water Utility Capital Financing*, Manual M29, Second Edition (Denver, Colorado: American Water Works Association, 1998).

In brief, some regulated utilities face challenges in meeting future capital financing needs. It is important that regulated utilities and their commissions implement effective financing strategies. The failure to obtain adequate capital financing may have a detrimental effect on the overall financial viability of the utility, as well as impede compliance with environmental legislation and satisfying changing water customer needs.

Research Focus

This report begins with an examination of the various risks faced by the water industry as well the risks confronting individual water utilities. The research then reviews:

- Several financing mechanisms for capital improvements,
- Financing mechanisms employed by publicly owned utilities,
- Impediments to effective capital financing of water supply, and
- The role of regulatory commissions and regulatory oversight in capital financing.

The implications for the financing of capital improvements created by recent trends in the water industry are explored. Specifically, these trends are:

- The increased emphasis on conservation,
- The emerging potential for competition,
- Increased system bypass,
- The trend toward privatization, and
- Consolidation or regionalization.

The equity or fairness issues associated with the capital financing of water supply are also addressed.

Water utility capital expenditures are generally classified into three categories: (1) routine replacement of existing plant; (2) routine or normal improvements; and (3) major capital replacements, extensions, and improvements. Since the first two categories are generally financed by utility rate revenues, the focus in this research is on financing major capital investment in water supply.

Water Industry

The water industry in the United States is highly capital intensive, capital intensity being measured by capital investment per customer. There is some evidence that this capital intensiveness may be increasing.[3] The increasing capital intensity ensures that the financing of capital improvements will continue to be an ongoing challenge. For example, the delivery of water requires substantial capital investment in both transmission and distribution facilities.

Water supply facilities tend to have long service lives, which mandates the need for long-term investment planning. In this context, large ("lumpy") increments of capital investment are required at times to replace aging facilities and to take advantage of economies of scale. In addition, a certain amount of capital investment is necessary to provide reliable service. In many cases, due to construction economies it is more cost effective to add large increments of capacity rather than small successive increments to achieve the same result.[4] Since water supply capacity is generally added in large increments, the result can be intermittent periods of capacity underutilization. This underutilization of capacity (presumed to be temporary) can create financial problems for

[3] Janice A. Beecher, *The Water Industry Compared: Structural, Regulatory, and Strategic Issues for Utilities in a Changing Context*. Report prepared for the National Association of Water Companies, September 1998.

[4] Ibid.

the water utility.[5] In brief, there can be a mismatching of incurred costs and revenue flows resulting in inadequate cost recovery.

For most water utilities, capital costs are increasing in order to satisfy the need for replacing aging system infrastructure, comply with the quality requirements associated with the amended Safe Drinking Water Act, and meet the increasing demands associated with expanding service territories. An important issue in water supply is future capital costs. Given that water is a limited resource, the incremental capital cost as well as the incremental operating cost of new sources of supply is anticipated to increase over time. In the future, the incremental capital cost and incremental operating cost of conventional sources will be compared with the capital and operating costs avoided through conservation and unconventional sources such as water reuse, desalinization, and treated wastewater.

There are several factors that may partially mitigate the future financing challenges of water utilities. Both aggregate demand for municipal water and per capita use are relatively stable. Thus, growth in water demand is generally limited to that associated with expanding service territories. However, this condition exacerbates the cost and scale problems of small water utilities. Another mitigating factor is that, except for small rural systems, most utilities do not provide service to widely dispersed populations.

The important contrasts in capital financing for water utilities are between (1) small and large utilities of all ownership forms, (2) small and large investor-owned utilities, (3) publicly owned and investor-owned utilities, (4) utilities regulated by state commissions and nonregulated utilities [mostly publicly owned or municipally owned, and (5) conventional financing (debt and equity financing) versus nonconventional financing.

It is instructive to note that the capital financing problems in the United States are somewhat unique. In both developed and developing countries, the dominant form of ownership is state-owned or publicly owned water utilities. Privatization in developed countries, except for the United Kingdom, has had little impact on the ownership mix.

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[5] Janice A. Beecher, "PUC 2000: The Water Industry." *NAWC Water* 36 (Summer 1995): 34-43.

Thus, capital financing of water systems in many countries comes from the general revenues of the state. Furthermore, few countries attempt to recover capital costs from water users.[6] In addition, few countries include asset replacement or depreciation expense in the computation of operating costs. The exceptions are Australia and Brazil which recently began to recover a portion of capital costs from users.

In any research on capital financing, it is appropriate to acknowledge the risks associated with the water industry.[7] These risks include business risk, financial risk, and regulatory risk. Conventional wisdom indicates that the water industry has many characteristics which make it less financially risky than investment in other public utility sectors. For example, competition is limited and the service is relatively insensitive to business cycles. The water industry does face substantial regulatory risk from both environmental and rate regulation. In fact, regulatory risk may be the most important risk element, particularly if regulators base policy more on political than on economic considerations. Risks specific to individual water utilities are discussed in the second section of the report.

Report Structure

The second section focuses on two mechanisms for financing capital improvements in water supply, both of recent vintage and which may be viewed as nonconventional for investor-owned utilities. These mechanisms are availability charges and system development charges. There is also a discussion of some financing mechanisms employed by municipally owned or publicly owned utilities and the impediments to effective capital financing as well as specific strategies for overcoming these financing impediments. The section concludes with an examination of the role of the regulatory commission in effective capital financing for jurisdictional water utilities.

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[6] World Bank, *Water Pricing Experiences: An International Perspective*, Technical Paper No. 386 (Washington, D.C.: The World Bank, 1997).

[7] Office of Water Services, *Setting Price Limits for Water and Sewerage Services* (Birmingham, England: Office of Water Services: February 1998).

The third section of the report focuses on specific financing issues in water supply, such as the effects of conservation and competition. Other issues examined include the financing implications of system bypass, regionalization, and privatization as well as fairness issues associated with financing.

The fourth section presents a summary and conclusions. This overview includes a summary of the financing issues and the role of commissions in promoting effective financing for its jurisdictional water utilities; it ends with the conclusions of the research on capital financing.

Throughout the report, there is discussion of the responses of a panel of financing experts to a series of questions regarding capital financing in the water sector. (The panel members are listed in Appendix B.)

Alternative Financing Mechanisms

Risk and Water Utilities

This section discusses the nature of risk for water utilities, two major alternative financing mechanisms, and the role of a state regulatory commission in capital financing choices. Water utilities, like other public utilities, face three general types of risk: business or market, financial, and regulatory risk.[8] Business risk involves the uncertainties resulting from competition and the operation of the market economy. For example, the potential costs associated with complying with environmental and safety regulations as well as the potential loss of wholesale customers via competition can be categorized as business risk.

Financial risk reflects the uncertainties resulting from utility financing as well as those associated with cost behavior and revenue generation. Thus, revenue risk is a subset of financial risk. For example, the costs associated with the capital structure of the

[8] Janice A. Beecher, Patrick C. Mann, and John D. Stanford, *Meeting Water Utility Revenue Requirements: Financing and Ratemaking Alternatives* (Columbus, Ohio: The National Regulatory Research Institute, 1993).

utility as well as the revenue instability associated with conservation pricing can be categorized as financial risk. Revenue risk, measured for example by the volatility of revenue flows, can also be increased by increased use of commodity rates relative to fixed charges as well as by the implementation of conservation rates.

Regulatory risk involves the uncertainties created by regulatory action. For example, the possible disallowance of operating expenses as well as the possible exclusion of capital expenditures from the ratebase can be categorized as regulatory risk. Thus, regulatory risk is essentially the uncertainty associated with the treatment of costs by regulatory agencies.

A pragmatic way of viewing water utility risk is to examine the elements that constitute or cause risk. These elements include uncertainty and variability.[9] For example, increased uncertainty regarding any aspect of the operations of the water utility, such as its ability to comply with the regulations of the amended Safe Drinking Water Act, means increased perceived risk on the part of both creditors and investors. Similarly, increased variability of water utility revenues (for example, resulting from conservation pricing) or increased variability of supply costs, such as the wholesale cost of purchasing water during drought conditions, means increased perceived risk on the part of creditors and investors. Risk management attempts to minimize the degree of uncertainty and variability in revenues and costs confronting the water utility.

The three types of risk, if perceived to be increasing over time, can translate into higher costs of equity and debt capital for investor-owned water utilities and higher costs of debt capital for publicly owned water utilities.[10] The categories of risk are interrelated. For example, competition in wholesale water markets can increase business and financial risk. In addition, the risk of takeover for both investor-owned and publicly owned utilities is on the increase. This can be viewed as a new form of competition. Financial risk is

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[9] Amatetti, *Meeting Future Financing Needs*.

[10] Beecher, "PUC 2000."

closely aligned with regulatory risk; financial risk can be increased by construction cost inflation and changes in regulatory rules and policies regarding capital expenditures.

Risk is higher for smaller water utilities; risk is also generally higher for water utilities whose common stock is not publicly traded.[11] These two results are not surprising, since utility size and public trading of stock are positively correlated. For example, smaller investor-owned water utilities tend to have higher ratios of equity to total capital and higher costs of capital than larger investor-owned water utilities. A portion of this risk differential between small and large water utilities is a function of the limited market for long-term capital of smaller water utilities. A publicly traded water utility can issue new common stock to achieve balance in its capital structure, that is, reduce its cost of capital. The privately held water utility faces the risk of constrained financing. Water utilities of all sizes face increasing risk from legal proceedings and class action suits, such as those stemming from public health and environmental regulations, or precipitated by the Y2K problem.

The financing options discussed below focus on both financial and regulatory risk. For example, conventional methods of financing such as debt and equity financing generally enhance the ratebase of the investor-owned utility. In contrast, the use of a system development charge may preclude a ratebase increase.

Availability Charges

Dedicated-capacity charges are a relatively new financing method for water utilities. Dedicated-capacity charges have the purpose of recovering costs from customers for capacity constructed primarily for providing service to these specific customers. The availability or readiness-to-serve charge is one type of a dedicated-capacity charge.

The availability charge is a charge designed to recover the costs incurred by a water utility in constructing facilities primarily for the benefit of new or future customers. The availability charge is imposed between the time that service is made available to the

[11] Thomas W. Zepp, "Water Utilities and Risk," *NAWC Water* 40 (Winter 1999): 12-13.

future customer and the time that actual water service is initiated. The availability charge may be based on lot frontage or similar bases. When water service is actually initiated, the availability charge is terminated.

The availability charge may be particularly appropriate in cases where a new housing development is created and the water utility constructs facilities for that development. The initial system costs may exceed the level that can be realistically recovered from the low initial customer base. Thus, it can be argued that it is appropriate that lot owners be charged for having service available, even though at that time they are not actually receiving service. The availability charge is essentially an access charge reflecting the cost of providing consumer access to the water system. Access charges are payments for system access regardless of usage and should recover only the usage-insensitive costs incurred when consumers join the system. The justification for the availability charge is that the water utility incurs certain costs regardless of whether or not consumers receive service.

An advantage of the availability charge is that it promotes cost sharing between existing customers and unconnected property owners who eventually derive benefits from the facilities of the water utility. It adheres to the standard of cost-causation where the water utility has incurred significant capital investment to provide service to both existing and future customers. A problem associated with availability charges that is common to both publicly owned and investor-owned utilities is that of remedies for nonpayment.[12] Since the customer who is being assessed the charge is not connected to the system, termination of service is not an appropriate response to nonpayment. Investor-owned utilities may not have the level of enforcement powers that publicly owned utilities have, thus reducing the attractiveness of availability charges for investor-owned utilities. Other disadvantages of availability charges are discussed below under impediments to capital financing.

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[12] American Water Works Association, *Water Rates and Related Charges*, Manual M26, Second Edition (Denver, Colorado: American Water Works Association, 1996).

System Development Charges

Periodically, water utilities incur capital expenditures for system improvements. Regulators must decide which capital costs are more appropriately recovered by increased commodity rates and which are more appropriately recovered by fixed charges. If the capital investment is oriented toward serving demand growth caused by the addition of new customers rather than toward benefitting existing customers, it is inefficient to recover these capital costs from existing customers. An appropriate financing option is the front-end capital payment or capital contribution, that is, a payment by new customers to recover the capital investment required to provide service to the new customers. The rationale for the front-end charge is to require new customers to finance system improvements that directly benefit them and are largely a result of demand growth caused by the new customers.

One type of front-end charge is the system development charge. This is a one-time charge to new customers when they are connected to the water system. These charges are also known as system capacity charges, impact fees, system buy-in charges, and facilities charges. Generally, these charges are paid by the developer at the time the new customer connects to the water system. The developer in turn passes the expenditure onto the purchaser or the new customer through the cost of the new home.[13] As a result, many developers and home builders' associations have opposed system development charges, since they initially pay the charge which adds to the cost of housing construction.[14]

If used, the system development charge should be limited to recovering capital expenditures for new distribution facilities required by the projected demands of new customers; the system development charge is not appropriate for recovering operating costs. A system development charge ensures that rates for existing customers need not be increased to recover the costs of facilities that have been constructed for new

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[13] Jerome B. Gilbert, "EBMUD's System Capacity Charge," *Capital Financing* (Denver, Colorado: American Water Works Association, June 1990), 33-46.

[14] David B. LaFrance, "Growth and Conservation: Should the HBA Pay its Way," *Proceedings of CONSERV99* (Monterey, California: February 1999).

customers. In fact, system development charges can even have the effect of lowering rates if they are a significant source of front-end capital.

The merits of the system development charge are several. First, the system development charge can preclude existing customers from having to subsidize the new customers. Second, by requiring the customers who have caused the system growth to pay for that growth, the system development charge can allow the water utility to maintain a common rate schedule for both existing and new customers, which avoids the implementation of vintage rates that distinguish between old and new customers. Third, the system development charge reduces the need for rate increases to accommodate system growth.

The system development charge is an option for financing small investor-owned water utilities if economic growth is driving system costs. However, many investor-owned water utilities will reject this financing option since the charge does not increase its ratebase and earnings potential. In sum, system development charges are treated similar to capital contributions-in-aid-of-construction (CIAC). Contributed plant is normally excluded from the ratebase of the utility. Thus, neither earnings nor depreciation are allowed on the contributed plant. There are subtle differences between CIAC and system development charges since the latter may include elements that are not equivalent to CIAC, and thus regulators need to consider the possible inclusion of these elements in the ratebase of the investor-owned utility. That is, the system development charge can be used to recover more than the cost of connection and hookup usually covered by CIAC.

At one time, there were tax considerations that made the system development charge somewhat undesirable for investor-owned water utilities.[15] For example, the 1986 Tax Reform Act made capital contributions taxable as income. This part of the tax code

[15] Fred P. Griffith, "System Development Charges: Ten Questions," *Capital Financing* (Denver, Colorado: American Water Works Association, June 1990), 47-50.

was repealed in 1996. In brief, the ratebase effect of system development charges reduces the attractiveness of this financing mechanism for investor-owned utilities.[16]

Capital Financing in the Public Sector

Publicly owned utilities have greater access to public funding sources than do privately owned utilities. An example is the drinking water state revolving funds created by the 1996 amendments to the Safe Drinking Water Act. As Borrows and Simpson indicate, some states do not permit investor-owned utilities to have access to the state revolving funds while other states limit the amount of funds that can be used by privately owned utilities.[17] This, along with other government bond type funding options, allows publicly owned utilities to have lower overall cost of capital than privately owned utilities.

There are several recent capital financing trends in the publicly owned sector. One trend is the increasing reliance on builders and developers to provide revenue to support water system expansion. These revenues come from contributions, impact fees, system capacity charges, and system development charges. System development charges are becoming relatively common.[18] Another trend is the increased reliance on conservation and demand management programs to reduce and/or postpone the need for system expansion and the need for capital financing.[19] A third trend is the increased use of special purpose surcharges to finance both utility operations and routine replacements.

The author asked a panel of experts on water utility financing (see Appendix B), "What financing trends or innovations are emerging in the publicly owned sector that may be transferable to the investor-owned sector?" The panel responses were varied, as

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[16] American Water Works Association, *Water Rates and Related Charges*.

[17] John D. Borrows and Todd Simpson, *The Drinking Water State Revolving Loan Fund: A Guide for Regulatory Commissions* (Columbus, Ohio: The National Regulatory Research Institute, 1997).

[18] LaFrance, "Growth and Conservation."

[19] United States Environmental Protection Agency, *Water Conservation Plan Guidelines* (Washington, D.C.: Environmental Protection Agency, 1998).

shown in Table 1. More use of long-term debt, interim financing and lease financing were among the options mentioned. One panel member noted that the primary financing trend in the publicly owned sector is public-private partnerships of varying types while the primary financing trend in the privately owned sector is consolidation. That is, large investor-owned utilities are acquiring both investor-owned and municipally owned utilities.

TABLE 1

WHAT FINANCING TRENDS OR INNOVATIONS ARE EMERGING IN THE PUBLICLY OWNED SECTOR THAT MAY BE TRANSFERABLE TO THE INVESTOR-OWNED SECTOR?

!	Increasing reliance on long-term debt which allows financing costs to more closely match the investment benefit stream.
!	Use of more long-term debt to replace equity financing since some privately owned utilities are under debt capitalized.
!	Increased flexibility in the use of short-term debt which allows utilities to reduce risk.
!	Use of rate stabilization and capital reserve funds where large future capital requirements are projected, which increases bond ratings and lowers the cost of capital.
!	Increased use of lease financing.
!	Use of short-term interim financing, which in some cases defers interest payment until the issuance of long-term financing.
!	Funding of a portion of infrastructure replacement from current revenues, similar to publicly owned utilities, as opposed to conventional equity and debt financing, thus saving dividend and interest costs.
!	Use of special surcharges, for example, a distribution improvement charge, to finance capital improvements.

Source: Panel of Financing Experts.

Impediments to Capital Financing

The rationale for the availability charge is substantially reduced in cases where a developer has provided (contributed) the distribution system infrastructure. In some cases, the availability charge may not have a rational costing basis. For example, the availability charge could include usage-sensitive costs such as operating costs that are unrelated to the potential connection of the new customer. In addition, regulators and consumers may strongly question the fairness of a charge for service not actually being rendered. Finally, there is the problem of establishing a mechanism for forcing the property owner to pay the availability charge. For example, it is difficult to identify future customers, who may not be determined until the lot is sold and/or service is initiated. For these reasons, the availability charge has had limited implementation in the water industry.

There are also problems associated with system development charges. First, in relying on the charge to satisfy current revenue requirements, there is the potential for revenue instability since these front-end charges are tied to system growth which will fluctuate depending upon both local and national economic conditions. Second, system development charges can be inefficient by having a noncost basis, perhaps being set equal to charges in adjacent communities. A cost-based system development charge should be based on the unit cost of capacity incurred by the utility and the amount of capacity demanded by new customers. While relatively simple in concept, the system development charge is somewhat complicated in its determination.[20]

Third, the system development charge is more controversial when used to recover the cost of new facilities jointly used by new and existing customers; it is more appropriate to limit the charge to recovering the cost of facilities constructed for the exclusive benefit of new customers. The system development charge in its varying forms has been more widely implemented in the water industry than has the availability charge. For example, Denver Water has recently implemented a new set of system development charges for residential customers that are based on property or lot size. Thus, these charges tend to

[20] LaFrance, "Growth and Conservation."

reflect the concept of value-of-service pricing. The Denver charge includes a fixed fee based on the cost of capacity necessary for domestic or indoor usage, plus a charge per square foot of the lot for outdoor usage. Finally, as indicated above, the system development charge has been implemented widely among publicly owned utilities, but not among investor-owned utilities, given its lack of contribution to ratebase.

The Role of Regulatory Commissions

Public utility regulation can affect capital financing choices both directly and indirectly. Regulatory lag associated with the rate setting process can destabilize revenue and increase the financial risk for water utilities. Thus, expedited rate proceedings and a preapproval process for capital expenditures are some potential ways for regulators to lower financial and regulatory risk. For example, investor-owned utilities may be reluctant to incur costs for conservation and demand-side management programs if there is uncertainty as to whether these capital expenditures are recoverable, either by inclusion as operating costs or in the ratebase. Expenditure preapproval decreases this uncertainty and the financial risk associated with these capital expenditures.

The use of availability charges and system development charges in financing capital improvements in water supply exemplifies the notion that capital financing cannot be separated from rate design in the regulatory process. These special charges, given their particular design, can have numerous effects including those on capital requirements and system expansion.

The appropriate role of a regulatory commission if it wishes to allow availability charges is relatively simple: The commission needs to ensure that the availability charge has a logical costing basis. For example, the commission needs to ensure that the availability charge does not include operating costs that are unrelated to the potential connection of new customers. The commission needs to ensure that the availability charge is not recovering costs that are being recovered by other charges or by commodity rates. In addition, regulators need to assist in the education of consumers, many of whom may question the fairness of a charge for service not actually being rendered. Finally, the

commission needs to assist the water utility in establishing a mechanism for inducing the property owner to pay the availability charge.

The appropriate role of regulatory commissions if it wishes to allow system development charges is more complex. First, the commission needs to address the potential for revenue instability since these front-end charges are tied to system growth, and this growth will fluctuate depending upon economic conditions. Second, the commission needs to ensure that the system development charges have a logical or rational cost basis. Third, system development charges may discourage system growth in some cases, for example where they create rate shock for the new customers, and thus preclude the cost savings to the water utility and all of its customers flowing from economies of scale.

Fourth, the commission needs to ensure that system development charges recover only the cost of facilities constructed for the exclusive benefit of new customers and not the cost of new facilities jointly used by new and existing customers. That is, the commission needs to ensure that system development charges recover the capital costs from the beneficiaries of the service and that the charges appropriately allocate the cost of facilities between new and existing customers. Raftelis suggests other criteria that need to be addressed by the commission regarding system development.[21] These criteria are implementation, for example, the cost and consumer reaction, and simplicity, which includes ease of understanding, ease of explanation, ease of future adjustments, and the potential for litigation. Finally, the commission needs to examine and develop incentive mechanisms to induce investor-owned utilities to employ system development charges as a financing option. The necessary incentives could include a gradual phasing out of the ratebase reduction or an increased rate of return on ratebase.

The author asked the panel of capital financing experts the question, ”How can availability charges and system development charges be made attractive financing options for investor-owned water utilities?” They had many suggestions (Table 2).

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[21] George A. Raftelis, *A Comprehensive Guide to Water and Wastewater Finance and Pricing* (Chelsea, Michigan: Lewis Publishing, 1993).

TABLE 2

HOW CAN AVAILABILITY CHARGES AND SYSTEM DEVELOPMENT CHARGES BE MADE ATTRACTIVE FINANCING OPTIONS FOR INVESTOR-OWNED WATER UTILITIES?

- Regulatory policies that reduce regulatory uncertainty.
- Regulatory policies that allow depreciation on contributed capital or front-end charges.
- Regulatory recognition that the utility incurs some costs in providing a “readiness to serve” and thus should recover these costs.
- Regulatory policies that allow ratebase treatment of the capital recovery revenues since the alternative is to recover these capital costs by including the costs in operating costs and recovering them from all ratepayers over time.
- It may be impossible to make these front-end charges more attractive since regulatory commissions view the revenues as contributed capital and thus exclude them from ratebase.
- The charges may not be in the best interest of the investor-owned utility since risk is reduced; that is, consumers are paying for infrastructure upfront, so one can argue that rate of return should be reduced.
- There are too many obstacles to the use of these charges for investor-owned utilities including shifting risk from investors to customers.
- The regulatory problem is that the availability charge involves forced payment for the privilege of owning property absent services being rendered.
- The regulatory problem with availability charges is the trouble that utilities have in collecting the charges.
- System development charges are only viable in service areas experiencing substantial economic growth; system development charges will not be attractive to investor-owned utilities experiencing little growth in their service area.
- In the long-term, debt and equity financing are superior options to both availability and system development charges since they enhance the ratebase and provide better earnings and cash flow potential.
- An important benefit of these charges for small utilities is enhanced cash flow; this benefit may offset, at least in the short-term, the negative effects.

Source: Panel of Financing Experts.

Raftelis identifies criteria that regulatory commissions can employ in evaluating availability charges, system development charges, and other related financing mechanisms.[22] These include fairness, revenue potential, ease of implementation, and simplicity:

- Does the charge or fee recover cost fairly from the beneficiaries of the service?
- Does the charge generate sufficient revenues to satisfy capital requirements?
- Is the charge relatively easy to implement?
- Is the charge relatively easy to explain and modify in the future?
- Does the implementation of the charge negatively impact growth?
- Does the water utility have an incentive to employ the financing option?

The assessment of the appropriateness of the charges will involve tradeoffs among the several criteria.

Regarding the financing of small investor-owned water utilities, the regulatory commission can be proactive in encouraging financial institutions to establish what are termed water trusts.[23] The water trust is designed as a loan pool for small investor-owned utilities. The trust can provide the small utility with medium-term and long-term debt capital. In this context, the regulatory commission has the responsibility of ensuring that the debt financing does not translate into substantial rate increases to cover the debt financing costs.

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[22] Ibid.

[23] Sumner B. Miller and Paul R. McCrary, "The Water Trust: Long Term Debt Financing for Small Water Companies," *Proceedings of the Ninth NARUC Biennial Regulatory Information Conference,* Volume III (Columbus, Ohio: The National Regulatory Research Institute, September 1994), 3-14.

The Missouri Public Service Commission has been proactive in the area of capital financing of small water utilities. The Missouri PSC was instrumental in developing legislation which created a revolving loan program for small investor-owned water and sewer utilities.[24] The loans are limited to small investor-owned utilities with less than 500 customers, are limited to a maximum of $80,000, and must be repaid within five years. Although another state agency is responsible for approving and administering the medium-term loans, the Missouri PSC is responsible for reviewing the loan applications as well as reviewing the financial viability of the participating utilities.

The capacity of a water utility to obtain financing for capital projects requires it to establish creditworthiness regarding capital markets. Establishing and managing creditworthiness is linked to managing risk.[25] Via capacity management the commission can and should be a major player in the minimization of risk for water utilities under its jurisdiction.[26]

Selecting the appropriate financing mechanism for a water utility can be a complicated and comprehensive process. It may be necessary for the commission to seek input not only from the water utility but also from utility customers and financial professionals. This input can be valuable in considering the tradeoffs between financial and nonfinancial factors associated with financing options.

General Trends and Policies Affecting Capital Financing

[24] William L. Sankpill, "Innovative Financing for Water and Sewer Companies," *Proceedings of the Eighth NARUC Biennial Regulatory Information Conference*, Volume IV (Columbus, Ohio: The National Regulatory Research Institute, September 1992), 121-125.

[25] Edward J. Amatetti, "Managing the Financial Condition of a Utility," *American Water Works Association Journal* 86 (April 1994): 176-187.

[26] John D. Wilhelm, *Water Capacity Development and Planning: A Benchmark Guide for Regulatory Commissions* (Columbus, Ohio: The National Regulatory Research Institute, 1999).

Several trends in the water industry have important implications for the financing of capital expenditures. These include the increasing emphasis on conservation, the increasing potential for wholesale competition, the increasing potential for both system bypass and water reuse, the trend toward regionalization, and the continuing trend of privatization. These trends have mixed implications for the financing of water utility facilities. For example, conservation may have a negative impact on financing in the short term but a positive impact in the long term.

Conservation and Financing

Conservation rates affect revenue stability for the water utility and thus its capability of acquiring financing. Conservation water rates have the most substantial impact on more discretionary water usage such as outdoor water consumption. As a result, water revenues are somewhat dependent on weather patterns.[27] An important point is that water utilities and their regulators need to develop coping strategies to manage the risk of revenue volatility and instability associated with some forms of conservation pricing. However, one could argue that conservation pricing and other conservation strategies reduce revenue volatility in the long-term, with the exception of occasional droughts.

Changes in demand patterns cause revenue variability and affect the cost and feasibility of financing options. The degree of revenue volatility is partly a result of rate design. For example, the increasing-block rate structure often adopted as a conservation tool amplifies revenue variability. In contrast, the traditional declining-block rate schedule tends to decrease revenue variability. While conservation rates can postpone or even permanently preclude expensive expansion of system facilities, a positive long-term financing effect of conservation, it is suggested that regulators examine the revenue volatility aspect of conservation rates. Revenue instability causes increased borrowing costs, more complicated long-term system planning, as well as political and regulatory

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[27] Washington State Department of Health, *Overview of Conservation-Oriented Rate Structures for Public Water Systems* (Olympia, Washington, Washington State Department of Health, April 1995).

problems. If the volatility dimension is not addressed, the financing prospects for the utility can be harmed and the financial risk confronting the water utility can be increased.

Several managerial strategies have been suggested regarding the revenue instability induced by conservation rates.[28] The coping strategies include more frequent rate adjustments, the creation of a contingency (rate stabilization) fund, the inclusion of a safety margin in the determination of revenue requirements, and the development of an automatic rate adjustment mechanism. The key to the success of these coping strategies is the quantification of the short-term and long-term effects of the conservation rate structure. Quantification includes the simulation of revenues under different climatic conditions. The quantification of the revenue volatility associated with a conservation rate structure can be the basis for making more frequent rate adjustments, the creation of a contingency or reserve fund, the inclusion of a risk margin in revenue requirements, and the development of an automatic rate adjustment mechanism.

Again, conservation activities can enhance revenue stability in the long term by making usage less sensitive to weather patterns. At the same time, conservation activities reduce the risk associated with underutilized system capacity.

In brief, the risk of revenue instability increases with the implementation of conservation rates, at least in the short term. However, improved planning and better rate design can decrease the magnitude of revenue instability.[29] In addition, the possible mismatch of costs and revenues can be addressed via rate adjustment mechanisms and the development of contingency funds.

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[28] Thomas W. Chestnutt, Casey McSpadden, and John Christianson, "Revenue Instability Induced by Conservation Rates," *American Water Works Association Journal* 88 (January 1996): 52-63.

[29] Thomas W. Chestnutt, Janice A. Beecher, Patrick C. Mann, et al., *Designing, Evaluating, and Implementing Conservation Rate Structures*. Handbook sponsored by the California Urban Water Conservation Council, July 1997.

A 1994 survey of state commissions found that few commissions had implemented methods to address the impact of water conservation activities on revenue stability.[30] This is perplexing since a number of commissions had initiated measures for dealing with the revenue consequences of energy conservation. The revenue stability measures implemented for water utilities include special charges, phase-in plans, adjustments in subsequent rate cases, rate stabilization reserves, and automatic annual surcharges.

Competition and Financing

Any increase in competition, even of the limited variety such as wholesale competition, increases uncertainty and thus increases the financial risk facing the regulated water utility. This increase in financial risk can preclude some financing options for the regulated utility and increase the cost of others.

For example, assume the following scenario for a small investor-owned water utility. The water utility serves a mixture of residential and commercial users, and one large industrial user constituting 25 percent of total usage. This large user contracts to be supplied by a nearby municipally owned water utility which agrees to finance the pipeline necessary to provide service to this large user. This switch in supply sources will have a devastating financial effect on the regulated water utility. Even if the investor-owned water utility is successful in retaining the large user, for example by reducing its rates, the long-term effect is increased uncertainty and increased financial risk for the regulated water utility. Furthermore, the rate reduction for the large user can translate into higher rates for the commercial and residential users. The rate increase effect on usage, that is, the existence of price elasticity of demand, is another factor which increases uncertainty and financial risk for the regulated water utility.

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[30] Janice A. Beecher, Patrick C. Mann, Youssef Hegazy, and John D. Stanford, *Revenue Effects of Water Conservation and Conservation Pricing: Issues and Practices* (Columbus, Ohio: The National Regulatory Research Institute, 1994).

Obviously, at the distribution or delivery level, competition in water supply is highly impractical. However, competition in the water industry is emerging in numerous forms.[31] One form involves investor-owned water utilities competing with each other to provide support services to publicly owned water agencies . A second involves direct competition between water utilities seeking to acquire other water utilities, both investor-owned and publicly owned, or seeking to serve new residential and business developments adjacent to their existing service area. A third form involves competition between water utilities regulated by state commissions and nonregulated (mostly publicly owned) water utilities to provide water service to a region. The competition in service contracting, the territorial competition, and the broader competition of privately owned versus publicly owned utilities increases uncertainty and thus increases the financial and regulatory risks confronting regulated utilities.

System Bypass and Financing

System bypass has financial effects similar to that of competition and conservation. Any system bypass, even partial, increases uncertainty and thus increases the financial risk facing the jurisdictional water utility. This increase in financial risk can preclude some financing options for the regulated water utility and increase the cost of other financing options.

For example, assume this scenario for a small investor-owned water utility. Again, the water utility serves a mixture of residential, commercial, and one large industrial user constituting 25 percent of total usage. This large user either opts to resort to self-supply for its industrial use (for example, cooling usage) or implements a series of conservation measures such as recirculation or re-use processes. The effect is a reduction in usage of 50 percent. This bypass or conservation activity has a substantial financial effect on the regulated water utility. Even if the investor-owned water utility is successful in maintaining

[31] Henry M. Duque, "Competition in the Water and Wastewater Industries," *NAWC Water* 38 (Fall 1997): 17-20.

revenues, perhaps by increasing the rates for the residential and commercial users, the long-term effect is increased uncertainty and financial risk for the regulated water utility. Furthermore, the higher rates for the other users, given the price elasticity effect, is another factor which increases uncertainty and financial risk for the regulated water utility.

Regionalization and Financing

Regionalization and/or consolidation constitutes an important change in the manner that water services are provided. In addition to the potential efficiencies in both operation and capacity planning, regionalization has important implications for the financing of capital expenditures. Regionalization mitigates some of the financing obstacles for water utilities. For example, more financing options are available to the larger consolidated water utility than are generally available to the several smaller water utilities prior to consolidation. Regionalization, consolidation, or merger/acquisition can be the solution to the problem of small water systems in financing capital investment to replace aging infrastructure, comply with the amended Safe Drinking Water Act, or facilitate the development of regional water supplies.

More specifically, regionalization allows capital to be diverted or freed up in small water systems. This capital can than be deployed to improve delivery system infrastructure.[32] Similarly, regionalization can free up the bonding capacity of small municipalities. Regionalization can make small, financially nonviable water utilities into viable water firms. In brief, regionalization can solve, in part, the nonviability problem for small water systems as well as improve operational efficiency and compliance with environmental regulations.[33]

Privatization and Financing

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[32] William L. Sankpill and James A. Merciel, "Regionalization/Consolidation of Water Systems in Missouri," *NAWC Water* 36 (Spring 1995): 22-23.

[33] Janice A. Beecher, *The Regionalization of Water Utilities* (Columbus, Ohio: The National Regulatory Research Institute, 1996).

Privatization involves private ownership and/or operation of facilities for providing public services. Traditionally, under a privatization arrangement, publicly owned water and wastewater utilities have turned to the private sector to attain cost-effective delivery of service.[34]

There are several financing aspects to privatization. One approach is the traditional agreement in which the private firm is involved in all aspects of facility operation. The private firm designs, constructs, and operates the water facility and then sells the water to the publicly owned (or investor-owned) utility at a negotiated wholesale rate. An alternative approach is a sale with an operating contract in which the water utility sells a previously constructed facility to the private firm, which then operates the facility much as if there is a full-service agreement.

There are many advantages to privatization. The primary ones in the context of this research are the savings in construction and operating costs, increased operational efficiency, and reduced risk in construction and operation for either the publicly owned water utility or the small investor-owned water utility.

For example, the various forms of privatization can be applied to both publicly owned and privately owned water utilities.[35] Each form of privatization can have positive effects on financing costs and risks facing the individual water utility. The water utility can be acquired outright by a private firm. The water utility can permit the private firm to construct and operate system facilities (e.g., treatment plant). Or the water utility can select a private firm to provide operating and other support services (operational outsourcing). However, privatization by operating contract does not necessarily bring capital to satisfy the financial needs of the water utility. That is, privatization via contracts may improve efficiency but does not help obtain private sector financing. In this context, privatization can mean competition for capital via different solutions for future supply. For example, it

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[34] Amy Shanker and Len Rodman, "Public-Private Partnerships," *American Water Works Association Journal* 88 (April 1996): 102-107.

[35] Robert W. Poole, "Privatization and Public Utilities," *NAWC Water* 36 (Winter 1995): 26-33.

provides the small privately owned utility with a choice among building a facility, and possibly having another private firm operate it; having the private firm both build and operate the facility; or purchasing capacity or water from another utility.

In sum, privatization or outsourcing can be a means by which a public agency or an investor-owned utility solves its financing problems. However, there are some impediments to the privatization of water supply facilities in the United States. Privatizers generally do not desire to be subjected to rate regulation. Thus, privatization agreements are often structured so that the privatizer is outside the jurisdiction of the regulatory commission.

To avoid this conflict, a commission could encourage larger investor-owned utilities under their jurisdiction, instead of nonjurisdictional private firms, to engage in privatization regarding the smaller investor-owned water utilities in their jurisdiction. Most of the larger investor-owned water utilities in the United States are actively engaging in both privatization and regionalization activities primarily via the acquisition of water systems of both ownership types.[36]

According to some, a counterpart to privatization can also be a financing strategy, particularly for small investor-owned water utilities having difficulty obtaining access to the capital markets. This counterpart is the conversion of investor-owned water utilities to public water authorities or the acquisition of investor-owned water utilities by municipally owned or publicly owned water utilities. Given the issuance of additional Safe Drinking Water Act regulations, this somewhat controversial form of capital financing may prove to be more salient in the future.

The acquisition of investor-owned utilities by municipally owned utilities generally involves fewer complications than the transferring of assets of investor-owned utilities to a newly formed public water district or water authority. However, it is questionable whether a commission can play a major role in influencing either the terms of the acquisition or the organization of the water authority.

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[36] Janice A. Beecher, G. Richard Dreese, and John D. Stanford, *Regulatory Implications of Water and Wastewater Utility Privatization* (Columbus, Ohio: The National Regulatory Research Institute, 1995).

As a last resort, the regulated water utility could utilize a nonconventional financing option such as lease financing. Lease financing can be a viable option if the investor-owned water utility seeks to limit its long-term debt as well as prevent the dilution of its common stock. That is, when the issuance of additional debt or equity is viewed as undesirable, leasing and similar financing techniques emerge as alternative capital financing mechanisms.

The author asked the panel of financing experts the question: "Are public-private and private-private partnerships a realistic solution to the financing problems of small investor-owned water utilities? The panel responses are reported in Table 3. One panelist suggested that utilities of all ownership types might well examine the various

TABLE 3

ARE PUBLIC-PRIVATE AND PRIVATE-PRIVATE PARTNERSHIPS A REALISTIC SOLUTION TO THE FINANCING PROBLEMS OF SMALL INVESTOR-OWNED WATER UTILITIES?

!	Changing system costs are making some small utilities uneconomic entities.
!	Any large utility, public or private, which could take over a smaller utility and achieve economies of scale would produce a beneficial result.
!	There are numerous cases where private-private "teaming arrangements" have been employed successfully to complete specific projects.
!	The trend in the United States is the municipal acquisition of investor-owned utilities rather than the private acquisition of investor-owned utilities.
!	There are numerous opportunities for both public-private and private-private collaboration; examples include joint facilities, privatization, outsourcing, and joint metering and billing.
!	Utilities of all ownership types need to examine the various forms of collaboration that could reduce average unit costs.
!	The large private utility is more interested in ownership than in debt financing and many small utilities would be wary of other privately owned utilities as a financing partner, due to the fear of acquisition.

Source: Panel of Financing Experts.

forms of public-private collaboration that could reduce average unit costs. Others also emphasized these opportunities. Finally, one panel member noted that private-private partnerships make sense in only a limited set of cases since in their opinion acquisition is a preferable approach to the financing problems of small water utilities.

Efficiency Versus Equity in Financing

As in rate regulation, the concept of fairness in capital financing cannot be analyzed in isolation from the concept of efficiency. For example, the pursuit of efficiency in utility regulation can produce actions that are viewed by the public as unfair or inequitable. As Zajac indicated, economic efficiency does not necessarily conform to intuitive notions of fairness and equity; as a result, he argues that economic efficiency should be viewed as a necessary but not a sufficient condition for fairness.[37]

The difficulty in having a meaningful debate over the question of fairness in utility regulation lies in the multiple perceptions of fairness and unfairness.[38] Some consumers may feel that it is unfair to have to pay for services such as water. Other consumers may feel utilities should not receive a profit (including the cost of capital) from providing essential utility services. Other consumers may believe that it is unfair to be charged for service not yet received such as through an availability charge. Retirees may think it is unfair to expand the water system to accommodate commercial development. The different perceptions of fairness associated with the different stakeholders in the regulatory process forces regulators to engage in a delicate balancing act in utility rate-setting and capital financing.

Although somewhat intertwined, equity and efficiency are separable. That is, efficient financing schemes such as availability and system development charges may be perceived by many consumers as unfair. However, with regulatory commission input, it is

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[37] Edward E. Zajac, *Political Economy of Fairness*, (Cambridge, Massachusetts: MIT Press, 1995).

[38] Janice A. Beecher and Patrick C. Mann, "Equity, Fairness, and Conservation Rates," *CONSERV99 Proceedings* (Monterey, California: February 1999).

possible to design financing mechanisms that satisfy both fairness and efficiency criteria. For example, the capital financing mechanism employed by the water utility must assure in general that each generation of customers pays for facilities that they require and does not pay for facilities required by other generations of customers.[39] That is, the financing plan must satisfy intergenerational equity standards by matching the cost impact on consumers with the benefits received by these consumers. Financing options must be subjected to the criterion of achieving intergenerational equity.

The system development charge is an example of a financing mechanism that satisfies both efficiency and equity criteria. The system development charge adheres to the cost-causation standard by requiring new customers to finance system improvements that directly benefit the new customers and that are a result of the demand caused by the new customers. In addition, system development charges are equitable because they avoid bond financing of the expansion facilities. If conventional debt financing was used to finance the full cost of expansion, debt service cost recovery would result in rate increases; thus existing customers would be subsidizing demand growth.[40]

Summary and Conclusions

Many regulated water utilities face the challenges of capital financing. It is important that regulated water utilities and their commissions implement effective financing strategies. The failure of regulated utilities to obtain capital financing in a timely manner will have a detrimental effect on their financial viability.

The water industry in the United States is highly capital intensive. This insures that the financing of capital improvements will continue to be a problem in the future. In addition, water supply facilities tend to have long service lives, which mandates the need for long-term capacity planning. In this context, large, ”lumpy” increments of

[39] Raftelis, *A Comprehensive Guide*.

[40] Ibid.

capital investment are required to replace aging facilities, take advantage of economies of scale, and provide reliable water service. The result can be intermittent periods of capacity underutilization. This underutilization of capacity can create financial problems for the water utility, primarily via inadequate cost recovery.

An important issue in water supply is future capital costs. Given that water is a limited resource, the incremental capital and operating costs of new supply sources is anticipated to increase over time. Regulators and their jurisdictional utilities are advised to compare the incremental costs of conventional sources with the incremental costs to be avoided under both conservation and water re-use. Regulators and their jurisdictional utilities will also want to compare the incremental costs of conventional supply sources with the incremental costs of desalinization and treated wastewater facilities.

Regulatory Oversight

As indicated by Kaloko, regulatory commissions must assume an important role in addressing the financing problems of jurisdictional water utilities.[41] The regulatory environment, which includes both the policies and practices of commissions and the perceptions of the participants in the capital markets, can affect the scope of financing alternatives and the level of financing costs for regulated water utilities. The regulatory solutions to the financial problems of jurisdictional water utilities involve both regulatory oversight and the ratesetting process.

There are several regulatory oversight strategies appropriate for mitigating capital financing problems. First, commissions can encourage and assist in the consolidation of water utilities, as well as promote their acquisition by both investor-owned and publicly owned utilities. Second, commissions can assist in establishing mechanisms such as water trusts for infusing capital into the regulated utilities. Third, commissions can have regulated utilities evaluate alternative sources of supply, including interconnection with

[41] Ahmed Kaloko, "The Financial Challenge for Water Utilities," *Proceedings of the Ninth NARUC Biennial Regulatory Information Conference*, Volume III (Columbus, Ohio: The National Regulatory Research Institute, September 1994), 33-48.

other water utilities. Finally, commissions can develop and implement alternative financing mechanisms, such as availability charges and system development charges.

Regarding rate regulation, there are several regulatory strategies appropriate for mitigating the capital financing problems. Commissions can continue the process of simplifying rate fillings for small utilities. They can consider shorter depreciation periods for water plant investment. Commissions can develop incentive mechanisms for adopting alternative financing mechanisms by jurisdictional utilities. They can approve fees and surcharges, such as an infrastructure replacement surcharge which replaces conventional debt and equity financing.

Finally, commissions can be proactive in analyzing or evaluating financing options. The analyses by commissions can indicate the consequences of the options and clarify the associated tradeoffs. The commission analyses can be both qualitative and quantitative. That is, the evaluation methods can vary from highly quantitative to highly qualitative, or somewhere in between. The benefits of commission evaluations of financing options include improved decision-making, decreased financial risk and uncertainty, and the avoidance of unanticipated outcomes.

Several criteria used for evaluating rate design can possibly be applied to evaluating capital financing alternatives.[42] The criteria include:

- How well does the financing mechanism promote resource efficiency?
- How well does the financing mechanism promote cost efficiency?
- How well does the financing mechanism assure financial viability?
- How well does the financing mechanism provide revenue stability?
- How understandable is the financing mechanism to the various stakeholders?

[42] Beecher, Mann, and Stanford, *Meeting Water Utility Revenue Requirements*.

- How well does the financing mechanism minimize intergenerational inequities?
- How difficult is it to implement the financing mechanism?

These criteria can assist commissions in evaluating and choosing among financing alternatives.

Again, the ability of the regulated water utility to acquire the necessary financing of capital facilities is a function of its ability to convince the capital markets of its creditworthiness. This requires that utility managers be more cognizant of the factors that affect financial performance and risk, for example, drinking water regulations, unstable revenues, and rate shock. Commissions obviously can play a major role in assisting the utility in managing risk and improving financial performance.

The author asked the panel of financing experts a final question: "What are the most important policies that a regulatory commission could implement to assist small investor-owned water utilities in obtaining capital financing?" See Table 4 for the responses. The main theme implicit in the comments is that regulators should provide a more flexible rate regulatory process in which the conventional adversarial atmosphere is replaced by a more cooperative partnership environment.

Conclusions

There are several conclusions that can be drawn from this analysis of the capital financing of water supply.

- Investor-owned utilities need to explore and evaluate financing mechanisms such as availability charges and system development charges, even though there are impediments to adopting these alternative financing mechanisms. The regulated utilities must be able to justify the alternative approaches to capital financing.
- Several recent trends in the water industry including system bypass, wholesale competition, and conservation have important implications for the

capital financing of water utilities. These trends present challenges to water utilities seeking capital financing.

- Regulatory commissions can play an important role in addressing the capital financing problems of jurisdictional water utilities. The commission role can involve both regulatory oversight and the ratemaking process.

TABLE 4

WHAT ARE THE MOST IMPORTANT POLICIES A REGULATORY COMMISSION COULD IMPLEMENT TO ASSIST SMALL INVESTOR-OWNED WATER UTILITIES IN OBTAINING CAPITAL FINANCING?

- The regulatory commission should promote debt or capital pooling so that small water utilities can gain access to the capital markets.
- The regulatory commission should work with the agency responsible for state revolving funds to allow small investor-owned utilities access to these funds.
- Regulators must recognize the need for advance funding tools (allowing rate recovery in advance of capital needs) using mechanisms such as capital reserve funds and rate stabilization funds to obtain higher bond ratings and reduced financing costs.
- The commission should consider alternative approaches to ratebase regulation such as the cash basis that is used in the rate regulation of government-owned utilities.
- The regulatory commission should assist the utility in offering assurance to potential lenders that revenues will be generated to repay the debt such as establishing a dedicated capital funding account.
- The regulatory agency should adopt more flexible policies and provide incentives for the investor-owned utility to seek capital financing.
- Regulators should decide small rate cases quickly and consistently and have a small staff that specializes in small water utility cases.
- Regulators should encourage small systems to participate in financing consortiums, resulting in lower capital costs.
- The regulatory agency should encourage the acquisition of small utilities.

Source: Panel of Financing Experts.

This report does not present a specific analytic method for selecting the best mechanism (or mechanisms) for financing capital investment in water supply. In the opinion of the author, no evaluation technique can replace informed judgment in making this selection. Regulators must be open to the consideration of alternative financing methods while at the same remaining vigilant about their application.

APPENDIX A

GLOSSARY

AVAILABILITY CHARGE. A charge that is imposed on property owners between the time at which water service is made available to the property and the time when the customer connects to the system and begins receiving service. The availability charge is also known as a dedicated capacity charge.

EQUITY. Equity (an objective concept) and fairness (a subjective concept) are related. Rates and financing methods are fair when perceived by consumers as not providing an unjust advantage to any group of customers. Rates and financing methods are equitable if there is equal treatment of equally situated customers and unequal treatment of unequally situated customers.

INVESTOR-OWNED UTILITY. A utility that is owned by an individual, partnership, or corporation, with equity provided by shareholders. Investor-owned water utilities are subject to regulation by state utility commissions and thus are referred to as jurisdictional utilities.

PRICE ELASTICITY. Price elasticity of demand measures the sensitivity of usage to changes in price. More technically, price elasticity is the ratio of the percentage change in usage in response to a percentage change in price. Estimating price elasticity is an important component of revenue forecasting and water rate design.

PRIVATIZATION. The shifting all or some of the operational or ownership responsibilities from the public sector to the private sector. If this activity shifting only involves a contract between a private firm and an investor-owned utility, it is more appropriately termed as outsourcing.

PUBLICLY OWNED UTILITY. A utility that is created by legislative action of a state or other government agency. A publicly owned utility may be part of municipal government, county government, or regional authority. Publicly owned water utilities are generally not subject to regulation by state public utility commissions.

GLOSSARY, Cont.

REVENUE STABILITY. Revenue stability involves the pattern of revenues from a specific revenue source. Some revenue sources generate revenues in a consistent pattern; other revenue sources generate erratic or unstable revenue flows. For example, fixed water charges provide more stable revenues than commodity charges. Revenue instability can result from conservation rates.

RISK. The exposure of a firm and its investors to the possibility of profit or loss. Risk is increased by increased uncertainty as well as by increased variability of utility costs and revenues. Risks confronting water utilities include business or market risk, financial risk, and regulatory risk.

SYSTEM DEVELOPMENT CHARGE. A contribution of capital for the purpose of financing either recently completed facilities or planned future facilities required to meet the demands of new customers. These charges (also known as impact fees, and capacity fees) are imposed on builders and developers and have the purpose of financing the capital improvements necessary to serve new system customers.

APPENDIX B

PANEL OF FINANCING EXPERTS

Tim Barbee, Assistant Director of Utilities, City of Arlington, Arlington, Texas

Janice A. Beecher, Beecher Policy Research, Inc., Indianapolis, Indiana

James M. Burke, Bureau Economist, Portland Water Bureau, Portland, Oregon

Thomas Catlin, Exeter Associates, Silver Spring, Maryland

Thomas W. Chestnutt, President, A&N Technical Services, Encinitas, California

Jeffrey S. DeWitt, Deputy Finance Director, Phoenix Finance Department, Phoenix, Arizona

David B. LaFrance, Director of Finance, Denver Water, Denver, Colorado

J. Rowe McKinley, Vice-President, Black & Veatch, Kansas City, Missouri

Eric Rothstein, Senior Economist, CH2M Hill, Austin, Texas

Scott J. Rubin, Public Utility Consulting, Selinsgrove, Pennsylvania

Arthur Sirkin, Consultant Administrator, Flagler County Utility Regulatory Interim Authority, Bunnell, Florida

John D. Williams, Chief, Policy Development, Florida Public Service Commission, Tallahassee, Florida

Christopher P.N. Woodcock, President, Woodcock & Associates, Wayland, Massachusetts

The views and opinions expressed by the participants and listed in tables in this report are not necessarily those of the organization, agencies, or firms employing these individuals, nor do they necessarily represent the views of their past or present clients.

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